Summary

We firstly calculate the percentage identity between human and mouse DNA sequences, human and random DNA sequences, mouse and random DNA sequences. Here are the results printed in proper order:

Human-mouse: 89.64%

Human-random: 5.41%

Mouse-random: 5.86%

We can know that the DNA sequences in human and mouse have a high degree of similarity. Then, we use BLOSUM62 matrix to get alignment scores between each two DNA sequences. There are also the results of this:

Human-mouse:1091.0

Human-random: -55.5

Mouse-random: -44.5

We can learn from them that the score between human and mouse DNA sequences are the highest and the other two scores are all minus numbers. From the two results above and some evolutionary knowledge, we can guess that the closer the two organisms are genetically related, the higher their alignment scores of their DNA sequences will be. Therefore, the BIOSUM matrix can help determine the genetic relationship between different organisms.