Project 1

Names: Liz Wyman Z1884762

Kleo Bano Z1940978

Chris Troyer Z1945059

Roberto Rivas Z1906735

Programming language: Java

Approximate programming time:

Contribution: Liz – report writing 25 %

Kleo - design of the program, implementation/debugging/documentation 25 %

Chris - design of the program, implementation/debugging/documentation 25 %

Roberto - report writing 25 %

Rat

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | A | T | C | G | - |
| Human | A | 1641613 | 139457 | 158974 | 420983 | 355666 |
| T | 138895 | 1637968 | 418407 | 158531 | 353909 |
| C | 155283 | 454576 | 1661408 | 139773 | 376838 |
| G | 455544 | 155086 | 140146 | 1661828 | 376545 |
| - | 171456 | 173351 | 162285 | 159916 | 0 |

Cat

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | A | T | C | G | - |
| Human | A | 3263350 | 181420 | 258066 | 753715 | 447392 |
| T | 180412 | 3248333 | 754327 | 256705 | 445946 |
| C | 207697 | 619058 | 3160212 | 217869 | 448210 |
| G | 616529 | 206417 | 217943 | 3161651 | 447427 |
| - | 315999 | 315381 | 338147 | 338646 | 0 |

Chimpanzee

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | A | T | C | G | - |
| Human | A | 8437370 | 15009 | 21194 | 87237 | 42827 |
| T | 14967 | 8396958 | 86950 | 20966 | 42552 |
| C | 20030 | 89700 | 7746245 | 25035 | 24932 |
| G | 90437 | 19690 | 25159 | 7736116 | 24075 |
| - | 42239 | 42074 | 25390 | 25430 | 0 |

Based on the results it is simple to say that humans and chimpanzees have a closer evolutionary relationship than humans compared to rats or cats. That is because based on the alignment there are a higher number of matches over mismatches. If we are comparing evolutionary closeness the next closest species would be cat and human followed by rat and human.

Additionally, the substitution rate shows