```
                                 (........((((((((((.....))))))((.(((((.......)).....))).).)
chr-1.trna109-Ile-TAT    UAUCUAAAUAUGAAUUGGCAUAA-UGGUU-GUGCUUUGGCCUUAUGAGU----GGAGGGU 54
chr-9.trna90-Ile-TAT     ----------U---UUGGCAUAG-UGGUU-GUGCUUUGGCCUUAUAAGU----GAAAGGU 41
chr-11.trna21-Ile-TAT    ----------U---UUGGCAUAG-UGGUU-GUGCUUUGGCCUUAUGAGU----GGAAGGU 41
chr-2.trna25-Ile-TAT     ----------UGAAUUGGCAUAG-UGGUU-GUGCUUUGACCUUAUGAGU----GGAAGGU 44
chr-10.trna37-Ile-TAT    ----------UGAAUUGGCAUAG-UGGUU-GUGCUUUGGCCUUAUGAGU----GAAAGGU 44
chr-11.trna127-Ile-TAT   ----------UGAAUUGGCAUAG-UGGUU-GUGCUUUGGCCUUAUGAGU----GGAAGGU 44
chr-1.trna33-Ile-TAT     ----------UGAAUUGGCAUAG-UGGUU-GUGCUUUGGCCUUAUGUGU----GGGAGGU 44
chr-2.trna117-Ile-TAT    ----------UGAAUUGGCAUAG-UGGUU-GUGCUUUGGCCUUAUGAGU----GGAAGGU 44
chr-4.trna116-Ile-TAT    ----------UGAAUUAGCAUAA-UGGUU-GUGCCUUGGCCUUAUGAGU----GGAAGGU 44
chr-7.trna13-Ile-TAT     ----------GAAUUGGCAUAA-UGGUU-GUGCUUUGGCCUUAUGAGU----GGAGGGU 43
chr-7.trna113-Ile-TAT    ----------GAAUUGGCAUAG-UGGUU-GUGCUUUGACCUUAUGAGU----GGAAGGU 43
chr-10.trna137-Ile-TAT   G---------UGAAUUGGCAUAG-UGGUU-AUGCUUUGGCCUUAUGAGU----GGAAGGU 45
chr-3.trna39-Ile-TAT     G---------UGAAUUGGCAUAG-UGGUU-AUGCUUUGGCCUUAUGAGU----GAAAGGU 45
chr-3.trna48-Ile-AAT     G--------GCCUAUAAGCUUAGUUGGUUAGAGUGUCGUGUUAAUAACG----CGAAUGU 48
chr-3.trna162-Ile-AAT    G--------GCCUAUAAGCUUAGUUGGUUAGAGUGUCGUGUUAAUAACA----CGAAGGU 48
chr-9.trna85-Ile-AAT     G--------GCUUAUUAGCUCAAUUGGUUAGAGCGUCGUGCUAAUAACG----CGAAGGU 48
chr-9.trna81-Ile-AAT     G--------GCCUAUUAGCUCAGUUGGUUAGAGCGUCGUGCUAAUAACG----CGAAGGU 48
chr-4.trna70-Ile-AAT     G--------GCCCAUUAGCUCAGUUGGUUAGAGCGUCGUGCUAAUAACG----CGAAGGU 48
chr-3.trna160-Ile-AAT    G--------GCCUAUUAGCUCAGUUGGUUAGAGUGUCGUGCUAAUAACG----CGAAGGU 48
chr-4.trna118-Ile-AAT    G--------GCCUAUUAGCUCAGCUGGUUAGAGCGUCGUGCUAAUAACG----CGAAGGU 48
chr-4.trna120-Ile-AAT    G--------GCCUAUUAGCUCAGCUGGUUAGAGCGUCGUGCUAAUAACG----CGAAGGU 48
chr-4.trna80-Ile-AAT     G--------GCCUAUUAGCUCAGUUGGUUAGAGCGUCGUGCUAAUAACG----CGAAGGU 48
chr-4.trna15-Ile-AAT     G--------GCCUAUUAGCUCAGUUGGUUAGAGCGUUGUGCUAAUAACG----CGAAGGU 48
chr-4.trna75-Ile-AAT     G--------GCCUAUUAGCUCAGUUGGUUAGAGCGUUGUGCUAAUAACG----CGAAGGU 48
chr-4.trna82-Ile-AAT     G--------GCCUAUUAGCUCAGUUGGUUAGAGCGUUGUGCUAAUAACG----CGAAGGU 48
chr-8.trna81-Ile-AAT     G--------GCCUAUUAGCUCAGUUGGUUAGAGCAUUGUGCUAAUAAUG----CGAAGGU 48
chr-4.trna4-Ile-AAT      G--------GCCUAUUAGCUCAGUUGGUUAGAACGUUGUGCUAAUAACG----CGAAGGU 48
chr-3.trna75-Ile-AAT     G--------GCCUAUUAGCUCAGUUGGUUAGAGCGUCGUGCUAAUAACG----CGAAGGU 48
chr-9.trna83-Ile-AAT     G--------GCCUAUUAGCUCAGUUGGUUAGAGCGUCGUGCUAAUAACG----CGAAGGU 48
chr-9.trna79-Ile-AAT     G--------GCCUAUUAGCUCAGUUGGUUAGAGCGUCGUGCUAAUAACG----CGAAGGU 48
chr-3.trna197-Ile-AAT    G--------GCCCAUUAGCUCAGUUGGUUAGAGCGUGGUGCUAAUAACG----CCAAGGU 48
chr-6.trna72-Ile-AAT     G--------GCCUAUUAGCUCAGUUGGUUAGAGCGUCGUGCUAAUAACG----CGAAGGU 48
chr-3.trna47-Ile-AAT     G--------GCCUAUUAGCUCAGUUGGUUAGAGCGUCGUGCUAAUAACG----CGAAGGU 48
chr-4.trna52-Ile-AAT     G--------GCCUAUUAGCUCAGUUGGUUAGAGCGUGGUGCUAAUAACG----CCAAGGU 48
chr-3.trna69-Ile-AAT     G--------GCCUAUUAGCUCAGUUGGUUAGAACGUCGUGCUAAUAACG----CGAAGGU 48
chr-4.trna55-Ile-AAT     G--------GCCUAUUAGCUCAGUUGGUUAGAGCGUCGUGCUAAUAACG----CGAAGGU 48
chr-4.trna72-Ile-AAT     G--------GCCCAUUAGCUCAGUUGGUUAGAGCAUCGUGCUAAUAACG----CGAAGGU 48
chr-4.trna86-Ile-AAT     G--------GCCUAUUAGCUCAGUUGGUUAGAGCGUCGUGCUAAUAAUG----CGAAGGU 48
chr-11.trna65-Ile-AAT    G--------GCCUAUUAGCUUAGUUGGUUAGAGUGUCGUGCUAAUAACG----CGAAGGU 48
chr-1.trna47-Ile-AAT     G--------GCCUAUUAGCUCAGCUGGUUAGAGCGUCGUGCUAAUAACG----CGAAGGU 48
chr-3.trna80-Ile-AAT     G--------GCCUAUUAGCUCAGCUGGUUAGAGCGUCGUGCUAAUAACG----CGAAGGU 48
chr-4.trna61-Ile-AAT     G--------GCCUAUUAGCUCAGCUGGUUAGAGCGUCGUGCUAAUAACG----CGAAGGU 48
chr-4.trna78-Ile-AAT     G--------GCCUAUUAGCUCAGCUGGUUAGAGCGUCGUGCUAAUAACG----CGAAGGU 48
chr-11.trna72-Ile-AAT    G--------GCCUAUUAGCUCAGCUGGUUAGAGCGUCGUGCUAAUAACG----CGAAGGU 48
chr-4.trna119-Ile-AAT    G--------GCCUAUUAGCUCAGCUGGUUAGAGCGUCGUGCUAAUAACG----CGAAGGU 48
chr-8.trna76-Ile-AAT     G--------GCCUAUUAGCUCAGCUGGUUAGAGCGUCGUGCUAAUAACG----CGAAGGU 48
chr-4.trna77-Ile-AAT     G--------GCCUAUUAGCUCAGCUGGUUAGAGCGUCGUGCUAAUAACG----CGAAGGU 48
chr-8.trna82-Ile-AAT     G--------GCCUAUUAGCUCAGCUGGUUAGAGCGUCGUGCUAAUAACG----CGAAGGU 48
chr-10.trna86-Ile-AAT    G--------GCCUAUUAGCUCAGUUGGUUAGAGCGUCGUGCUAAUAACA----CGAAGGU 48
chr-4.trna87-Ile-AAT     G--------GCCUAUUAGCUCAGUUGGUUAGAGCGUCGUGCUAAUAACG----CGAAGGU 48
chr-4.trna74-Ile-AAT     G--------GCCCAUUAGCUCAGUUGGUUAGAGCGUCGUGCUAAUAACG----CGAAGGU 48
chr-2.trna46-Ile-AAT     G--------GCCUAUUAGCUCAGCUGGUUAGAGCGUCGUGCUAAUAACG----CGAAGGU 48
chr-7.trna82-Ile-AAT     G--------GCCUAUUAGCUUAGUUGGUUAGAGCGUCGUGCUAAUAACG----CGAAGGU 48
chr-4.trna71-Ile-AAT     G--------GCCCAUUAGCUCAAUUGGUUAGAGCGUCGUGCUAAUAACA----CGAAGGU 48
chr-4.trna76-Ile-AAT     G--------GCCCAUUAGCUUAGUUGAUUAGAGCGUCGUGCUAAUAACA----CGAAGAU 48
chr-3.trna161-Ile-AAT    G--------GCCUAUUAGCUCAGUUGGUUAGAGCGUCGUGCUAAUAACG----UGAAGGU 48
chr-4.trna63-Ile-AAT     G--------GCCUAUUAGCUAAGUUGGUUAGAGUGUCGUGCUAAUAAUG----UGAAGGU 48
chr-1.trna87-Ile-AAT     G--------ACCUAUUAGCUCAGCUGGUUAGAACGUCGUGCUAAUAACG----CGAAGGU 48
chr-2.trna41-Ile-AAT     G--------ACCUAUUAGCUCAGUUGGUUAGAACGUCGUGCUAAUAACG----CGAAGGU 48
chr-4.trna11-Ile-AAT     G--------GCCUAUUAGCUUAGUUGAUUAGAUUGUCGUGCUAAUAACG----CGAAGGU 48
chr-8.trna6-Ile-TAT      G--------GUUCUGUAGCUCAGUUGGUUAGAGCGUUGGUCUUAUGAGC----CGAAGGU 48
chr-6.trna93-Ile-TAT     G--------GUCUUGUAGCUCAGUUGGUUAGAGCGUUGGUCUUAUGAGC----CGAAGGU 48
chr-1.trna50-Ile-TAT     G--------GUCCCGUAGCUCAGUUGGUUAGAGCGUUGGUCUUAUGAGC----CGAAGGU 48
chr-2.trna64-Ile-TAT     G--------GUCCCGUAGCUCAGUUGGUUAGAGCGUUGGUCUUAUGAGC----CGAAGGU 48
chr-3.trna129-Ile-TAT    G--------GUCCCGUAGCUCAGUUGGUUAGAGCGUUGGUCUUAUGAGC----CGAAGGU 48
chr-7.trna96-Ile-TAT     G--------GUCCCGUAGCUCAGUUGGUUAGAGCGUUGGUCUUAUGAGC----CGAAGGU 48
chr-6.trna92-Ile-TAT     G--------GUCUCGUAGCUCAGUUGGUUAGAGCGUUGGUCUUAUGAGC----CGAAGGU 48
chr-6.trna71-Ile-TAT     G--------GUCCCGUAGCUCAGUUGGUUAGAGCGCUGGUCUUAUGAGC----CGGAGGU 48
chr-6.trna94-Ile-TAT     G--------GUUCCGUAGCUCAGUUGGUUAGAGCGUUGGUCUUAUGAGC----CGAAGGU 48
chr-3.trna167-Ile-TAT    G--------GUCCCGUAGCUCAGUUGGUUAGAGCGUUGGUCUUAUGAGC----CGAAGGU 48
chr-7.trna97-Ile-TAT     G--------GUCCCGUAGCUUAGUUGGUUAGAGCGUGGCCUUAUGAGC----CGAAGGU 48
chr-3.trna171-Ile-TAT    G--------GUCUUGUAGCUCAGUUGGUUAGAGCGUUGGUCUUAUGAGC----UGAAGGU 48
chr-9.trna75-Ile-AAT     G--------GCCUAUUAGCUCAGUAGGUUAGAGCGUUGUGCUAAUAACA----CAAAGGU 48
chr-4.trna79-Ile-AAT     G--------GCCUAUUAGCUCAGUUGGUUAGAGCGUUGUGCUAAUAAUG----CGAAGGU 48
chr-4.trna69-Ile-AAT     G--------GCUCAUUAGCUCAGUUGGUUACAGCGUCGUGCUAAUAAUG----UGAAGGU 48
chr-9.trna84-Ile-AAT     G--------GCCUAUUAGCUCACUUGGUUAGAGCAUCGUGCUAAUAACG----UGAAAGU 48
chr-9.trna82-Ile-AAT     G--------GCCUAUUAGCUCAGUUGGUUAGAGCGUUGUGCUAAUAAUA----CGAAGGU 48
chr-4.trna83-Ile-AAT     G--------GCCUAUUAGCUUAGUUGGUUAGAGCGUCGUGCUAAUAACGUACCUGAAGGU 52
chr-4.trna81-Ile-AAT     G--------GCAUAUUAGCUUAAUUGCUUUGAGUGUCAUGCUAAUAAUG----CGAAGAU 48
chr-10.trna121-Ile-GAT   G--------CAGGGAUAGCUCAAUUG-CGAGAGCGUUAGACUGAUGAUC----UGAAGGU 47
chr-3.trna29-Ile-AAT     G--------CUUUCAUAGCUCAAUUGGUUAGAGCACCCGUUUAAUAAGC----GGGAGAU 48
chr-5.trna83-Ile-AAT     G--------CAUCCUUGGCUGAA-UGGUUAAAGUGCCCAACUAAUAAUUG----GCUAAUU 48
chr-4.trna13-Ile-TAT     A--------AUUACUUAACUCAG-UGGUUAGAGUAUUGCUUUUAUACGG----CGGGAGU 47
                                 .........10........20........30........40........50.........
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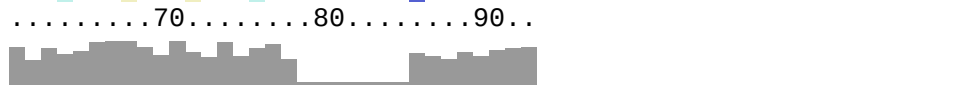

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                                 )(((((((...)))))))).......)))))))).
chr-1.trna109-Ile-TAT    CACGGGUUCAAACCUUGUU------AGAUAA-- 79
chr-9.trna90-Ile-TAT     CACGGGUUCAAAUCUUGAU------GGGCAAAG 68
chr-11.trna21-Ile-TAT    CACGAGUUCAAACCUUGGU------GGGCAAAG 68
chr-2.trna25-Ile-TAT     CACUGGUUCAAACCUUGGU------GGGCAAAG 71
chr-10.trna37-Ile-TAT    CACGAGUUCAAACCUUGGU------GGGCAAAG 71
chr-11.trna127-Ile-TAT   CACAGGUUCAAACCUUGAU------GAGCAAAG 71
chr-1.trna33-Ile-TAT     CACAGGUUCAAACCUUGAU------GGGCAAAG 71
chr-2.trna117-Ile-TAT    CACGGGUUCAAACCUUGAU------GGGCAAAA 71
chr-4.trna116-Ile-TAT    CACAGGUUCAAACCUUGGU------GGGCAAAG 71
chr-7.trna13-Ile-TAT     CACGAGUUCAAAUCUUGUU------AGAU-ACG 69
chr-7.trna113-Ile-TAT    CACGAGUUCAAACCUUGUU------AGAG-GUA 69
chr-10.trna137-Ile-TAT   CACAGGUUCAAACCUUGAU------AGAC-ACG 71
chr-3.trna39-Ile-TAT     CAUGAGUUCAAACCUUGGU------AGAC-A-- 69
chr-3.trna48-Ile-AAT     UAUAAGUUUAAGACUUGC-------AUCGGCCA 74
chr-3.trna162-Ile-AAT    UGUAGGUUUAAGACUUGC-------AUGGGCCA 74
chr-9.trna85-Ile-AAT     CGCAGGUUCAAGACCUAC-------AUUGGCCA 74
chr-9.trna81-Ile-AAT     CGCAGGUUCGAGACCUAC-------AUGGGCCA 74
chr-4.trna70-Ile-AAT     CGCAAGUUCGAGACCUGC-------AUGGGCCA 74
chr-3.trna160-Ile-AAT    UGCAAGUUUGAGACCUGC-------AUGGGCCA 74
chr-4.trna118-Ile-AAT    CGCUGGUUCGAGACCUGC-------AUGGGCCA 74
chr-4.trna120-Ile-AAT    CACAGGUUCGAGACCUGC-------AUAGGCCA 74
chr-4.trna80-Ile-AAT     CACAGAUUCGAGACCUGU-------AUAGGCCA 74
chr-4.trna15-Ile-AAT     CACAGGUUCGAGACCUGU-------AUAGGCCA 74
chr-4.trna75-Ile-AAT     CGCAGGUUCGAGACUUGC-------AUGGGCCA 74
chr-4.trna82-Ile-AAT     CACAAGUUCGAGACUUGU-------AUAGGCCA 74
chr-8.trna81-Ile-AAT     UACAGGUUCGAGACCUGU-------AUAGGCCA 74
chr-4.trna4-Ile-AAT      CACAGGUUCGAGACCUGU-------AUAGGCCA 74
chr-3.trna75-Ile-AAT     CGCAGGUUCGAGACCUGC-------AUGGGCCA 74
chr-9.trna83-Ile-AAT     CGCAGGUUCGAGACCUGC-------AUAGGCCA 74
chr-9.trna79-Ile-AAT     CGCAGGUUCGAGACCUGC-------AUGGGCCA 74
chr-3.trna197-Ile-AAT    CGCAGGUUCGAGACCUGC-------AUGGGCCA 74
chr-6.trna72-Ile-AAT     CGCAGGUUCGAAACCUGC-------AUAGGCCA 74
chr-3.trna47-Ile-AAT     CGUAGGUUCGAGACCUGC-------AUGGGCCA 74
chr-4.trna52-Ile-AAT     CGCAGGUUCGAGACCUGC-------AUGGGCCA 74
chr-3.trna69-Ile-AAT     CGCAGGUUCGAGACCUGC-------AUAGGCCA 74
chr-4.trna55-Ile-AAT     CACAGGUUCAAGACCUGU-------AUAGGCCA 74
chr-4.trna72-Ile-AAT     CGCAGGUUCGAGACCUGC-------AUGGGCCA 74
chr-4.trna86-Ile-AAT     CAUAGGUUCGAGACCUGU-------AUAGGCCA 74
chr-11.trna65-Ile-AAT    CACAGGUUCGAGACCUGU-------AUAGGCCA 74
chr-1.trna47-Ile-AAT     CGCAGGUUCGAGACCUGC-------AUGGGCCA 74
chr-3.trna80-Ile-AAT     CGCAGGUUCGAGACCUGC-------AUGGGCCA 74
chr-4.trna61-Ile-AAT     CGCAGGUUCGAGACCUGC-------AUGGGCCA 74
chr-4.trna78-Ile-AAT     CGCAGGUUCGAGACCUGC-------AUGGGCCA 74
chr-11.trna72-Ile-AAT    CGCAGGUUCGAGACCUGC-------AUGGGCCA 74
chr-4.trna119-Ile-AAT    CGCAGGUUCGAGACCUGC-------AUGGGCCA 74
chr-8.trna76-Ile-AAT     CGCAGGUUCGAGACCUGC-------AUGGGCCA 74
chr-4.trna77-Ile-AAT     CGCAGGUUCGAAACCUGC-------AUGGGCCA 74
chr-8.trna82-Ile-AAT     CGCAGGUUCGAAACCUGC-------AUGGGCCA 74
chr-10.trna86-Ile-AAT    CACAGGUUUGAGACCUGU-------AUAGGCCA 74
chr-4.trna87-Ile-AAT     CAUAGGUUUGAGACCUGU-------AUAGGCCA 74
chr-4.trna74-Ile-AAT     CGCAGGUUUGAGACCUGC-------AUGGACCA 74
chr-2.trna46-Ile-AAT     UGCAGGUUCGAGACCUGC-------AUGGGCCA 74
chr-7.trna82-Ile-AAT     CACAGGUUUGAGACCUGU-------AUAGGCAA 74
chr-4.trna71-Ile-AAT     UGCAGGUUUGAGACCUGC-------AUGGGCCA 74
chr-4.trna76-Ile-AAT     CACAGGUUCGAGACCUGC-------AUGGGCCA 74
chr-3.trna161-Ile-AAT    UGCAGGUUCAAGACUUGC-------AUGGGCCA 74
chr-4.trna63-Ile-AAT     CACAGGUUUGAGACCUGU-------AUAGGCCA 74
chr-1.trna87-Ile-AAT     UGCAGGUUCGAGACCUGC-------AUGGGCCA 74
chr-2.trna41-Ile-AAT     CACAGGUUCGAGACCUGU-------AUAGGCCA 74
chr-4.trna11-Ile-AAT     CAUAGGUUCAAGACUUGU-------AUAGGCCA 74
chr-8.trna6-Ile-TAT      CGUGGGUUCGAGCCUUGC-------CGGAACCA 74
chr-6.trna93-Ile-TAT     CGUGAGUUCGAGCCUCGC-------UGGGACCA 74
chr-1.trna50-Ile-TAT     CGCGGGUUCGAGCCCCGC-------CGGGACCA 74
chr-2.trna64-Ile-TAT     CGCGGGUUCGAGCCCCGC-------CGGGACCA 74
chr-3.trna129-Ile-TAT    CGCGGGUUCGAGCCCCGC-------CGGGACCA 74
chr-7.trna96-Ile-TAT     CGCGGGUUCGAGCCCCGC-------CGGGACCA 74
chr-6.trna92-Ile-TAT     CGCGAGUUCGAGCCUCGC-------CGGGACCA 74
chr-6.trna71-Ile-TAT     CGCGAGUUCGAGCCUCGC-------CGGGACCA 74
chr-6.trna94-Ile-TAT     CGCGAGUUCGAGCCUCGU-------CGGAACCA 74
chr-3.trna167-Ile-TAT    CGCGAGUUCGAGCCUCGC-------CGAGACCA 74
chr-7.trna97-Ile-TAT     CGCGGGUUCGAGUCCCGC-------CGGGACCA 74
chr-3.trna171-Ile-TAT    CGCGGGUUCAAGCCCCGC-------CAGGACCA 74
chr-9.trna75-Ile-AAT     CAAAGGUUUGAGACCUGU-------AUAGGCCA 74
chr-4.trna79-Ile-AAT     UACAGGUUCGAGAUCUAU-------AUAGGCCA 74
chr-4.trna69-Ile-AAT     CGCAAGUUCAAGACCUGC-------AUGGGCCA 74
chr-9.trna84-Ile-AAT     CGCAAGUUCGAGACCUGC-------AUGGGCCA 74
chr-9.trna82-Ile-AAT     CGCAUGUUCGAGACCUGC-------AUGAGCCA 74
chr-4.trna83-Ile-AAT     UACAGGUUCAAGACCUGU-------AUAAGCCA 78
chr-4.trna81-Ile-AAT     GGCAGGUUCAAGUCCUGC-------AUAAGCCA 74
chr-10.trna121-Ile-GAT   CACGUGUUCGAUCGAUGU-------UUACUGCA 73
chr-3.trna29-Ile-AAT     CUUGAUUUCAAAUCUCAAUAUUCAAUGAAAGCA 81
chr-5.trna83-Ile-AAT     CGUAGGUUCAAUUCCUAC-------UGGAUGCA 74
chr-4.trna13-Ile-TAT     CAUUGGUUGAAAUCCAAU-------AGUAGGUA 73
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