Generation 0 population ...

| $\begin{aligned} & 1 \\ & 2 \end{aligned}$ | ( T A C A C A T A T TAGCGTATTATAAATCGCATTTGTGA) |
| :---: | :---: |
| 3 | (GCATTTGCAAAGGGGTCAGTATTGCTCAGGTAGTC) |
| $4$ | (GCTC GTCAACGCTGCGGCCGGACCCAGGGC GC TAA) |
| $5$ | ( $T$ C TGGGACAACAGAGCTCCAAGAGTGGACAGCACA) |
| 6 | (AGTTGAGCTATCGGTGCGATCACATGGGCCCCCCT) |
| $7$ | (TCGGGCAACATAAAGCCGCTTCTGTTGGTTTTACT) |
| $8$ | ( C T T TCAGTATGGTCGCTGCATGAGCGTTAACTGTA) |
| $9$ | (AGGCCCGAAAGGCCGACAGCCGTTGAGCAAGATGT) |
| 10 | (AACCTACGAACCTGCATTGATCAGTTTCTCGGGAT) |
| 11 | (ACGTCAGGAGCGATGGCCCCCGCGA |
| 12 | (TGGTGCCCGGCCCTACCTGCACGGCGCCTGCCTGAC) |
| 13 | ( GGGATTTTTTGGACGATCACTCAACTTTATTGGCT) |
| 14 | (CTCCATACCTCCACATGGGTGAGGCACAACGCTAA) |
| 15 | (TTTATAACTATGTGCAATTACGGTCTGACTAAGCC) |
| 16 | (TCTGCGGAATTATGCGCTAAGACGAAAAATTCTAA) |
| 17 | ( G GA G G G G GACTAATCGATGAGCGCTTGCAGAAGAC) |
| 18 | (ATTCATTGTGTGCCACTCCAAGAGATTTTCAGGG |
| 19 | (A G A T C G A T T G T T A G |
| 20 | (ATA GAGGTTACGGCTTGCACACAGCGCGTAGAGTC) |
| 21 | (AAGGAGTCTCGTATAGCCAGCCGGAGACGACGAGC) |
| 22 | (GCTCCGCCCCATCATCAAATGGAATCGTCGACGTC) |
| 23 | (CCGGCTCTTCCCTGAGACCAGCCTGTTTAATCTGG) |
|  | (GTTCCCATCCACGTGACCACGCAAACTGATTTTGG) |
| 25 | (TAGCTGTCACGAATCAGAAGGCGCACTGTATGAGT) |
| 26 | (CCATGATGCCAAAGCTTAGAGAACT |
| 27 | (CCGATTAGACTCCCGGCTTGTCACGCAATATGTA |
| 28 | (CTGTAAGCGTGCGTGATTAATACTTCCAATAGTAC) |
| 29 | (GGCATAGGTGGCCAAAAACTCATCT |
| 30 | (CATACGGACAGTGTCTCAGCCCTTCAGTTCGCACA) |
| 31 |  |
| 32 | (ACTGGCAGTGTCGTATAACGGGGACCTGAAGGATG) |
| 33 | (CGTATAGATAAAACAAAACCGAGTGGAGATGGAGG) |
| 34 | (A A G A TC T GACTCCTAAGTCCTCTCAAATAGTACCC) |
| 35 | (CCCGTAGGCGGAACCGATGTATGG |
| $36$ | ( A G |
| 37 | (GAGCACGCGCCAATCTAGTAGTGATAGAAACCCCG) |
| 38 | (TCCGGGAAGAATGGGATCTTCGAGTCGATGTTATG) |
| $39$ | (CT G C C T C G T G G A |
| 40 | (TCGCAAATTAAGGACTACGCAAACGGTAGTATGGA) |
| 41 | (TTGCACAAGGGCATCAATGATCGTTGGCACCTTCT) |
| $42$ | (GGAGTATTCCACGGGGGTTGACAGCGGACCTAAG |
| 43 | (ATACCAACATTGCTGGGTTCCGTATTGGTCCCAT |
| 44 | (CCAAGACATAGGTGTTAGATACCGCTTCGCAGCCG) |
| $45$ | (ATCAAGCTGCAGCTACAACCCCTATCTCAGCCACG) |
| 46 | (TCTGTACTCGAAAGCGAAGAGCCGTTTAGGCCTTT) |
| 47 | (GTCTGCTTAAATCGACTCGAGCCGCCAAGCATGGC) |
| 48 | (GGGAAATCGCCGAGCTAGTTCCATTAAGGGAAAAG) |
| 49 | (TGCCAGTGTGACCATAAGCTTTAGGTTTATATATA) |
| 50 | (CTGATGCAGAGATATAGCTATTGCTCTAGTTGGGA) |
| 51 | (GTTCCGCTGGCTGAGAGATCTGCAATTCGGGTCG |
| 52 | (CTTCAAGCAGACTAGACAATTTCATAGTTGAGCAT) |
| 53 | (ACCGACTACAACGTAAACGAAACCGGAAAACTAGT) |
| $54$ | (GCGCCCTCGCACCTATGAGGCCGCTCAATAAGTAC) |
| 55 | (ACTTCTGGAGGCTTCTTGCTGGTGGGGGAGAGGTA) |
| 56 | (GACAAAATTGTTCCTAGAAGGCATGTAGAACTGGC) |
| $57$ | (ACGATGCGCAGATGTCATTCTATGAGTTACTTCCT) |
|  |  |

(GCCTCCGATATCAACGGCGGCGTCGTGGAGTTCCG) (TCTCCACGCTGGACTGTATTTTGCTGTTCATTCAG) (CTTTCTTATAAGCCTATTTGTACGGTTATGTAATT) ( G T C A T C G T T C C TC G T T C T A G T T T T A C G G G G A T G A C) ( $G T T A C T A G G A G C T A G C T A G G A C A C A T G A A G C C G A G)$ (CTCTGTCTCGTCGGGAATCTGAACAGACTACTAAT) (GCATAGTTATGAAAACGCTAACTGACGGCGGCAAT) (C T C A C T A C T T T C A A C T A T C T T T T G A G A C TC G GC C A) ( T T T G C TAC TAGAGTCAGTAATGTTAGTCACGTAAC) (A T G A G C T T T G G A T C G A T T T T A C C G T T C T T T T G A G C) ( T C G G G T GCC GACTTCGTGAGGGCTCAAGGGTAATC) (ACTC G G A G GATTCTGTGCTCACTATCCCCACATAA) (A G C A G G T T T T C G G C C C T C A G T A T C A A G A A A A C C C A) (CAGAAAACTGAGAGGCGCGGTCGGAAAAACATCTC) (C C A C C T GCATAAAGGCAAGATATAGAGTTACAGTT) (A A A T A T GAGATCGAAGACCGCGGGCTTCTGCTGAC) ( $C$ GCCGCCGTTGGTAACAATTGCAACCATACAGTAA) (GTCTGCATCCCAGCGATATCTCGAATGAC GTCATC) (CCTCGGAGTGTCTGCCGGTCGTGGCTGTAGAGTTC) (CTGTA GCAATAGCTGCACCATCATCGCAATACAGT) (TAGATCGGAGACTCGGGTCCCGCGTCCATTTTTGG) ( $G A G G T T G A C A C G T G T G T G A G G T A A A A C G T T C G C T T)$ (A T T A T T ACC G GCAC C G A A T A T C G G G A A CACATGTC) (ACAGCGGCAGTCGGAGGGCTTTACTTGGAATACAC) (GTCC GCTGGCAACATAGCATCCGCGTTACAGTCTT) ( G TACGTAGTCCCCCTGACCTAAGTGTGTCGACTTC) (AGCCT ATAGACTCAAGGCGACTCAGCCTTCTTATA) (TCAGTCCGGCGAAGCTAAACATCTACAACCGTTAA) (CTGCGAAAAGAACGATGGCAGGAGGAGTATACTCG) ( C T C C C G GCCAACAATAGCGCTCCTTACGGGCCGGA) (ACTTTTTGTCAAGTCCCGCAGTGATACTAGCCCGC) (TAAATCTTAGTCTTGTGTTGCCTGTACCCTCCAGG) ( T T G A G C A T C C G T G A T T T C T T G A G C T A C T G A G C A G G) ( G G GAATGTACCTGGCCGATGGAAGACCGGGTATCC) (C TATAAGGCGTAGGGCGAAGTCAACGGTGGGGGGT) (A A TAACTGGAGCATACTATTCTATAACCATGATCG) (T TAGTGAAGTTCAATCGTTAGACCACGGGACTTCG) (A ACGTT GACGAGTCCGCCAACCATTCCGATGAAAG) (A A G T A TACAACCTCTGTCATCGGTTACCAGAATGA) (GCATCTCCTAGCCGCCACTAAAATGCAACTACAGA) ( T GACGCCATTGCCTGAGGTCCATCGAGAGATAAGC) ( $\mathrm{C} A \subset A G C C G A T A A A G A A A C G T T G C T A A T T A G T G A T C)$ (ACGACC GACCCGGACGCCAAAGCAACCTGTCCGGT) (C G G T T G GC GACTAGGGACAGTCTTGC GAGCCATTA) (C G G A A G T C C C T T A A GCGGGCCTGTACTTTGCTTAA) (C GCGGTGGGGGGGGGGAGTCATAAACCAAGGCAGG) (ATTACCCGTCTTAAAAACTAGAACCGTCGGGGTCG) (T T G GC G A G GAAACC GGGGCGCTATTATCGACACTC) (AGAATATGAGGTACCGCTCCTATGACTCGAAAGCG) ( T T G A T T T G T TA G A C G G A C T A T GCTACACATATTTT) (ACCGACCAACGAAGTCACTATGCTGGTATGCGGCC) (TAAACACTTAGCAGGCCTAACCAGCCCCTGTACCG) (GTTCATC GTTTTAGGCTGCGTGGCCTACAAGGACT) (TCCCAGGAGGAATACGAGCCATGGCTGACAGCCGC) (GCTTACGATTCCGGGTCAACTCCTGTAGCTTTCAC) (A A G G T GCAAGTTAGTCCAGCGAACGAAAGGATATA) (GAAATATTGAGCTCAGGCACATTCAGCTCGGCCCG) (GCGGAATTTGTCCTTGATGC GACGAGCTGAGCCTC) (CCCACACACGAGGCATCAGGTAGAGAAAAGCACCA) (GGGTGCCTCGTGTTCTATTTACGTCGGTCAAGATT) ( T G C C A C C A T T C T G G G A C C G G T T A C G G C T C C T T G T T) (GCTTCCTACCGGACTCTTATCGCGCAGAAGAGCAA) (A A GTGCTCACCCTTGTATAAGTGGCGAAACGCCAG) (T TATCAGGACCTGGGGTGCCCAAGGGTAGGGGTTT)
(GGACTATATCTCGGTTGTACTGCAGTCTCAATCCA) (GCGGACAGTGGACCCGAAACAGGTCTGTCGATGAA) (GATAGGCTACAGAGCCTCTGTAGGTTTTGCCAAAT) (GGGTTGTCGGAATGTAGGAAGCCTAGGCGGTGCTG) (A A A A A GT G A A ATAGGTCAGACCTATCATCACGACC) (ATACCTGATTCAGTGGGTTGAACTATGAGCGACAG) (CAGGTCATTCCCGCGGTCAATGGTATCAACTACTA) (CATGATGGAATGCATACAGATTTATTCGTCATCTC) ( T G T A T T A T C G T G C T A C G T G G A T T C A A C A G A A T A T C) (GAATCCCTTGGTTTGACGACTCTGGTGCGGGGGTC) (A A G GCCATGTAGCTGGGAAACCGCGGATATGCCGC) (GAATCAACTCTCACTCAACTTGGGAAGGCTTTGCG) (C C A G T C T T GCCTC C A T C G C A G T T G T G G A G C T C A T T) ( $T$ GTCACATTGATTACTGTCCGTACCACTGCAATGG) (GGATC GTGGCGATATAAGGCAAGGCCGGCCTAGCT) (A A ACCCGGCACCATAATTAACGTGCAACAGTGCGC) (GGACGGATCTACACAGTTGGGTCTGAACACACTGC)
(GCCGGTATGTTCAGCAGTGGGTTAGGATTGCCACC)
(GACGTGCAAACAACAATGCTAATCTAGTGTTCCGG)
(A G G G G T A C T G T G A C C C A TATT G G GTTTAACACCTA)
( $G$ TGGAGCCCTGAAAATTACCATTAGCAGATTAGAG)
( $G$ TATCCCAGGCCGCGGGGGCGCTGGGACCGCCTCC)
(GCTT GC G A ACGAGCTCAGTCCTCGATACAACCCCC)
( $G \subset C G G G A A C G G A G A C C A C C A A T G G A T G T C A T G T G A)$
(ACGTGTCTAAGCCGGTAAACCGATAAGACTTGGTT)
(TAAAACAAAGAAATGGGTGGATTTACGGGCTCGGT)
(A A GTAGGCTAGAAGCCCTAACGAAAAGCGCGTACT)
(GTTGGATGATCCTTCGGGACAGCTGTACTGACCGT)
(TACACCTGGCTTTTGCTGTAGCAGTTGGACGCGAT)
(GACTTCCCATGTATGACTTTCTCTCTGTAATTACA)
(CCTGTCTGATTGTTCCATCAGAGTAACCTATAGGC)
(A A G GCGATCGTCACCGGTCTTGCGGGTCACGATGT)
( $C$ GCGGTGCATAGAACTCCATGCCTCTCAGCGGTTT)
( $\mathrm{C} T \mathrm{~T} G \mathrm{C} A \mathrm{GCT} \mathrm{T}$ GAGTAGATCTGGTACTCAAATTAGA)
(ACCTCACCCGGAGTCCTCCTGGGTTTAAGGTTTGC)
( $T$ G AC T T TC G G G G T G T G A G T AC GCGCGGCC GCACTC)
(ATTATGGCCCACATCGTCTGGCTTGTCTCCCGATM)
(GCTGTCTTCGGCGTGGGATGTGATGTCCAATACTC)
(A A A ACTAGCCGCTATTTATCATGGGTCAAGGGTCT)
(ACTCCCCTCATTATGCGGAACCCATCGCCGGCCGA)
( GCCAAGGTGTGGGGCGTTCCGGCATCCCGGATTCC)
( $G A A G G A A A C G T G T G T T G C G A G T C C A C A G G G A A T T A)$
(TCTTCTCTACATTTTTCACGAGTCCGATTAATGGG)
(CGGCCTTGCAGAGCTCCCCAATACACCCAAGGTAA)
( C A G T A A C G T T G A A C C C C C C T C A A A GCC C T GT G A T G)
( C G TCTTAATTAGCTGACGTCATGAGACATTTGAGC)
(GAGTCCCTTACCCGAGCGCCGCACCGCCCGGAGAG)

(CTACCCAGCTTTTTGCAATCCTATCCGATTTATGC)
(A GAGGTGTATTCGAATAAAGAGCGTCGAAGCGCGC)
( $G$ TACCACCTACGAAATCGAAAGTTGGGTCTTATCA)
( $\mathrm{T} A \mathrm{~T} G \mathrm{C}$ G T A A A C A GCGGATGGATTCGTCGTCGTTTA)
(GAGCTGCGAATAACTCTAAATGGTTCAGTTAAGTC)
( G TACGCATCACATACAATCCTGCAGTCAAAAGATA)
(ATGAGTAAACATAAGCCACCAGCGCATACTCGGCG)
(ATGAATTAGATATTTAATAGGGTTATCGGTTCACC)
(C GCT GA GACGGC G G GTCCTATGGGCACC GTGCAAT)
(C G A C GCCCGCTTCCCTTTCCTXCTTCTAATTTATCG)
( $G$ T TA GCTATTGACGATGTCTCAGCCGGCGTCCCTG)
( $\mathrm{C} A C C C C G C A G T G A T A T T T T G C T T C C G T A C G G C G T A)$
(TACTTCAATCAAAGGGCAGATCCGGCATCATTGTT)
( $C$ GCCGGCTCTGGCAAGCCATTAAAAGCAGTAATTT)
(ACT A A A C GC G A GTCA GAACCATGCGTCGGTACTTT)
(TGTTAGGACAGGACAGGAACCCCTGAATCCCCACT) 0
(C GAC GTTGAGGTTTAGCGAAGCCACGACAGGATCA) (A T G G A G A C GACAGTTTGGCTCATACC GTTCTGGCG) (GGATCGCCTGGTCGCATCACTCGCCAATACCAGCA)
(TAGTAGGCTATCGGACGACAGTCTGACAGGCTACG)
(A T G GCACGTCTCTTTGCGTTAACTTCTAGGAGAGT)
(A A T G A ACCCCCTCCTATGAAAGACACAAGGGTCGA)
(GCCAAGTGACTAACACGTGGACATGGAATACTACC)
(TCGCCAAGCCAGCCACGCGCTGTATGGGGAAGAGA)
(TAAGAAGGTTTCTTAGGACACTGCGGGATTTAGCA)
(TTGCCGCCATGTTGCCGCTTCATGCGAGCGAACTCT)
(CCGCACTGGTACTAACTGATAAACCCAGGCGGATT)
(TCCATAATCGACTCTGATTGTGATGTAGTTGTTGA)
(CTCTGAAAACTCATTCGAGATTAATACGAGCCAAC)
(GATAAAGGGGGCTGAGGCAGACTACAGCTTACCAG)
(A A G A A A G G T TC G A A GTACCCCCTTGGTACACCGTG)
(CCAGGTCCGCCTAAATTGCAAGTTTCCATCCGTTT)
( $G$ T T T C G T GCTGGGGGGACAGCGGACCCTCAGTTTG)
(GCTGC GATACGCACAGAAAAACCGTTATGGCTGTT)
( G T G G T G G G GACTCTTATCCCATCGGCGATTCACGC)
(TTCAATAGTTTTACGAGCTCTATGGCCCCCAAGCG)
(ATGACCGAGCAACAGCTCCCCGCAAT TCCGAGAAC)
( $\mathrm{C} T \mathrm{G} G \mathrm{GCA} \mathrm{C}$ GTAATAATAGAGTCTTTAAGTTTAATT)
(CCTTGGTCATCTCTGTCAAACGACACGACTTCATT)
(ATGCA GAAGCTTCAGTGTXGCTTAGGGCGGACCTA)
(A C C G G C C C A T A A T T T T A C A C T C G A A G T GTTCA GTT)
(C GCTA G GACATACGTGCGAGCTTTGCGGCAACGTG)
(GTGCGCAGCAGGATGGTGAAAGTCATGCGCATCCT)
(GGCCAAGCGGGATTAACTCTGACAACAGCATGCTT)
( C C A T TATTATATAGAGGGCGTTACCTCTCCAAATC)
(A GTGGAATCCTGGTGGTACCCGTATTGGTAGAAAC)
( $G T T A A T G T G G A T T G A C A C C G C T T C G A C C C A G C A C T)$
(TGTATGTACCATGCTACACGCGTCTCCTACGTCCG)
( G T G T G A TCTGGGGACAGTTTGCAGGTCCCAGATCG)
(ATGAAGTCAAATCTTAATTCGTTAGGATTAATCGT)
(TCGAGCGTTCAATGATCAGCGAATATTTCCGCCGG)
(TCCACCAGTCCCAATCCTTTAAAAGTACGAAGTGG)
(CACTGTTGATCCGACCGGTCTCGATCACTGCTTAG)
(TGATTGCATCAAGACCGACTCGCAGATACCGGATA)
( $G \subset A G G A G G G A G C A C A C T A T C T C C T A A C C G G C C G A A)$
(T C T C T G T G T A T C C T G C T C TACC C T G T T A C GTTCC G)
(ATCTAGGTATTGGAACCTCTGTCCCGAAGCCTCAC)
(CGTTCTCTCATATCCCAACTATCCCGCTTTCAAGT)
(ATCTCCAACATCCCGCTTGTAGGAGGTACCCATTA)
(CTGCCGTGAGGCCGGAATGGTCGCAAAATCCAACG)
(A T T T G A G G GCGGAGTTAAACTCACTTCGATGATTT)
(CCGTTAAATCTCGCGGGCTAGATATAACACCCGTG)
(TCGTCATGTTGGAAGTAGCACCGTTTCTGCCAACG)
( С C C TA CTACATTCTCAAGAAAGCTGATCCCTACTA)
(ATGCGAGCGCTTCAAATCAACAGTGAGTTCCACCA)
(TTTTGTACCAAGATACGTCTCCTAATACAGAAGAC)
(TACGATAGTCGCAACCAATACCGAGGATTGAAGAT)
(AGCTTTMGTGGATACGAACTTGTTCACCTGGTGAA)
(C TAT T A T G G GAGATCTGGATACTCACC GAATTTCG)
(ACTTCGGTGGCAAATACCTTTTGACAAGTGTCACT)
(ACATTGGCTCTGATGCCGCTCCCGGCCACGTACGA)
(ATTTCCGCTAAGCGAATTAAGAAAATGTTCCCGCA)
(A A GTAGAGATCAACCGGTCCCGAGAAAGAGCTCTT)
(TGATTAGTTGAAATACCTAGGAACGGACTACTGTC)
( G G G GACACGTAAACGAGTGTCCTCACAAACAGCCA)
(A A A G T A C G T GATT GA GTTTGCGCCTCTCTTTTTAT)
(AGCATAC GACTTAGCTATCTTGCACGTACCATTAA)
(AGGTCCTCTGGGCCCACCCACGTATAGGCGAAGAC)
(C G C G T T C G C C TC G G A A C G C C A A G A GC C A TC G A G T C)
(A ATATTCTATAAAGACGTCATAGTCTGCACATGCA)
(T T A C A C T T C C A A C C T G A G G T A A T A A T T C T C A GCAG) (A GCC G G A G A A T C G C A G T A G A GAGTAT G G GACA GAC) (TAGCTGTCCATCCTTTGTCAGACGGCCAAATCTCC) ( GAGACCATTACGACCGGGGGGAAATGAATTTCTTC) (ACTTCACTAGAGTCGATCCTACTCTTAGGCTCGGC) (ACTGTCTGCCTTACCTGTCGGTAGCCTAGGCCTAG)
(A C G A G A C T G T C T T T A A G C A A G A A A C A T C C T C T A T G)
(A G T G G C T G G G C C C A T G G G C G G T G G G A G C A C A A C G T)
(A ATCTTTAAGTGCGAGTTATAATATCCGCCATTCT)
(C C C T A A TC G T G A T C A T T T T T G G G A GC G A C A A G C C G)
(GGCATTTACTCTACGACCCAATGTTGCGCTCGATG)
(C C G T C G C C C G T C C T A C C T A A A C A C A A G C G G A A T G A)
(C G C G A C C T G T C G A G T G G A G G T A C A T T G T A G T A G T C)
(ATAACATTTTCCACAACGTGACTTCCGCCGCGGAC)
( G G T T T A ACC GAC G GATGGGTGACTAGGATAGACAA)
(AGCGGGAGAGCCGCGATACACTTCAGGTCAGCCCG)
(C G T G A C T G T G TATGTGGTAGGAGCTCAAACTCGCC)
(TAGGAGCGGGACGTCCTGAGAGCTCTGAGTTGTGC)
(GCCCATGCAGTTGCTAAATGGTTGACCCCACCTGT)
(TCAATTAGATAGACACTGTTGGGGAGGAGTCCCCT)
(A ATTATGTGGAAGATCTGAAGGCGAGTGGACTGGA)
(TACAGTTACCCACAAGACTAGAAGCTGGATGTCAG)
(GTGAGCCCAGAA GAACGTCTTATAGTTCGTCTTGG)
( $T$ G GAGCAA GGCTTCGGCCCTGGCAAATTGCCGGGG)
(A T T T T C A C A T T A GC T G G GCT G A T T A T T T G A C T T G G)
(CAATACTCGGCACACCAAGGGGTGCATGATGAGCA)
(A A G GTA T GTCGAACCACTGCTGCAATCTCTAAGTA)
( $G A T T A A A A C A G A A T C A G T G G A G T C A G C G G A T G T T A)$
(GCTTCAGTTCGATATCGTGTCGCTCATCGAATATC)
(A A G A A TAGCTCATAGTCTCGTAACGACATGACATA)
( G G A ACATGTAGCTTTAACAAGCCTAGATTGACGGG)
( T T G T A GC G TAC GTTCAACTGGCATCACGGTGTCGA)
(GTATCCTCAACGCGTCCACGTCAACATATATAATG)
(CTAATACTCTATGTTGATACTGAGGACTAACACCC)
(CTGCGGACGAGGGGAGCTCTGGTACTACGAGCTTC)
(AGGTTCGAGGATCATACCATTAATCCGAGGTTGAA)
(GCTATCGGTAGAACTTAGAGGTACTGTCC GTCCTC)
(C G TCGGCCGGTCGCTTTATCCGAGGTGTGAGTAAT)
(CAGAACTCGACAGGCCGGATTCGCACTCTCGATTG)
( $\mathrm{T} A \mathrm{~A} T \mathrm{G} C \mathrm{G}$ G A C T G G A C T G A C C C T C C G G G A T C T A T T T)
(A GTTGCGGAGCCCATGCTTGTCTCCATTCAGACCT)
(T T T TAA G TCGATAGTTTCATATACGCCTCGAGCTA)
(GACTAGTGCTTCGTATGTCCCTAAGCATCAGTGGG)
(AGTTTATCCACGAAGTACGCCGAAGCTTACATTAT)
( T A G G T C C C A C G TCCCGTTC G GCAGC GTCCGAGCAC)
(A A A GTCACACTGACTCGAACATCCCACAGTCTTGG)
(CGGATCA GATCGAATGACTTTTTAAGTCGTAGACC)
(T TCCTCTGAGCACTGTACCTGGGAGGATACGTAGA)
(A ATCCATAACTGTTGTCGTTTCATGCCTATTCCTT)
( T T TCGGACGCGAATGCTTACAAGGGGAGCGTGCGT)
(CCCATTC GACAGGGAGAGTCCAATTTATAATCGTT)
(CTCGGCAACTAGCTACACGCAAGCACATAAGAACA)
(GCGAGAGCATCACCTCTCATGGGCTCACCGAACCC)
(ACCGGACAACTCCCCGACGGATAGTCTTTTATGCA)
(GCGTCACACCAAGTCATTCGCTAGAGTGATGTTGG)
(CTGAGCAAGGCACGTGTAGGCAGTGAGCGCTTTTT)
( $T$ TGAGTAAAGACGTAGAGCGCGACAGCCGGGGCTT)
(CTGCCACTGGCTCACCTGTACATCGGAGTCCTAGT)
(CAATGCCGATTGTTTGCAATTGGTAATTTCCGTGT)
( $\mathrm{T} \subset \mathrm{T} G \mathrm{G} C \mathrm{~T} G \mathrm{~T} T \mathrm{C} G \mathrm{~T} A \mathrm{G}$ TAGAGTACCCATAGCGCTCC)
(C T A T A C C T C T T T G T A C C A A A ACCA GATCTCCAGTC)
(C C G ATT GTGATTCGGGTAAGCCTATTGTGGGAGCT)
(AGCTATTCTTT TAC GAGACC GCCTCGCACGCCAAT)
(CGGCCTATTAAAAAGGGACCGAGTTAACTGACATC) 0
(CGCAATGTGTTTCCTGTGCTATACTTTTTAAAGTT) (GATGCCGAGGCACGCGTTGTGCGCCACAAATATAA) ( GAATCCATTGCCTGAATGGTAAAACGGCGGCACCG) ( G G TCGAAGAGTGGGCGTCGTCTCCCCTAGGATTGA)

(A TAGTGTTTGGTTAACGGATACGCGGTATTTAGAG)
( $T$ G TGC G T T G G GAA T T GCCA GACATTGTAAGCAGGA)
(TACACCTTTGAAGTGCGCAAAGCCGAATCTGCGAC)
(GTAGATGAACACTTTCGATGAAGACGTCAGCATTA)
( G GAAAAGAGAACCGCTCGAGATCCGGGGGAACAAA)
(TTCCCTGGACCATGCAAATTCAGGTGCAATACATA)
( T A T G A C GCCCGCA A A GTCCTTGCC GAACACACCTA)
(ATGGGATTCGGTGGATGCTCGTGTAGCTCAAGCGA)
(TCTCTGAGCTTGTTAGTGAGGTTTACGGCACAGCT)
(A A ATCTTAGAAGAATGGATCGCAGTGGTTTCACCA)
(A GTATATGGACACCCTTGGCAGCGGTTCACCCTCT)
(GCTTTGATCGAATGCGAAGTGCCCGTACGCGACAG)
( T TATGGCGATGAGGACCTGGTTACACACCCACCCC)
(T TC G TA GCCTCA GAGGCCAATTGTAC GAAGGCTTT)
( G G G TA G G TCCACGCCTAGTCGGTTGAAGCTGCCTT)
( $C$ CAACGCTACGATAGGGAAGGCCGCACGTTACGTA)
(AGACTACTCGTGATACATGAAATTCGCCGACGTTA)
( $T$ GTTTACGTACACACAAGGCGTCGTTGACGGACGC)
(CGCTCCCTCGAGAGATTCGGTTGCCTACACTAGTA)
(TAAACACA GT GTACATATCGTATACCTTA ACTTA)
(T GTCTTACAGTTCCGACTTGCCTTCTAGTCGTGGC)
(CAACGGACGGGGCAGGGTAATCGGGGGTGCGCATC)
(CCAAGGTTAGTCTAATCGCCCAACTGCTGCATGAC)
(CATAACAACGGACCTCCTAGGATCTCGAATACCTT)
(T T TA G T TACAACATCCGTTTATGGTTTCACATCAA)
(TCGACTCAGTATTGGGTGGCCATCCTTACGTATAA)
(CAATAGTAGAATAACGTTCTGAAAATCACGGGGAG)
(CAAGTTCGGTCAAGTTCGTTGGCTCTCAGCGCCAT)
(TGCGCAACATCTACAAAATACTACGGCTATGTACA)
(CAGAACA GAGTCGGGCCCTTTGGATCCTCCTCTAG)
( G G G G C G G T TC G T T A G GACC GA GACTGAC GCCTTC G)
( $\mathrm{C} T \mathrm{C}$ GTTTXAAAACTCGCGCGCTTTACTTTTGAGCAGT)
(GATTGGCAGAATAGCTACTAAAACGGCTCGAACTA)
( $G \subset T G A T A G T A G G G G A C G T T A T A T T C A G A G A T T G C C)$
(GGATTATTGTCAAGTAAGAAGCGTAGTTATGCACG)
(GCTTCCGCACCACAAGAGTTXATAATCACGATGTG)
(ATTGCGCTCTATCAAATATCGGAAGAGCTAGTAAC)
(TACGCAAACTAGAGGTGGCACCTCTCTAGTCACAT)
( C G G T G A A T A T T C G T C T C C C C A C C G C A A T G G T C C C C)
(CCAAAGCAGTAAATCACTTCTCGACGCAAATCCAG)
(TGTCCCTCTGACAACGGGGACGCTTAGGCCTTGCA)
( G GTCTT GTTTCCC GCTAAGTTCGCTTTTGTAATCTC)
(ACTAAATTGTAAGTCATGCTAGTAGGTTCGGATGC)
(A A GCCAGAGAAAAATTCAATATGCTAGCGCACTCG)
(TCCATACCTCGAATAGACTGCTTCGCAGTATACTA)
(C C A GTC A ACCATCTTXACGGC GATCCGT GCACCTCC)
(ACCTTAAGTTCAACAGTGGAAAACTAAAGTGCGCT)
(GCTTGGAGAGGGGGGTACAACAGACGTTACCGTTG)
(TCCTCAATCAGATGGCGGAACCCTAGGACTTACCT)
( G G G G GCGAGCAATCCCACTTGGATTCCGGTAGCCT) (TACCCCAAAGTGCGTCAATCACCAACGTTGAATAG) (GGTCCATATGGTGTACGTAAGGTTGCCAGGTGAAC) (TAACTAGAAATTTCTAATAAGGGGAAAATTCCGCA) (TATCGCCTAGGGTTCCCACTATCAGTAAAGGCTGT) ( GCTCCCTCGGTTTCTCGGTCCATGAAAGCTGTGCC) (CATCGGAAAGGGACGCGCAACGACAACGGGTCGAG) (ATTTCAGAGCACAATGGTTATGATACTACGAGAGA) (CCTGTTCAAGCGCGTATGCGAACGCCTATGACAAA)
(CAATAGATGGATTTACTTGAGTTATTAGATGTGCC) (TACAGATACTCTAGCGTTCCCAGTCCATAAAACAT) (GAAGGATGATGCAATGTAGTAATGAGGGCCGACTG)
( A TGGGTGAGAGCCACCCACTGCGGCGTGAGTAATT)
(A ATCATCGAGACGAGATGCTTCTGAAATAAATCAT)
(A A C A A A G CAAGATAACACCCCATCDTMGGGACGTAAATG)
(GGGTCCATTACAGTCCTGGTTCCAACATGAGGCCC)
(TCAGTGGCCCGTCTTCGTTCTCTCCCGTGCGGCTG)
(CCCATTTACCTGCTAAGCACGATGGTCGCGACGCT)


(AGTTTGGCCACCGAGCACCAGTTCATGTACCGGGC)
$\left.\begin{array}{lllllllllllllllllllllllllllll}(G A & C & C & T & G & C & A & G & G & G & A & C & T & A & G & C & A & A & C & A & T & G & A & C & C & G & C & C & G \\ (G) & C\end{array}\right)$

(C GTTAA GATTTGCTCTCCGACAAGGAGTGCTAACA)
(A GAGATTATGCCTACAAAGACCTCTCCTATTCTTA)
( $T$ GGATT GTATCGCACCCTTAACAGGGTCACTTTCG)
(AGTGTCATGTGTCGCGGTACAAAGCGTGCGAACTC)
(CGTCAAAAGCACCCTGGTACGGCTGTACTACTGGG)
(GACAGTAGGGGAACCCCACCTGCGCACAGTGCGAT)
( $C A G G G G T A A A C A C A G G C C T C C T G C A G C G T A G T A T T)$

( $G A T C G C C G G G T T G T G T G G G G T G A T G T C C C T A A A T G)$
(AGGTGTGTGAACCTAAACGCCTTAAAGCAAGAACG)
$\left.\begin{array}{llllllllllllllllllllllllllllll}(A & A & G & T & G & C & G & G & T & G & T & C & G & C & G & T & A & A & T & T & G & C & G & T & C & C & A & G & G & G \\ \hline\end{array}\right]$ )

( $T$ T GTTTGACACAATTGCAGGTGGAGGTACGTCGAG)
( $G$ GCCTTGCACTTGC GTGAGATAGGTTGGTATATGG)
( $T$ TGCGTCGGCTGTGGCTGTCCAACAAGACGCATCA)
(A ATAATCATACGCGGCCACCGGTCTGACTTACGAA)
( G TCCGCTGCGTTCTTCAGCTGGCTTCTGTGAAGAT)
(GGCC GCATATATTAGCTGAATAACCTTGTGGCCGAC)
(GCGAACATTATGATGGCTTTGCGGCCGACCGTACT)

( $G A G G A G G C A A A T A A C A C G C C A C G G C T A A A T T G T G C)$
( G GCGTAACACACACACTTCGATTCCTGTAAACTGC)
(CGAACCCGGGCCTAAACGGCGACCGTGACTGAATA)
(T GTC T G G A A GCTCCCACAATCAGTAGTTACCGCCAA)
(GACATGCTTCTCACCCAGCTCCAATAGGCAAACAT)
(TGTGACACCATTCATGGCGAGTGAATCCGTATACC)
( T G T G C T C T T T T T T T A G C A T A A T A A C T A G A A C A C T A)
(ACGACTTTCAGGGATTGCTGTTCTGCTCTGGGATT)
(TTAACCTTAACAACGTTCGTGGGCTTTCGGTTAAA)
(CAGAGCCTTTCTACCGTCATATAGCTAGAACGCGT)
(TAGC GTCCAACTGGCTTTTTAAGCTATCCGAATGC)
(CCGACGGTAGCAGGCATTCCACCTTACGTCGCCGT)
(ACCGGCTTCTCACCGCCAAGCACTTGACTCTCTAT)
$\left.\begin{array}{llllllllllllllllllllllllllll}(A & A & G & T & G & T & G & C & A & G & T & A & A & G & A & A & C & G & C & G & G & T & C & A & T & C & A & G \\ C & A\end{array}\right)$

(C C T T G A TCCATGCGCGCCGAGTGACACTGAGGGAA)
(ACACACCACTCGTCACGGGAAAACGGCACCATTAC)
(CCCTGTTGGACCGTATTAGGCTCCTCCCAGCACACG)
(ATATCCCGATTCGATCCAAACTAGAACAAACAGCAC)
(TA G T C T TAACGAGGACCAAAAGCCTGAATCCAAGGT)
( $\mathrm{C} A \mathrm{~A} G \mathrm{~T} C A T \mathrm{~T}$ TAACTAGAGCATGCGCCTTGATCGGC)
(A ACTCACACGAACACGGGGGATTACGACGGTACGA)
(GGACATCAGCTGAATACTGTCGATCGGCGTAAACT)
(CAC C T GCCGTTGTGCAAATGGACAGTTAGTAGTGAG)
(CGGCCTGGGCACACTATCCCACGAGAGGAGCAGTG)
(A ATGGTGGCGGGGAGTGAGGTAACCGCTMTCCCGGA)
( $G \subset C C G C G G G A G G C G T T G T T A C C G A A G C A G G C C G C C)$
$\left.\begin{array}{llllllllllllllllllllllllllll}(T & T & G & C & G & A & A & C & A & C & G & C & T & C & G & A & G & A & A & A & C & G & T & T & G & C & T & T \\ (G X & A & A\end{array}\right)$

(CACGGACCGAAAGCCAGAACACATGAACATGCATA) 0
(GAAGGATGATGCAATGTAGTAATGAGGGCCGACTG)

|  | (TAA |
| :---: | :---: |
| 444 | (TGCAGTTCCACTACCCTAATTATTACCTACCTCGCT) |
| 445 | (GCATC T T G TCCAT GTTATCAAGTCTCCGGGGGATGT) |
| 6 | (TCGGCATA A T A A A A T A C A T T A C C C T A A T GCCCCTT) |
| 447 |  |
| 448 | (TGGTCGC G C A A C G T T T T T T A T T G G C A T T A A T T A A A) |
| 449 | ( A A C C T G T G T A A C TCGCGCCA A T G A G A G A T G A A G C A) |
| 450 |  |
| 51 | ( $C$ G T A A A A C TA C C T T T T C TCACA A G C T C G A A T A C G G) |
| 52 |  |
| 453 | (AGAGTTTCACAGGGAACAATATGGGTGCGGCAAAA) |
| 454 | (CTGAAGGAGTACAAGCAGCCGTCAGCATGCAGAAG) |
| 455 | ( $A$ G A TA G C T A G C T A A C G G A A C T A T A T A C T A A C T G G C) |
| 456 | (T T T G G A A C T G G T A G A C A C G T C T T C GCC A G A A A C C T) |
| 457 | ( $C$ A A A C T A G A G G C T A C C A C T A G T T T T T C G A C C A G G) |
| 458 | ( C C A A T T A C G TCTTTGTTACTATTTCAATA GCACCGGGG) |
| 459 | (T T A G A T A G A A T T T T T G C T C A C A T G G A A C G T A G T A A) |
| 460 | ( G G A G A G A T A G TCCGAGATTGTCTCATTGGCTCCAT) |
| 61 | (GATCAGTGCCAGTTCAGAGAGAGCTGATGA G G G G A G) |
| 62 |  |
| 463 | (GACTTGGCTTGTAACAGAATACACTCGTGCCAATA) |
| 464 | ( C G T A A A G G C G T A C T C T C A A G T C G T GTA C T T C G C T A) |
| 65 | ( C G A C GCAT ACATTAT GTTCATTCCAGTTAACCACTC) |
| 466 | ( С CA A GA CACCGTAC G A T TAA T GTGGGCAGCCCTA) |
| 467 |  |
| 68 | ( $A$ TCGATTTACTTTTCAGTCATCCTAGTGATACGCT) |
| 469 | ( $A$ TGCAAATCGCCAGCTAGGGAAAGAATACCGTTAG) |
| 470 | (ATCTCCT T G A G C G G C C T C T GA A G T G G C A G A C A T T G) |
| 471 | (CCTATCCTATT G G T T GCCCTACATTACCACGCC |
| 472 | (TCACCGAGCTATTA G T A C G A G T T T A G A A C T C T G T G) |
| 473 |  |
| 474 | ( A C A A C C C A A A G A G A T G A C A T C A T T G A A A G G G G G C A) |
| 475 | (A A TCATCTTCTA A A G C G A C T G C A T C C G C C G G C A G G) |
| 476 | ( $\mathrm{A} C \mathrm{~T}$ GCGATGGTGCTACGACAGAGCTCAGTGCCGTT) |
| 77 | ( A A A C T TA A G G A T G T A A G T GCTC A G T T A T C A C G C C C) |
| 478 | ( $C$ T A A T $T$ A G G T GCGGACGACAC G C G G G A T T T C C T A G) |
| 479 | (ACATT TA A T G A T A G A G A A G T C T A T T G T T T C G T T A A) |
| 480 |  |
| 481 | ( G G C G C C T T C A T T G A T G G G C T G G GCC G G A T A C C T G A) |
| 482 | ( C T G G G A A T A T G A T T C T T T A A T A T C A A A G T T T A T T) |
| 483 | (GCCACCGTCTATTCGCGTTGAGATGGCTAGAAGGA) |
| 484 | ( C T A T T C G T G T GAGGCTATATCCTCCGGACTCGGGC) |
| 85 | (A A T A T G G T TCGTCCTCAGAGCGTGCACTACGGGGT) |
| 486 | (TCCAGACTGGCGGGGTCTTACCGCCACAATTTTTA) |
| 487 |  |
| 488 | ( $C$ TTGGCATAACGA ATACGCTGTAAGTACACACTCG) |
| 489 | ( C A G G C A T C T C C A A G C A G A T T C A T A T C A T C T A C G T T) |
| 490 | (A A A G G G T G A T C G TCTCTATC G A T G A T C G TCGTC TA) |
| 491 |  |
| 492 | (GATGAGCGAGATA A T G T GCCCACTTC G G C T T A G TA) |
| 493 | ( $C$ TCAT GATCCGCTCCAAGAGCGCTGC G A T A C A C C A) |
| 494 | ( $T$ TGTA GTCCTAGGCACACTACACGTTTACAACCAG) |
| 495 | (GCTATGCAGATTA G T T G G T G A G C C G C G A G C T A A T C) |
| 496 | (TCTATGAAAGACGGTCGTGGGGGTCGCACTAGGAC) |
| 497 | ( $C$ T TAGAAGGTTCCCGCGCCGCCCGAATTCGAACAG) |
| 498 | ( G T T T G T A C A G G C G T A G A G G G G C T G C G T A T A C T T G C) |
| 499 | (TACCTAGCTTACTGACA A A G C A T C A G T G G G C G T C C) |
| 500 | (TGCAGACATGTGCTGTTTTTAGCACCTTCGACTAC) |

average fitness of population $0=0.0$
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average fitness of population $96=0.0$
average fitness of population $97=0.0$
average fitness of population $98=0.0$
average fitness of population $99=0.002$
average fitness of population $100=0.028$

Generation 100 population ...

 (A G G A T C C G A A C C C T T A C A T A A T T C G C A T G A T G G C C) ( $G$ G G G C T T A C T C T A A A T C G G T G A T A A C T A A T T C C G C) (GGGACATCGTCACGTGAAATTCATTGACGCAAAGC) (A TAGTTGTTTACCAAGGGAAGTTGGATGCCTCTGA) ( T A T G T A C A TCGTCTTACAGTTCAGACAAATTAGGC) (A GCGC G G A T A G A T T A T T T G G T T C A G C C T C G G G C C C) ( C A T A A C T G T A C T A A T T T A G G A G A C C C C A T T A C A G G) (AGGATATAAACGAATTTAGGAGATACACAAGGTGC) (A G G A C C GC G G A T C A G A T A A G T GAGTACCCACCGAG) (GAAACCGCGAGATGATTCTGTTTTAGCACTACCAC) (C A A A T A T A TCACATCATCAATAACTGACTAACCAC)
(A G G A C C G C G G A T C A G A T A A G T G A G T A C C C A C C G A G)
(A ATAACTGTACTAGCTCTGAACAGCTTAAGACAAG)
(A TAATGGCTACTATAATTTAACATTGTGAGTGCGA)
(TATACTGAAAGGAAAGGTGATTGAACCCCCTACGC)
(TATTACTGAAAGGAAAGTTGATTGAACCCCCTCGC)
(CACACCCGAACGTAACTTGGGTAACTTAATGGAGT)
(C G G G T A T T G G G T G C T GAC G T G T T T T A A A GAC G G A C)
( C G C A C G A T A C G T A T A G T GA G T A T G T G A T A T G TC G A)
(A A ATGACCCACGGTTAGGGAAATAATCACCTCATG)
(A A T A A C T G TAGGCTTTAGGGTTGGCCATAGCGGTG)
( T A T G A C C C A T G G G T C T T G G C A A T A A T C A C C T C A A A)
(TACGTACATCGTCCTATGGGGCACCACTACCTCAT)
(GACACTTACACGGTCTTTTTCAGCTCTGCCTTCTG)
(ACGGCATACACGGTTAGATTTATAAGTAATAGGCA)
( T A T G T A C A TCGTCTTACAGTTCAGACAAATAGGCA)
(ACGTTCCGATCTTTCCACAATAACACC GAACTGTG)
(AGAGTGGCAACAGAATACGTGTTTTAAACCTACCT)
( $\mathrm{C} A \mathrm{~A} G \mathrm{~T}$ G G T C A TC GTTTCATGATGCATCGGAAAACA)
(A A T A A C T G TACTAGCATCTGAACAGCTTAAGACAA)
(A G GACC GC GATAC GTTAGCCCTAGAATCGGATACA)
(A G T A A C G T T T T G T T A A T T A A G C A A T T T C T T T T T C C)
(A ATAAGTAATAGCGAGTAGGAGACGGCTGGCACGC)
(AGGACCGCGGATCAGATAAGTGAGTACCCACCGAG)
(TACGTACATCGTCCTACGGGCATACCACGACGGAC)
(A ATAACTGTACTAACTCTGAACATTCCCCACAAGT)
(A GAGCAGAAACTAACTTGGGAGAAGTCTGCGATGT)
(CAAATATATCACATCATCAATAACTGACTAACCAC)
(ACGTCTGTAACTACTTGGGCGTTTGCAGAACTGCA)
(ATGAACGTTTACTACACAAGTTGCAATAGTGCGCT)
(ATAATGGCTTATCATTACAATACACACTCATTGTT)
( C G G G T A A T T T T C A G A A T C C C A A T A A G T C A A G A C T C)
(AGGATGCCATGTATCTTGGGTTAGGTGAGACTCCG)
(ACGACAGGATGCAGATTAGAGTTCAGTCATTGCGA)
( G ACACTTACACGGTCTTTTTCAGCTCTCCCTAAAT)
(A A ATGAGCGTAACATGACACTCGATCACTCGTCAA)
(C GCAC G A TACATAAATACGGAAATAACAATAAAGT)
(A GATATCCTATATTATAGTTTGTCACCTAAGGCTG)
(A A C A C G G A T A G A T T A T T A T T T G T A A C C A A T G T G C T)
(CAGTCTGAAAGGAGGAATCGATTCGCCCAGCGGCG)
(CAGGTGGTCATCGTTTCATGATTAGGTTATAATCG)
(ATGAATGCTACTATAATTTAACGATTGTGCTATAA)
( $\mathrm{C} A \mathrm{~A} A \mathrm{~T} A \mathrm{~T} A \mathrm{~A} A C G G A T A G A T T G T T T A G T C A T A C G G A)$
(AGGACCGCGGATCAGATAAGTGAGTACCCACCGAG)
(AGGATGCCATGGGCAGTCAAAGCATAAGCACATAT)
(AGCAGCCGAACCCTTCAGACCTAGCTGAACTCCGA)
(AGCGTACTTATAGATACAAATAAAGAAATCCGGCA)
(A ACACGGATAGATTATTATTTGTAACCAATGTGCT)
( T A C A T C T G A T A T C T C C A C A A T A A G G C C A A T A TC G G)
(A T A T T A T T A A C T C T T A T T G A GC T T G A G T T A T T C G A)
(A G T A T C A G T G T G G T A T T C T G T T T T A G C A C T A C C A C)
(A ATAATCCTAGATTATTTTTCCGCTCTGCCTCTGA)
( $G C G T A C G T A A C G A T C T T T T T G A T G C A C A G T G T C G A)$
(ATACTGCCATTACGTTAGCCATTATTCCCATAAAT) (A G T G C T G A A A T G A G G A G T A G G A G A C C T T A A A C C A C) (C G C A A C G T T T A C A T A A T A C T C G A T C A C T C GTTGCT) (A T C A T C C T T T T G C T A T A C T A A A C T A A G T G A T T G C G) (TAAATACGTTTTCATTACATGGTTCTAGCACACAG) (C C T A C C A G A T A T C T T T C A A GAGGAGGCATTCCCGC) (C C G A C A TCGC G A ACCCAATTTGACACCGAGTAGAT)
(ACGGTATTGTGCATAACTAGTTGAGCCAGACTATG)
(CTGGTAACGACGAAGTTAGGTTGGCCATAGCGGGC)
(ATGACGTGTCGTCTAGAGAAATAACCTGCTATAAT)
( $G G G A C A T C G T C A C G T G A A A T G G G C A T C C A T T A T T G)$
(A A G T T C A G A A A T G G G A G G A T G A T A A C TAATTAGTG)
( $C$ G G G T A T T G T C G G A T A T A G T A A T C A A A A TC G A G T G)
(TAGAAGCCCCATAAATACGGAAATAACAATAAAGT)
(AGGACC GCCGATCAGATAAGTGAGTACCCACCGAG)
(AGTACGTTAACAGAGGGCAATAAAGTAATGGAGTA)
(CCGACATCTAACATTAGGGTTGGCAGTCACGATTG)
(CAAATATAAACTACTTGGGATCCTAACCC GTATTG)
(A ATAACTGTAGGCTTTAGGGTTGGCCATAGCGGGC)
(C C GACATCCTTACCTAAGCAATGAACCCCCTCGCA)
(A GTACGTTAACGCCAATTXAACAAAGTGAGAGCAG)
( C G G G T A A T T T T C A G A A TCCCAATAAGTCAAGACTC)
(ATCATCCTTTTGCTATACTAAGTGTAATAACGCGC)
(AGGACCGCGGATCAGATAAGTGAGTACCCACCGAG)
(ATGAAC GTTTACTACACAAGTTGCAATATGTGCGC)
(ATAATGGCTATCATTACAATACACACTCATTGTAT)
(A A A TGAGGTAACATGATAATTCTAACTCTCCAACA)
(AGGATCCGACACATTATGATCGTACCACGACGGAC)
(ATACCGGATAGATTATTCTGGTTGGCCTCCTATCA)
(ACGACAGGATGCAGATTAGAGTTCAGTCATTGCGA)
(A G GACGGATAGATTATTTTTCCGCTCTCCCTCTGT)
(TATACTGAAAGGAAAGTTGATTGAACCCCCTCGCA)
( G G A C T A T C C T A T A T T A T T C T G TCCTGCACAGCACA)
(A A GTTCAGAAATGGGAGGATGATAACTAATTAGTG)
(A A TAACTGTAGGCTTCAGACCTAGGTTTCTACCAC)
( $C A G G T A T T A A T C A G T A T T C C A T T A T T C G A A C T G T G)$
(CGGGTAATTTTCAGAATCCCAATAAGTCAAGACTC)
(CAGGCAGTTTTACGTATGAGCGAAGTCGTAGCCTA)
( $G A C G T A T A T A T C T A A G G G A A G T T C A G T C A T T G C G A)$
(ATAGTATAAAGTGAAATTCTGGATTGCCAGCATCT)

(CAGTTATTGTCACGTTGTGGGTTCGCACAGATCTA)
( $\mathrm{C} A \mathrm{G} A C \mathrm{~T} G \mathrm{G}$ TCATAACACGGAAGTCACCTCAGCCCC)
(AGCGCGGATAGATGATTCTGTTTTAGCACTACCAC)
( $\mathrm{C} A \mathrm{~A} A \mathrm{~T} A \mathrm{~T} A \mathrm{~A} A C \mathrm{G} G \mathrm{~A} T \mathrm{~A} G A T \mathrm{~T} G \mathrm{~T} T \mathrm{~T} A \mathrm{G}$ TCATACGGA)
( A A CACT TATAGCCTTCATTGAGTCCGATAGTGCGC)
(AGGAACGTATGTATCTTAGTGAGTCCATCTGCAGC)
(CCTACCAGATATCTTTCAAGAGGAGGCATTCCCGC)
(AGGATATAAACGAATTTAGGAGATACACAAGGTGC)
(CCGACATCCTTACCTAAGCAATGAACCCCCTCGCA)
( $G$ G G GCT TA C TCTAAATCGGTGATAACTAATTCCGC)
(C G T TCAGTAATCAGTAATTTACTATTGACCTCAAA)
(TAAAACGTTTTATTATTCTGTATCAGTTATATTGG)
(ATAGTTGTTTACCCGGATTGCCTATTGAGGCTACG)
(ATCATCCTAATGTCCTCGACGACAACATATATATC)
( C C GACATCGCGGAACCCAATTTGACACCGAGTAGA)
( $\mathrm{A} T \mathrm{~T} T \mathrm{~T} T \mathrm{~T} G \mathrm{C} T \mathrm{C}$ TATCTTGGGTACAAAGACCACGGT)
(C G G GC T G A A A G GA G G A A TC G A T TCCGC C C A GC G G C G)
(ACGACAGGATGCAGATTAGAGTTCAGTCATTGCGA)
(AGAGACGTTTACTTTAGGTCATCCTCAGGAGATAT)
(AGATTAGCCACCCTTAGGTCGACAACAAATTGTAT)
(AGGACATACACGAAATCGGAAACAAGCACTACCAC)
(A ACATCCTAATGGCGCCGCACATGTGATGCGATAT)
(AGTATATCAACGAAACGTTAGTTAATGACCACGGA)
(AGGACCGCGGATCAGATAAGTGAGTACCCACCGAG) (A G G G C A C T T A C G C C T T T G A C G A T C A G T C A T T GC G A) (A G T G C T G A A A T G A G G A G TA G GA GACCTTAAACCAC) ( C GCAC G A T ACATAA A T ATTTCCGCTCTCATTGCGA)
(A TAATGGCTACTATAATTTAACATTGTGAGTGCGA)
(ATAATGGCTACTATAATTTAACATTGTGAGTGCGA)
(A GAGCACT TACGCCTTTGACGATCGGCTGGCACGC)
(A G T A A C T G TACTA A TACAA GTCATTGTGCTATAAT)
(A G G A A A A C TATGCATAATTTATGGTCACCGCTGAA)
(A G G A T A TAAAC GAATTTAGGACAGCTACAATCATG)
(AGAGAACCGTCACGTTGTGGATAAGGGCCATGCCC)
(A TAGTATAAAGGAAATTCTGGATTGCCAGCATCTT)
( $\mathrm{C} A \mathrm{G}$ G T A G T T T T A C G T A T G A G C C T G T T T A T A C T G T G)
(A GCGCGGATAGATTATTTTTCCGCTCTGCCTCTGA)
(C G G G C T G A A A G G A A A T T C T A T T TT TAGCACCTCATG)
(TACATCTGATACCTCCACAATAACACTGCTATAAT)
(TATACTGAAAGGAAAGTTGATTGAACCCCCTCGCA)
(CAGTTATTGTCACGTTGTGGGTTCGCACAGACTAT)
(A A GCAACCTATCAC GTTGTGGGCTTGAGTTATTCG)

(A TAATGGCTATCATTACAATACACACTCATTGTAT)
(A A T A A T C C TAGAT T A T T T T T C C G C T C T GC C T C T G A)
( $C$ G TAC G T T T A C A G A T A T T G A GCATAGCACTAGGCA)
(AGGATCC GACACATTTTGGGTACAACATATCCGAC)
(A GCGC G G A TAGATGATTCTGTTTTAGCACTACCAC)
(AGAGACGTTTACATATACTAAGTGTCAATATGCTA)
(AGGACC GCGGATCAGATAAGTGAGTACCCACCGAG)
(A GAACATACACGATTTCTATGGGCACTCTATAAAT)
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(AGGATGCCATGGATTTTCAAGGTAGGTATTCCGAC)
(A A ATGAGGTAACATGATACTCGATCACTCGTTGCT)
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(GGACTATCCTATATTATTCTGTCCTGCACAGCACA)
(AGGGACCGCGGATCAGATAAGTGAGTACCCACCGA) (CAGGTGGTCATAGATACAAATAAAGTAATGGATAA)
(C A T A A C T GTATCAA G GTAGTTCCAGCGTACGCCTAA)
( $T$ ATACTGAAAGGAAAGTTGATTGAACCCCCTCGCA)
(GCTACCAGATATCTTACGGGCCGCTCTCCCTCGCT)
(A GAGTACTTATAGATACAAATATAATCACCTCAAA)
(CGTTCAGCAAACGTCTTTTTCAGCTCTGCCTTCTG)
( $C$ C G A C A TCT TAACATTAGGGTTGGCCATAGCCGGCA)
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(A G G A T GCCCAC GAACCC A ATT T GTCACCTAAGAC GA)
(ATTATCGCCTCTAAGAGCCCCGGAAGTAGTGCTTG)
(A GCGC G G A T A G A T T A T T C T G T A T C A G T T A T A T T G G)
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(ACGATGCAATGGAAAGTTGATTGAACCCCCCTCGCA)
(AGTGC G G A TAGATGATTATTCATGTCTTCTACCAC)
(GCTACGTCCAACAAAACAAGTCATTGTGCTATAAT)
(TAAAACGTAAATGGAGAACCATTTGGCCAATATCG)
(A ATAACTGTACGAGGAGTAGGAGACCTTAAACCAC)
( $C$ G G G G TA $A$ TAAACGGATGGGCCAGACAGATAGGGC)
(CAGT T T T C A A C G GCC TTTTCCAATCCTCAGCGATAT)
(A ACAGTTACCACAGATTAGAGTTAGAGCCTCACCA)
(AGGAT GTCAGCCATAATTTATGTACCTCTGCGGAC)
(C G G G T A ATTTTCAGAATCCCAATAAGTCACACGGT)
(ATCACGTCCAACAAAGGTTGGTTCCTCAGCGATAT)
(TATACTGAAAGTCCTAGGGGCACCACTTCTACCAC)
(ATAATGGCTATCATTACAATACACACTCTTCAACA) 0
(GGGTTTTGTACTAGTTAGTAGGATCTCAGCGATAT) (A G G A T C G C G G A T C A G A TAA GTGAGTACCCACCGAG) ( G C TA T G GCTACTATAATTTACACATTACAGCACAA) (A G G A T G T C A GCCATA ATTTATGTAACTCTCCAACA) (CATTCAGCAAAAGGATATTGAGTCCGATAGTGCGC) (ATGATGGCTATCACCCTGTGGTTCCTCAGCGATAT) (A ATACTTATAGCCTGATACTC GATCACTCGTGTAT) (ACGACAGGATGCAGAGTTGGCACCACTTCTACCAC) (CAGATCCTAATGTCCTCGACGACAACATATATATC)
(A TGAATGTCTACATATACTCGATTCGGTTATTCTA)
(AGGAACTGTACGATTTCTATGGGCATCCATTGTAT)
( C G CAC GATATACATATACACGATTGGCTGGCACGC)
(GGAATATAAATCAGTAATTGTAACAAAGACCACGG)
(AACACGGATAGGACCCAAGTTTTTTATCAAGAATC)
(A G T A T A T T G T T GCTATACTAAACTAAGTGATTGCG)
(ATCGCAGGATGCAGATTAGAGTTAGAGCCTCACCA)
(AGGACCGCGGATCAGATGCCCTAGAATCGGATACA)
(A GAGACTAAACGAATTTAGGAGAGCACCTGCGATG)
(A TAGTGGCTACTAC GGATTGGGAAGTCGTTCCGAC)
(A T G G T A AC GAC G A A GTTA GTTTAACTGAACTCCGA)
(TACGTACATCGATTGGCGCTTAATAGCGCACATGG)
(A G G ACC GCGGATCAGATA AGTGAGTACCCATGCGC)
$\left.\begin{array}{llllllllllllllllllllllllllllllll}(A & A & T & A & G & A & G & C & G & T & A & A & C & A & T & G & A & C & A & C & T & C & G & A & T & C & A & C & T & C & G & T \\ C & A & A\end{array}\right)$
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(AGGATATCCTGTATCAGAACCCTTCATCTCAAGCC)
(A G A T C A C A A A C G G A T A GATTGTTTAGTCATACGGA)
( C A T A A C T G TACTA T T A C A A G T C A T T G T G C T A T A A T)
(GCTCCCGTCTATCGTATGAGCCTGTTTATACTGCC)
( $\mathrm{T} C \mathrm{G} G \mathrm{~T} A \mathrm{~T}$ TAATCAAGTTGGGCTGCAACAGCGATTG)
(TACGTACATCGTCCTAGTTTTGCCGTGACCTCAAG)
(ACGACATCTTAAATCTTTTTCTAGCTACAATCATG)
( $\mathrm{C} A \mathrm{G} G \mathrm{C}$ G T T A A C A GCTATATACCAGACCAA TAGGC)
(CGGGTATTGTCACTATACTAAGTGCCCGGAAAACA)
(A ACACTTACCACGTTAGGTCGACAACAAACAGCGC)
(CAAATGTCCAACAAAGGTAGTTAAGACCGATGGGT)
(A ATAACTGTAGGCTTCAGACCTAGGTTCATTGCGA)
(C GTCTA GCTGCGAACCCAATTTGTCACCTATTAAG)
(ATATTATTAACTCTTACTGCATTGACAATACTGTG)
(C C G A C A TC GTCA GTTTCATGAGAGAACACCTCATG)
(ACGGTATTGTGCATAACTAGGGATCTCAGCGATAT)
(ACTCA GCTGCGGACCCAAGTTATGTGATATGTCGA)
(GCTATGGCTACTATAATTGATTGAACCCCCTCGCA)
(A A C A C A T ACACTAACTTATTTGTAACCAATGTGCT)
(CAGGTGGTCATCGTTTCATGATTAGGTTXTTGCGA)
(CGCACGATACATAAATATTTCCGCTGACC GCTCTG)
(AGAGTGCCAACGAAAGTGTATCAGCATTGCACCCA)
(ATAGTGCCAATGACTCACGGGCACCACTTCTACCA)
( $C$ G G GCTGTGTCACGTTGTGGATAAGGTAGTGCGCT)
(ATGAATGAAACTAACTTGGGAGAAGTCTGCGATCT)
(A TAGTGGTGTCACGTTGTGGATAAGAGTTCAGCGC)
(A ATAACTGTAGGCTTCAGACTTTAGGACTATGCAC)
(CAGAC GTTAACGCCTATAGTGATTAGGTTATAATC)
(GGGATGCCATCTAACACAAGTCATTGTGCTACTAT)
(A ATAACTGTAGAATCTTTTTCTAAAGCACACCTTT)
(CGGGCTGTGTCACGTTGTGGATGTCACCTAAGAAC)
(ACGGTATTAATCAGTAATTGGTAACTTAATGGAGT)
(ATGAATGGTCATAACACGGAAGTACCACGACGGAC)
(CGGACATCGTCACGTGAAATTCATTGACGCAAAGC)
(A T T A T A T T GTCAC GTTGCTGAGCGAGTCAAGACTC)
( C G TACATCCTGTATCA GAACCCT TCATCCTACCGC)
(A G TGCTGAAATGAGGAGTAGGAGACCTTAAACAAA)
$\left.\begin{array}{llllllllllllllllllllllllllllllllll}(C & G & C & A & C & G & A & T & A & T & G & C & A & T & A & A & C & T & T & A & A & C & A & G & C & T & C & A & C & C & T & C & A & A\end{array}\right)$ )
(AACACGGTTTACATATATTGAGTACGCACCAGCCG) ( C GTACACTATGTCTCCACAATAACACCGATTGTAT) (A G G A TCCGAACCCTTTTGAATAAAACGAGCACAGG) ( C G C A T C T G TACTAGT TAGTAGGATGGCTGGCACGC) (ACGACAGGATGCAGAGTTAGAGTTAGAGCTCAACA) (CGCAC GATACGTATAGGGAGTATATTGACCTCAAA) (CGTCACGCGATCCCTGTGTGCGATCACTCGTTGTG)
(C G T C A C GC G A TCCCTGTGTATCTAACAAGCACAAG)
(CAACGGTGTTCTCTATCCTAATTAGGGTTATGGCA)
(A G A T T A GCCACCCTTAGGTC GACACATAGCCGC GC)
(ATAGTGCCAATGAAGAGTTTTGCCGCTGCCTTCTG)
(TACTTGTAGAGGGATAGATTCGATCACTCGTTGCA)

(CAGGTAGTTTTACGTATGAGCCTGTTTATACTGTG)
(A A C A C T T A TAGCCTTCATTGAGTCCGATAGTGCGC)
(AAATGAGGTAAGCTTAGATTCGATCACTCGTTGCT)
(A G G A T T GTTTACCC G G ATTGCCTATTGAGGCTAC G)
( C G G G T A T T GTC G G A T A T A G T A A TCAAAATCTCAAA)
(AGCACGATACATAAAGGGAAAGACCCCATTACAGA)
(A G A T A T C C TATATTATAGTTGTGATGAACCTGGGT)
( $C$ G G GCT G A A A G GAAATTCTATTTTAGCATACGCAC)
(A A ACGGTGTTCTCTATCCTCATTAGGGTCGTAGGA)
(AGGACC GCGATAC GTTAGCATAACTGACTATGCAC)
(AGCGTACTTATA GATACAAATTTTTAGTCATTGCG)
(AGAGACGTACACATTAGCCCCGGAGAAATGGCTCC)
(AGAGAACCGTCACGATTAGAGTTAGCCAATATCCT)
( $\mathrm{C} A \mathrm{~T} A \mathrm{ACTGTACTAACACAAGTCATTGTGCTATAAT)}$
(ACGGTATTATGCATTTCAAGAGGAGGCATTTGCGA)
(CAGGTAGTTTTACGTATGAGCCTGTTTATGTTGTG)
( $G$ TAGTATTATGCTAAGGGAAGTTCAGTCATTGCGA)
(AGGATCCGAACCCTTCATTGAGTCCGTGCTAGCTA)
(A ACACATACACGAAATCGGAAACAAGCACTAAAAG)
(C G T T C A T GCCTGGACTCGACGACAACAAGCACAAG)
(TACGTCCATCGTCCTAGGGGCACCAACACCTCATG)
(CAGACTGGAAACGGATCGATTGGCTGACGACGGAC)
(A ATAACTGTACGTTAATTGAAATAATGTAGTGCGC)
(A G G A T A T T GTCTTATTTAGGAGACCCCATTACAGG)
(TAC GC GCC TTTTCATTACATGGTTCCTCAGC GATAT)
(CCGATATTGTCACGTTGTAGTTGAGCCAGACTATG)
(C G T C T A T T G T GCATAACTAGTTGAGCCAGACTATG)
(C G G G TA T T G G GTGCTGACGTGTTTTAAAGACGGCC)
( C A A A T A T A A ACGAA TCGGAACACAAGCACTAGCC)
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(A A A G C A T GTTATCTTACAAATAAAAGTAAGGGATA)
(ATAGTGCCAATGTCGGTAGGTTCAGCCTCGGGCCC)
(TAAACATGCCTGATTAGCCCCGGAGAAATGGCTCC)
(GACACTTACAC G GTATTTTTCCGCTCTCCCTCTGT)
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( GCGACATCGTCAGTTTATCGATTCGCCCAGCGGCG)
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(A ATAATCCTAGATCCTCGACGACAACATATATATC)
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(CGTACACTATGTCTCCACTGGTTCCTCAGCGATAT)
(A ACACATACACGAAATAGAAATAACTGTCTTATAT)
( $\mathrm{CA} A \mathrm{GACTGGTCAACGTATGAGCCTGTTTATACTGTG)}$
(A A ATGAGCGTAACATGACACTCGATCACTCGTCAA)
(T TAATGGCAACGAATTTAGGAGAGCACCTGCGATG)
(TATACTTAAAGGAAGTTGGGGGGAAGTAGTGCCGC)
(CATAGAGGTAAGCTTGATACAATTTAAGCATAAAT)
(A GAGACGTTTACTTTAGGTCATCCTCTGCCTTCTG)

(AGGAAATTGTGTCTTAGATTGTTTAGTCATACGGA) (A ATATGCCATGTATCTTGGGTACAAAGACCACGGT) (A A C T T G T A G A G G G A T A G A T T GTTATGAACCTCATG) (A GAGTGCCAAACGGATCGATTGATACTTAAGACTG) (CAAATATGTTATCTTGATTTCAGCTCTCCCTCGCT) (A GTGTGCAATGGAAAGTTGATTGAACCCCCTCGCA) (C C G A C A T C C T T A C C T A A C C C C G G A G A A A T G G C T C C) (TAGTTTTCTAATGCTTGGGTGTTTAGTCATACGGA) (TATACTGAAAGGATATACTAAAGTGTCAATATGCT) (C G G G T A ATTTTCAATTACAATACACACTCATTTGT) ( G G G G TATAAAGGAAATTCTGGATTGCCAGCATCTT) (A T G A C G T G TC G TC T A G G G A A GTTCAGTCATTGCGA)
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(A G G A TATAAACGGTCTTGGCAATAAGTCATTGCGG)
(TAAAACGTTTACCCGGATTGCCTATTGAGGCTACG)
(A GGGCTGAAATGGGTGTAGGAGATCGCCCAGCGAC)
( C G T A C A TCCTGTATCAGGATTGTTATCACCTCGAC)
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(AGGAAAACTATGCATAATTTATGTCACACCTCATG)
(A GTAC G GATAGATTATTCTGTTTTAGCACTACCAC)
(CGTTCAGCAAACGGATACGATTGGCTGACGTCCGA)
(CAAACTCACCGTGGTGCGCTTAAATGACCATGGCT)
( C C G A C A TCCGCGAAATTAATTTTXATATATCCTATC)
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(TAAAACGTAAATGGAGATACCATTCGGCTGGCACT)
(A A TAACTGTAGCATTAGGGTTGGCAGTCACGATTG)
(C C G A C A T C C T TACCTAAGCAATGAACCCCCTCGCA)
(ATTATCCGATCTAACAAATTTGTCTTGACCCTACG)
(C C G ACATCTAACATTAGGGTTGGAGCCCTGCGATG)
(A TAGTATTATGATTGGCGCTTCTATTGAGGCTACG)
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(CAGTTAGCCACCCTTACTGCATTGACAATACTGTG)
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(A GCGTACTTATTATCTTGGGAGTCCCTGCTATAAT)
(AGAGTGCAATATTGATTCTGTTTTAGCACTACCAC)
( $\mathrm{C} G \mathrm{GG} \mathrm{G}$ TATTGTGCATCTTGGGTCACAACAGCACATG)
(ACGGTATTATGCATATCGATTGTGCTTCAAGACCC)
(A ACACGGAAAATGGATCGATTGTTATCACCTCCGA)
( $\mathrm{C} A \mathrm{~A} A \mathrm{~T} A \mathrm{~T} A \mathrm{~A} A C \mathrm{GAAATCAAGTCATTGTGCTATAAT)}$
(A GAGAC GTTTACATATTCTAGGTAGGTATTCCGAC)
( C GCGCGGATAGATTATTCTGTTTTAGCACTACCAC)
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(AGAGCTGAAATGGGTGTAGGAGATAACCCGTATTG)
(A A A TC G G A TAGAT GATTCTGTTTTAGCACTACCAC)
(AGAGTACTTATAGATACAAATATAATCACCTCAAA)
(AGCGC G G A TAGAATATTTGGTTCAGCCTCGGGCCC)
(A GAGTGGCAACATGATTATTCTGGGCCTAGAAGTG)
( T A T G T A C A TCGTCTAGGGAAGT TGAGTTCATCATG)
(ATACTGCCAATGACCCAATTTTGTCACCTAAGAACA)
( $\mathrm{C} G \mathrm{~T} C A C G C G A T C C C T G T G T G G T T C C T C A T T C A A C A)$
(A TAGC G G A TAGATTATTGTTTGTCCTTGCCTCTGA)
(AGGGCTGTAACTCTTACAATACACACTCATTGTAT)
( $\mathrm{C} G \mathrm{G} G \mathrm{~T} A \mathrm{~T}$ T TTTCAGAAGGGCGTTTGAGTCTACCAC)
(C GTTAC GTTTACATATTCTGTTTCTTGACCTCAAG)
(ACGACAGGATGCAGATTAGAGTTAGCCAATATAAT)
(A G GACC GCG G TCA A ATAA GT GAGTACT GCCTCTGA)
( $T A C G T A C A T C G T C C T G T C A G T G A G T A C C C A C C G A G)$
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(CGCAC GATACATAAATATTTAGAGCACCTGCGATG)
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( C G T A C A TCCATATTATAGTAAACATGTGTAACGGA)
(A A G A C T G G T C A T A A C A C G G A A GTCACATCTGCAGC)
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(C G GACGGATAGATTATTTTTCCGCTCTCCCTCTGT)
(ACGGTATTATGCATTTCAAGAGCATAAGACCACGG)
(ATTAACTGTACTAGCTCTGAACAGCTTAAGACAAG)
(A G G A C G G A TAGATTATTTTTCCGCTCTCCCTCTAA)
(C G TACACTATGTCTCCGCAATAACACCCTGCGATG)
( T A C G T A C A TCGTCC TACGGGCATACCACGACGGTG)
(C GCTCAGCCTTTCAT TACATGGTTCCTCCCTGGTA)
(A GATATCCTATATTATAGTTTGTCACCTCATTGCC)
( T A C G T A C A T C G T C C T A G G G G C A C C A C T T C T T T T G C)
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( T A G T T G A T A C A T A A A T A T T T C C G C T C T C A T T G C G A)
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( $\mathrm{C} C \mathrm{GACATCCTTACCTGTGAGTATGTGATATGTCGA)}$
(A A C A C T T T A T GCA GATTAGAGTTAGAGCCTCACCA)
(A GAGATCCTATATTATAGTTTGTCACCTAAGGCTG)
(CAGACTGGTAGCCTTCATTGAGCCCGATGAGTGCG)
(CGTCAGCCGCGAATTTCGCACCACACTCATTGTAC)
(ACGACAGGACACATTAGCCCCGGAGAAATGGCTCC)
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(A ATACGTCCAACAAAATTTAACATTACAGCACAAG)
( $\mathrm{C} A \mathrm{G} G \mathrm{~T} G \mathrm{C}$ C A A A C G G A TCGATTATTCATCACCTCCG)
(ACGGTATTAATCAGTTCATGAGAGAACACCTCATG)
(A GAGTGCCAAACGGATCGATTGATACTTAAGAAAT)
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(A TGAGCTAAAATGGGAGGATGAAACGTAATTCCGC)
(A G A G A C G TTTAACATATACTAAGTGTCGATATGTAC)
(AGGATGCCATGGGCAGAGAAATAACTGTCGTAGGA)
( $\mathrm{C} A \mathrm{G} G \mathrm{~T} G \mathrm{G}$ T C A TC G T T T C A T G A T T A G G T T A T A A T C G)
(TGTACGTTTACAGATTTCATGTGAGACTGGCACGC)
(ATGACGTGTCGTCTAGAGAAATATACTTAAGAAAC)
(A GAGACACGAACATATACTAAGTGTATATAACGCG)
(A A ATGAGGTAACATGATACTCGATCACAGCCGGCA)
(TAAAAGGTTTTCATTACGGGTACAATGATATGTAC)
(A T G A G C T G A A G A T T G G T T T T T G A T A T A TCCAAACA)
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(ATCCAGCCTTTCATTACATGGTTCCTCAGCGATAG)
(CCGACATCTAACATTAGGGTTGGCAGTCACGGTAT)
(AGCGCTGAAAGGAGGAATGGTATTCGCCCAGCGGC)
(CCGATATTTGTGTCTTACATATCTAACAAGCACAAG)
(ATACAACCGTAATTAGCGCAATTCGCCCCCATAAAT)
( T A C G T A C A TCGTCCTAGGGGCACCACTTCGCCTAA)
(ACGACAGGAGATCAGATAAGTGAGTACCCACCGAG)
(AGGGATGAAAGGAGGAATCGATTCGCCCAGCGGCG)
( $\mathrm{T} A \subset \mathrm{~T} T \mathrm{~T} T \mathrm{~A} G A \mathrm{G} G \mathrm{G} A \mathrm{~T} A \mathrm{G} A \mathrm{~T} T \mathrm{C}$ GATCCAATACTGTG)
(ACGGCATGCCTGGACTCGACGACAACATATATATC)
(TAGAACTAATATCTCCACAATATACCTCTATAAAG)
(ACGTTCCGATCTTTCCACAATGTGTCAATATGCTA)
( $C$ G C A T C T G TACTAGTTAGTAGGACTGCACACCACA)
(A T A T T A T T A A C TCTTATTGAGCTTGAGTTATTCAG)
$\left.\begin{array}{lllllllllllllllllllllllllll}(A & T & A & G & C & G & A & A & G & T & A & T & A & A & T & C & C & A & A & C & C & A & A & A & G & C\end{array}\right)$

| 476 | (AACGCTGACCOTGCTGACCTTTGAACCCCCTCGCA) |
| :---: | :---: |
| 477 | (TACTTGTAGAGGGATAGACACCACACTCATTGTAT) |
| 478 | (AGGGCAC G T A G G C T T C A G A C C T A G C T G A A C TCCCGA) |
| 479 | ( T A TACTGAAAGGAAAGTGTGGTTGTCACCGCTGAA) |
| 480 | ( A T A G T G G C T A C TA GA ATCCCA A T A A G T C A A G A C T C) |
| 481 | (AGAGAGGTTTACATATACTA A G T A A T G A T T G C A G A) |
| 482 | ( $\mathrm{A} G \mathrm{~T}$ A C G T T A A C C A G T A A T T T A C T A T T GACCTC A A A) |
| 483 | ( C C G A T A T T G T C A C G T T G T G G A T A A G A G T A T A G G C A) |
| 484 | ( C G T C A C G C G A T C C C T G T G T G G T TCCC C T C T G C G G A C) |
| 485 | ( C C G A C A T C T TA C C T T T T G A A T T TCA GTCATTGGCGA) |
| 486 | ( G A C A C T T A CAC GAA ATCGGA A ACA A GCACTACCAC) |
| 487 | (ATAATGGGCTATCACCTTGTGGTTCCTCAGCGATA A) |
| 488 |  |
| 489 |  |
| 490 | (TACGTTTCAACGGCCTTTCCAATACCCATTCCGAC) |
| 491 | ( $\mathrm{A} C \mathrm{GGT}$ T A C T T A T TAAA T T T A G G A G C C C C C A T T A C A G) |
| 492 | (ACGACATCTAACATTAGGGTTGGCAGTCACGATT G) |
| 493 | ( A G A G A C G T T T A C A T T T T G T G G T T G T C A C C G C T G A A) |
| 494 | ( A G A T A T C C T A T A T T A T A G T T T G T C A C C T A A G G C A G) |
| 495 |  |
| 496 | (A A A T G A C G A T A GCGTTAGA A T TCCCGACAGTGC G C T) |
| 497 | ( $\mathrm{A} G \mathrm{~A} G \mathrm{~T}$ GCCAAACCGGATCGGAAGTCACCTTATTAC) |
| 498 | (ATTATCCGCCTCTA A T A G A T TC G A T C A C T C G T T G T G) |
| 499 | ( G A T G C G G A T A G A T T A T TA T TCATGTC T C A T A C C A T) |
| 500 | ( $\mathrm{A} G \mathrm{G}$ A T G T C A G C C A T A A T T T A T G T A C A T A T C C T A T C) |

average fitness of population $100=0.028$

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NIL
[26]> (ep)
The world needs the DNA sequence (G A T C A G) at the location 9
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Generation 0 population ...

(ACTAAGAATTGGATCACTCAACTATCACCCATTTA) (C G A G T C G C C G G C C C C G G G C T G T G C G C A C T A C T G G G) ( G T G A G A G G T T C G C T A C T A C A T C TA T T T G G G G A T A A) (A A ATTATTCAAATCGCCGATACGATCACCTCAATA) ( G G C G A C A A T A G G C A A A G C GCC T C A G TA G GC G T C G G) ( $G$ T T TCCTTAATGCTGAGTTTGAACTACTCAATGCA) ( $G$ T G T T A A A G T C G T T C A T C G A C C A A G T G G C C G C C G A)
(A C T C C G G T G A A A A A C C A T G TA G A A T G G C T T A TCCA)
( G G T T G TCCAGCAAACCGGACTCCAACGGGTCGAAT)
(TATGTCTAACACCTATCTGGAGCCGAGTAGGATCT)
(T TAGCAGTAGCTGTTGGGGCTCGCGTAGGTGAGGT)
(ACTGC G A T T TA G A T T A T A G G ACCCTAA G GCCCTC G)
( $\mathrm{C} A \mathrm{G} C \mathrm{C}$ T T T C G A T GC G A T A G G A G G T T A G T C A A G C G C)
(TTTCGAGGATAGCTACCGGTCCTTAAATTTTAACG)
(GTACACATGGTCTTAGCCCTAACCCTCTCTCTAAA)
(TCAGTATATCTCTAGCTCCAGCGCTACCAAATCAG)
( G G A GCAAGCATATATCGCAGTTCCGAAACGATCCA)
( G T T A G TATGCTATGTTCCCGTCTACCATAGTCACC)
(ATGCTGTTGACTTTGATTTGGAATTTTGCTACGCC)
( $G$ G GC G A G T G GCTCATA A G G A GC G T T C T T A C T G T G G)
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(TTTTCCACCGGCTATTAAGTCACTATTGCAAGTGC)
(T C A G A G T A T C A C G T C C G C T C A T A C C T G C C G G C A T G)
(TACGTTTAACTCAATGCCCCTCCCCTTAGCAATGA)
(C G GATCTCGTTGAAGAAGACGACAATACCGGATAG)
( $G$ GTGAGCAATGCACTCCCCAGCACCGTCCGTAAGG)
(C GC C T C T T A G GC TCCCCAC T G A ACC T C A CTTTCCC G C)
(TCCGACCGGC GACCGCTACCCCTGAAAATCATGGCC)
( $T$ GCTAATAGCTAGCTAATGTGTCATTAGGATAACG)
(CAC GC G AC GAAAT TCGCATTGTATGCTGCTTCACC)
(CTACCTCATTTTGAGCTTGCATGAAGAAGTTCGCG)
( T GCTGCCCGTTGCTCGCCCCATATGCGAAGGTAGT)
(A GCTGCTATACGTACTTCACCTACGTGACTTGGCG)
(TAGCCCAATCGATCCCCTGGACCGCCCCATAGCCC)
(A ACA G GATGCCGACATAAAGCGTTAAACTTCGTCA)
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(TAACCCCGAAGGGCGTACTCGTTATTTTGGGTTGC)
(T T T T G C A TA TA A G A G A A C G A A T T T T T G TCCGC GTAG)
( G GCAGTCTTTAAGTTATCTCTATACCTGTACCGTA)
(CTCATATCGATTATGGAGAAAGCCGCAGCATGGGT)
( GAGGACCAACTTGTTCCAGTTGGTCTGTACTTTTT)
(CAGTCGGGTAGATCTCGCGATTCATGACGTCGGAG)
(GAATACACGCAGGAACGACAAGCACTATACCGACG)
(CTAGTTCTAGCAGTGGTCGTCGAGTTCTGTACGGC)
(TCGAATATGCGAAACGGGAGACGGTCCCCCAAGCA)
(ACCATGTGACACACATAACTTTTGACCGAGCCCTA)
( $\mathrm{T} \subset \mathrm{C} T \mathrm{G} G A A G T G G A T T C T C G A A A T T G T G T C A C G A T A)$
(A G A A G TA C G A A TAA A GCCCTGCCAATTCTGTGTCC)
( GAGCAAGTTGTCTAGTCGGAGACCTGTACGCCTGT)
( $G A C T A C G G G G G C A T G G C T T A C A C A C G A T G C C G A C G)$
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(ACGGAAGATTAGCTTTGTCGCTGTTGGACCTTTAG)
(GATTTTATTGATCAAGTAATAATACTCTGCGACGT)
( G GAAGGTTGTTCTAGAGCGGCCTGAAAGGAATGCA)
(C C C C A C G T T A C G G G A G T A C A T C T G C T A G G G A G G C G)
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(TAGTCGGACATCCCGCCATAGCTGCATAGTAACTT)
(TTCACTGGCAAGGATCAATTATGGAAACTCGGCCA)
(CTTAA GACTAAAGATTACGTTGAACAAAAAACAAA)
(T TGCAATAGTCTGCTCCGCTCTTGGTCATCGAGCT)
(ACATTACCGTTCGACCTATGGTGAAATGCCGATTC)
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(CGCGGCTA GGAGGTGCTTXTCAGTTGCTGTATTTA)
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(T C C C A C C T A T G A A T GCTCA GCTGT GTCTCCCCTAT)
(ATGGTTGATTACGTGCTCAGCAACTCAGA AGGCCA)
( T G T GCCTAGTAAGGCTTGGTAGGGGCACTGGATGG)
(GTCGACCCCTAAGCAGACAAGGCTGTTAATGCCTT)
( $G$ TAATAATTCTGATAGGTCAAGCATGTAGGAGACC)
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(TCTCCATAGC GTAAGTGTCCGTAGCGAAGGGATTA)
(ATTCCCACGGCCATCAGATGATAGCATAGGCGATT)
( T G T G T G A T A A G T C G T A A C T A T A T T T T A G T G G T A G A)
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(C G TAATGGCAAAACAGGGTTAAACTAAAACCCTTA)
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( T TACATTTCTAACGTATGGCTCGTCGTGATGGAAA)
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(ACGTCCGGGAGAAC GTTCAACTCGTTGCTGCTTCT)
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(TCCTC GACAGCTGACAATCCGTTGTATTCTCGGTC)
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(GGGAA GTGGTCTTCCTTGACAGTTGTACAGAGAAT)
(GAATCGCTGTGTACCAAACGCATTGTGTGCAGTTT)
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(ACAGTTTGTTGTTCAGCTTCGCTACACCGGAAAGG)
(A ACTGCACATGGGTCTCCAAACCCTTGTGGCTATG)
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( $C$ G G G T A A G GAGAAAA A GAGCAAATGGAGGCGGACA)
( $C$ A GATT GATAGCGTACGGC GATCTGTTAGGGGACT)
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(C C G G G TCACTCAT GCCCGCGCGCACTTCCTGTCTG)
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(AGATCGACGTGGAACGCCAGAAACGTGATCACGGC)
(A ACAGTCTATTGCGGTCAGGCGCGTAGAACCCTTA)
(AGTAGCCATACTATCGCAACTGCGTTTCCTATGAG)
( C G TGGGGAATACGGCGGCAAACCCTTAACCCAGGCC)
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( $G G G G C G T C C T C A G A A T T G G G T C G A G G A A G G A T T T T) ~ 0$
(T T A ACACA A A A GACC GGAAGTCGGGAATCCGGTGC) (A ATTTGACACACCAGATACGGTGTAAATTCCTAGG) (CGC GCTGTCCCCC GTGATACGGATCCTTCAAAATT) ( $G G C C A G T A T A G C G G G G T T C T G T G G G T T A A C T T C G C)$
(C T T GACCATTGGGGGGCGTTXAGGGCACATCAGAA)
( GCCTTCCTAGCATGACGTCATATGTCCCATAGGTA)
(C G G GCCTGGGATAGAGGAGTGGAGGGAATATAGAC)
( GCCCTATACCTCGGTGGTATCGCGGAGGGGCTATA)
( G G G TA GCCCCCAGTTCGGCTCGGATCCCTCAGGGC)
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(TACTTX T T C T TA G G T G G TA G A GTCTGC GAAGAACT)
(T TCCTATCTCCCTTCTAAACCTCGAACCGTGGTCA)
( $\mathrm{C} A \mathrm{~T} A \mathrm{~T} G \mathrm{~A} A \mathrm{GA} A \mathrm{ACGGCTCAAAGTGGACAGTTCTCA)}$
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( $G A G G T C A C C A G G A G C C G T C A G A T A G A T T G C G C C T T)$
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(A ACGGAGGCTTTCCAGTTACCCGGTCGGACCCTTA)
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( T T C A C A A TCCAT GTGGAGCC GATGGGTAGTGCTAC)
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(CACCATCGGATGGAACGCGATCGTGCAGCCTACGG)
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( G A TAGAGCCGTTTCGTTGTACATACCGGTGGTGGG)
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(C C C A A C A A TCTGAT T GCCACC GTGGCAACATTCTG)
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( C G GAGCTTAGATTCCTTATTTTCACCGGGAGTTGT)
(C TATATCGTTGGAACGGGATATTTATAGCGCCTCC)
(C C TACCATTTCTGGCTAATTGAATGCTGCACGTTA)
(ATGTGACTTTGATACACGGCGTGTTXGTAGGTCAT)
(ACTGACATCCATACCCAGAGGCGCGCCCCCTCAAA)
(TCTGATGCCTAGCTCGCCAGTGACTGGTCCTTTTT)
( $\mathrm{C} G \mathrm{GC} \mathrm{G}$ C A A A G G G T G G GTGACTCTAAGATTATGTAG)
(ACC GA G GC G A A T T GAGGTTATAGGTC GATACGTAA)
( TCCGCTCTTTATGAC GTCTACGCAGTATCAGTGAG)
( $G T G C C G G T T G G C A T A A C T T C T T C C G C G T A G T A T T C)$
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( $\mathrm{C} G \mathrm{~T}$ GCTATACGATCGGCTGCGCCTAAGCGAAGATA)
(ACGCAGGCCTGGCACGAACTAGGCTAAGGCTATGC)
( $\mathrm{T} A \mathrm{~T} G \mathrm{C} A C \mathrm{GCC} C \mathrm{~T} T \mathrm{~A} G \mathrm{~T} T \mathrm{~A} T \mathrm{~T} T \mathrm{G}$ TCGGCGCTCATGC)
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(T G TCCCCC G GTGTTMACATGCC GGAGGAGAATGGAG)
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(A A G T T G C T A G C T G T G A G T TA G T G T C T T A T T G T G G G)
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( C T C C G C C C C T G A T A T G G A G G C G A G T G A G G T T C G G A)
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(A G G A T A A G T G A G A C C A C A G A G G T G T T T C T C T T G A G)
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( $\mathrm{C} A \mathrm{~A}$ G A T C A T A A T G G C A A C C T G T G T G G G T G G G G A G C)
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( T G T G T ACCACTGTCTCGACTCTGGCCTTGCCTGAG)
(GCCTGTACCGGATGCCAGGCCGCTACGACAAGCTT)
(GAATGAAAAGTAAACTTCGAAAAACAGAGTCGCAC)
(TAACCTACGCTTCGAGGGTTGCAGCAGTCATGGTT)
( $T$ T G T T GAATGGCGGCTAATCGCGATTCTGGCCGGT)
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( T GCGTACTCCAAACAAGGTCGGCCTGACTCTTCCC)
( C TACTATTCTTGACCGCATTTTCGTGAAAATACGA)
(ACC GAAC GTTACCGACCAAGCGCGTAGAGGTCGTT)
(A GTTGTC GCTGTTTTCTGCTGAAGCTCACTGTGTT)
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(A GTTTGCTATAACAAGTGGCGCGCTACGTGTCTCC)
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(C GTTCGTATCAAGAATTGGGCTAATGCCTGGCAGC)
(AAGATAGTTCGGGTGCCAATCCGGAACTAGGCCGG)
( $G$ G G T T TACAGACGTTCGTGGTTGACCATTCTAAAA)
(GGTCTCAACACTGACTTAACCAGGTAACATTGCTG)
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(A TCCTCAGGCTGTTTATGGCGCGGCTCCGCCTGAC)
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average fitness of population $100=0.968$


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(CTGTACCAAGATCAGATTGCGCTATCGACACCGCC)
(C T G T G T TAA GATCAGCTTATGGGATTCAAAACCGA)
(CTGTGTTAAGATCAGCCGCTGCAAACGCGCTGAAC)
(C T G T G T TAAGATCA GCTTGGCGGAACGCACTTTCG)
(ATGTGTTGTGATCAGCTAGGACGGAACATGAGTTC)
(CTGCGTTAAGATCAGCTGACCGCGCGCAGATTACC)
(A T GAACTAAGATCAGTCTTCCTGAGAGGGTCCAGG)
(C T G G G T T A A GATCAGGCGTGC GAAGGCCAGAAATG)
( $G$ T G T G T TAA A A TCA GCC GTGTCTACTCCAACAGGG)
(ATTTGTTAAGATCAGAGATCCCAACGCGCTTCTTA)11
(C T G C G T TAA G A T C A G C T G A C C G C G C G C A G A G A A A G) 1
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(C T GC G T T A A G A TCAGCTGACCGCGCGCAGATTACC)
(GATCGTTTCGATCAGCCCCGACATCACGAGGAGGA)
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(CTGTGTTAAGATCAGCTATGCGGACCACCACTTGG)
(TAGTGTCAAGATCAGCGGTCCTGAGAGGGAGGATT)
(CTGTAC GAAGATCAGCGGGCC GAAAAGC GAATGCG)
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( $G T G T G T T A T G A T C A G G T T G C C T G G A C T G T G C C G A A) 11$
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( $T$ A G T G T T A A GATCAGCCTAC GCCGCTGGAGTAAGA)
(A T G T G T T A A G A T CAGCTTGGCGCCAGGGGTATTTT)
(A T G T G T T A A GATCAGCTTTGGGGGACTCAAACACC)
(CTGTGTTATGATCAGCCTACTCGCACCGGAAACGT)
( $G$ TCTGTTAAGATCAGATTGCTCTAACGGTACTGGG)
(CTGTTCTAAGATCAGCTTCTACTCAAGGTTATATA)
(CTGTGTTAAGATCAGGTCGACCGTGGCGCTGTTTG)
( $\mathrm{C} T \mathrm{GT}$ GTTATGATCAGAAGATGTCGGAAGAGGGCCA)
( C T GC G T T A A GATCAGCGTGGCTAGAGGTACTACCT)
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( $\mathrm{C} T \mathrm{~T} T \mathrm{~T} T \mathrm{~T} A A G A T C A G C T T T G G G G A C A G G C T T A T A C$ (
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(C T G T A A G TA GATCAGCTAGCC GAAAAGCGAATGCG)
(CTGTACGAAGATCAGATTGCCTGAATGCGCTGTTG)11
(CTGTGTTAGGATCAGCTAGGCAGCACGCCGCTGCT)1
(CTGTGTTAAGATCAGCGGTCCAACGCGCTTCTTAG)
( G A T A G T G A A G A TCA G C T T GCC T G G A C T GTTGCCGAA) 1
( G T GC G T C A A G A T C A G A G GC GT GCCCGACCCGATATT)
(CTGTGTTGTGATCAGCTACGCCGACCCCACCTMAT) 1
(CTCTGTTAAGATCAGCTAGGTCCEAACCGAGGAGA) 1
(CTGTGTTAAGATCAGAGCCCGTGACGCCTAGAGGA) 1
(CTGCGTTAAGATCAGCTTATGGGACTCCAGGAGGA) 1
(CTTTXACAAGATCAGCCAGACAGGAAGAGGATCCC)
(CTGTGTTGAGATCAGCCGTGTCTACTCCAACAGGG) 1
(CTGTTGTAAGATCAGCTTGCCAACGCGCTTCTTGG)1
(CTGTGTTTCGATCAGCTTACGCGGAGGGCTGCGGC)
(CAATGTTAAGATCAGCTTGACCGTGAGGCTTATTC)111
(C T G T G T T A A G A T C A G A C C G C G C G A A C C G G A C G A A G) 1
(CTGTGTTAAGATCAGCCTCGTCCGACGGGCGTCCC)1 1
(C T G T G T T A A GATCAGCCTCGCGACAC GCGATTCCC) (CTGAGTTAAGATCAGATTGCCGCAGGCGGATATAC)
( $\mathrm{C} A \mathrm{G}$ T G T T A A G A T C A G C T T T G G G T A C T C A A A C A G G G)
(ATGTACCA A GATCAGCTTGGCATCCGCCACTTGCC)
(CTGAGTTCAGATCAGATTGCCTGAAGCGCTGTTTG)
(CTGTGTTAAGATCAGCTTGACATCATGGGCGTTTC)
(C T G T G T TAA GATCAGCTTCGGGGCACTGCACTTGC)
(T T T T G T T A A GATCAGCCCCGACATAAGGTTAAAAG)
(CTGTGTTAAGATCAGCTGGCGCGACTCCGAGAGGA)
(CTGAGTGAAGATCAGATTGCCGCACAAGAGGCGCG)
(CAATGTTAAGATCAGACGTCCGGACGGGGGTCGGA)
(C T G T A C G A A G A T C A GCCTACTGAGCC GCTTCTTAG)
(C C G T G T T G G G A T CA GCTTTCCGTCCGCCAGAGGAG)
(CTGTGTTAAGATCAGAGAACCGGCCGGGTGATCCC)
(C T G T G T G A C G A T C A G A GCCC GC G AC GCCCCACTCG)
( $C$ T T T G T TAA A ATCA GCTAGACTGCACATCAACACC)
(CTGTGTTGAGATCAGCCGTGCCGAACGCCTTGATA)
(GTGC G T C A A G A T C A G A C G C T C T G A C T G C G C T G T T T)
(CTCTGTTAAGATCAGGTCGACCGTGAGGCTTATTC) 1
(C T GC G T TAA GATCAGCTGACCGCGCGCAGTATGAA)
(CTGTGTTATGATCAGCCCCGTACAACTCCAACAGA)
( C T G T C T T A A GATCAGATTACCAAAGGTCACTGAAG)
(CTGCGTTCAGATCAGAGATGTCGGAAGAGGGCGGA)
(T T G T T T TAA A A TCAGGCGTGCAGTAAAGATGAAAG) 1
(C T A T G T T A A G A T C A G T T C C G A C A T C A C G A G G A G G A) 1
(CTGTGTTAAGAACAGAGCCGCGAAAAGCGAATGCG)
( C TGAGTGAAGATCAGACCGCGCGAATGGAGTATAA)
(CTGTTCTAAGATCAGCTGGACCGTGAGGGAGGATT)
(C T GTGTTGAGATCAGAGCCGAGTAAACATCAACCC)
(GATAGTGAAGATCAGCTTACCAAAGGTCACTTGCT)
( $\mathrm{C} A \mathrm{~A} T \mathrm{GT}$ TATGATCAGCTGTCCTATAAGGTTATGAA)
(CTGTGTTAAGATCAGCTGTCCTGAACCGAGACTTA)11
(GTGTGTTCAAGATCAGTCTACTGACCGCCAGAGGA)
(CTGTGTTAAGATCAGAGTGCTCTAACGGTACTGGG)11
( $G T G T A C C A A G A T C A G A T C C T A C G T G A A C G T A C T T G) 11$
(GTGTGTTAAGATCAGCTTTCCAAAACGATCTCCGC)
(ATGTGTTAAGATCAGCGGTCCAACGCGCATGAAAG)11
(C T G T G T GTT GATCAGCTAGGCCGGAC GCAA GTGCC)
(CTGTACTAAGATCAGAGATGTCAGGAAGAGGCGCG)1
( $G T G C G T T A A G A T C A G A G C C G A T A A C G G G G A G A T T A)$
(ATTTGTTAAGATCAGCCCCTTGAGGGGGAGTATAA)
(C T T T G T TAA GATCAGCTAGGACGGAACATGAGTTC) 1
(C T G T G T G A C G A T C A G C T G A C C GC G C G C A G A T T A C C)
(CTCTGTTAAGATCAGACCGCGCTCCGCCAGAGGAG)
(T T G T G T T G A G A TCA GCC GTGCC GAACGCTTXTTCC) 1
(CTGCGTTAAGATCAGCTGACCGCGCGCAGATTACG)
(CTGTGTTAAGATCAGCCCCGACATAAGCACTGTAG)1
(T TAT T GTTAAGATCAGTTGTCCGGACGGGGGTCTGA)
(CTGTACCAAGATCAGCTTGGCATCCTGCGCTGTTT)
(C T G T G A G A A G A TCA GCTAGTTGAGCCGTAAAGGAA)
(CTCTGTTAAGATCAGCTGTCCTATAAGGTTATGAA)
(CTGTGTTAAGATCAGCTAGTTGAGGGGCAGCGCTG) 1
(C T G A G T C A A G A T C A G C T T G GCA T C C G C C A G A G G A G) 1
(CTGTGTTAAGATCAGCCTAACGGACATGATTGCGA)11
(CTGTATGAAGATCAGACGCTCTGATCGGTGATACC) 1
(CTTTGTTAAGATCAGCTTGGCGCCAGGGGTATTTT)1
(CTTTATCTAAGATCAGTCTTCCTGAGAGGGTCGAC) 0
(CTTTTATCTAAGATCAGCCGTTGTCAACCGAGGGAA)
(CTGTGTTAGGATCAGCTTGGCGGACCCGAGGGTAG)
(CTGTGTTAAGATCAGCCCCGACATCACGAGGAGGA) 1
(CTGTGTTAAGATCAGATTACCAAAGGTCACTTGCC)
( $G T G T G T T A A G A T C A G C T T C G C G A T A C G T A C T A C C T) 11$
(CTGTACCAAGATCAGATTGCCTGAAGCGCTGCTMA)

(CTGC GTTACGATCAGCCCCGACATCACGAGTTTGC)11
(CTGTCTTAAGATCAGCTTGGCATCCGCCAGAGGAG)
(C TAC G T T A A GATCAGCTTGCGATAATCGTTGTCGT)
(CTGTACGAAGATCAGCGGGCCGAAAAGCGAATGAG)
(C T G T G T T A A G A T C A G A G C C T G G G A A C G C T T G T A C C)
(CTGTGTTGAGATCAGCGATCCAAAGGCCATTGCTC)
(ATTTGTTAAGATCAGCCTCGCGCAGGGACCACTCG)
(C T G A G T T A A G A T C A GCTTGC GC G A A C G A T A T GTTT)
(CTCTGTGACGATCAGACCATGGGATCCCAATTACT)
(CTGTGTTAAGATCAGCCTCGCGACAC GCGATTCCC)
(C T G G G G GAAGATCAGATTGCCGCAGGGCACATGTA)

(C T T T T T T A A G A T CA GCTGGACC GTAC G GTTATAAC)
(CTGTGTTGAGATCAGAGATCCGGACGGGTGAACTA)
( $G T G C G T T A A G A T C A G C T T C C C T G A G G G G C T G C G G C)$
( $C$ T GAGTGAAGATCAGATTGCCGCAGTGGCACAGGA)
(CTGAGTGAAGATCAGATTGCCCTAACGGTACTGGG)
(T TATGTTAAGATCAGCTTGACATCACGGGCGTCCC)
(CTGTGTGCCGATCAGCGCCGCAGACTCCGAGAGGA)
(C T G T G T G A A G A T C A G A G GA G G G GACC G G T G A T C T G)
(C TCTGT TAAGATCAGACAGTTGAGCCGTAAAGGAA)
(CTTAGTGAAGATCAGCCTCGCGCGGCGCCGCTGGT)
(CTGTCTTAAGATCAGCTTGACCGGCGCAGATTACC)
(CAATGTTATGATCAGCTGTCCTGAACCGAGACTTA)
(CTGTGTTGTGATCAGCTACGCCGAGGTCACTTGCC)
(CTGTGTTAAGATCAGTCTATGGGACTCCAACAGGG)
(T T G T T T T A A GATCA GCTTGGCA ACCGCCATAGAAA)
(T TATGTTAAGATCAGATTGCCTGAAGCGCTGTTGA)
(CTTTACTAAGATCAGATTGCCACACCGGCGATACC)
(C T A T G T T A A G A T C A G C G G GCC G G A C A T G A T T GC G A)
(T T T T G T TAAGATCAGCCCCGACAAACGACCACTCG)
(C T G T T T TAA GATCA GCTTTGGGGGAACGTCACTGA)
(CTGTACCAAGGTCAGCGTACGCGGTAACGTAATTT)
(ATGTGTTAAGATCAGCCTGACCGCATCAAACACCA) 1
(CTCTGTGACGATCAGAGCCCCAACGCGCTTCTTGG)
(CTCTGCGACGATCAGACTGCTGGCCGGGTGATCGA)
(CTGAGTCAAGATCAGCTTGGCGGACCCGAGGGCCC)11
(C T G T GTCAA GATCAGAGC GGCCGACCCGATGAAGG)
(CTACGTTATGATCAGCTAGTTGAGGGGCACCATCA) 1
(C T C T G T T A A G A T C A GAC GCTCGCTGGAGTCTTCCC)
(CTGTGTTAAGATCAGAGCGGCCGACCCGATGAAGG)
(CTGCGTTAAGATCAGCCTGGCTAGAGGTACTTTTT) 1
(C T G C G T TAA G A T C A G C T G G GCC C G C T C C G A G A G G A) 1
(ATTTGTTAAGATCAGACTCGCGACTCGGTGATACC)11
(C T G T G A G A C G A T C A G C T T G GTC G T A C A T C C A A C A G) 1
(CTGTGTTAAGATCAGCTTTTGGGATCTCAAACAGA) 1
(CTGAGTTAAGATCAGCTTGGGCAAACGACGATCCG) 1
(C T C T G T TA A G A TCA GAC GCGCGC GAACCGGATTXAT)
(CTGTGTGCAGATCAGCTTTGGCGCACCTCTAGAAA) 1
(CTGTGTGTAGATCAGCCCGCGCTCCGCCAGAGGGT)11
(CTGTATTAAGATCAGCTTGACGCACGAGCAACCGA)
(CTGTGTTAAGATCAGCCTACTGAGAAGATCATCCG)1
(CTGTGTTAAGATCAGACTATGGGATCTCAAACAGA)
(CTATGTTAAGATCAGCTAGGCCGTATGACCACGCA)
(ATGTGTTAAGATCAGAGATGTCAGGAAGAGGCCCG)
( $\mathrm{C} T \mathrm{~T}$ TACGAAGATCAGATTGCCTGAAGCGCTGCTGA)
(CTGTGTTGAGATCAGCGTGTCGGAAGGTACTACCT) 1
(CTGTGTTAAGATCAGCTTGCTGGCCGGGTGATCCC)
(CTGTGTTAAGATCAGACGACCGGACCGGCACTTGG) 1
(CTGTGTTTAAGATCAGCCCCGACAACTCCAGGCGG) 0
(CTGCGTTAAGATCAGCTGACCGCGCGGGAGAGGAG)1

$\left.\begin{array}{lllllllllllllllllllllllllllllllll}(C T & G & T & T & C & T & A & G & A & T & C & A & G & C & T & T & C & C & C & G & C & C & A & G & G & G & G & T & A & T & T & T\end{array}\right) 1$

average fitness of population $100=0.968$

