Bioinformatics Midterm Prep Questions

Which of the following is true regarding genome rearrangements?
A. They occur frequently in evolution.
B. They are often responsible for erecting species barriers.
C. They can trigger speciation events.
D. Closely related organisms show fewer genome arrangements than more distantly related organisms
E. All of the above.

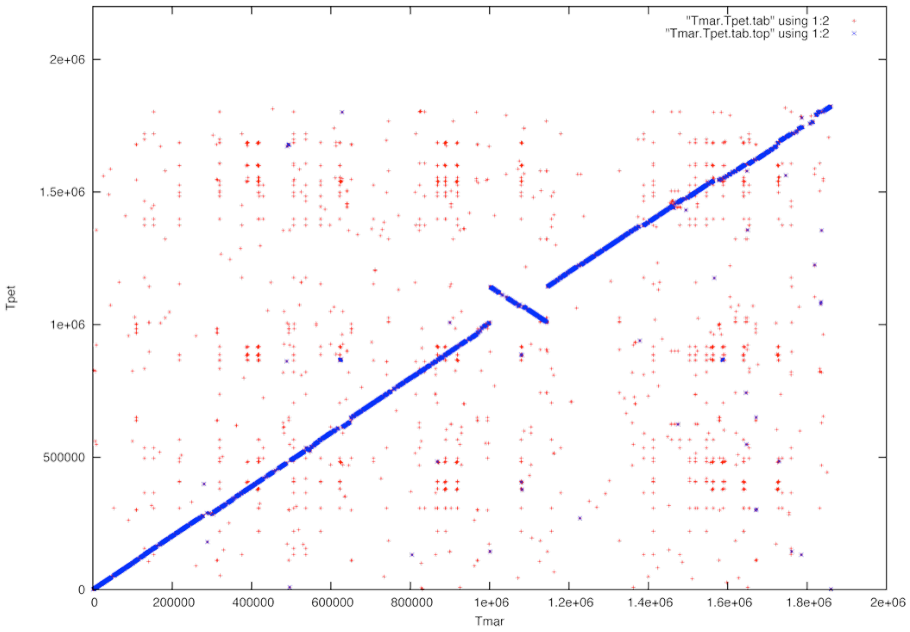
True/False In BLAST searches using only a single genome as target, proteins have more than one match because of paralogs.

What is GC strand bias (based on location with respect to the origin and terminus of replication)?
A.There are more GC dinucleotide simple repeats near the origin.
B. The G versus C content of the leading strand versus lagging strand changes.
C. The CG versus AT content of a genome changes.
D. The GC versus AT content of the leading strand versus lagging strand changes.
E. None of the above.

Which of the following is NOT an advantage of performing BLAST on the command line?
A. It is easy to BLAST an entire genome against another entire genome
B. The same script to perform command line BLAST searches can be reused anytime one wants to add a BLAST step to a pipeline.
C. It is simple enough for anyone, even people with no computer skills, to point and click their way to results.
D. It is possible to write a script to run 100,000 BLAST searches in one go
E. Scripted BLAST searches can be put into a pipeline with other computer scripts, to perform a complex task for you, leaving one free to do other things

In the unix operating system, which command would one use to check which files are in the current directory?
A. ls B. cat C. pwd D. cd E. qlogin

In the unix operating system, which command would one use to enter a subdirectory?
A. ls B. chmod C. pwd D. cd W. qlogin
For Questions 21 through 24, refer to the following graph

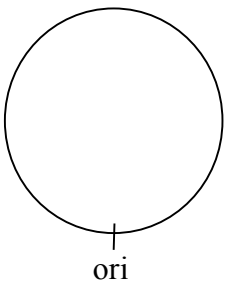


What mechanism is this graph depicting when blue dots appear on the downward sloping diagonal?
A. Translocation
B. Deletion or Insertion
C. Neofunctionalization
D. Inversion
E. All of the above

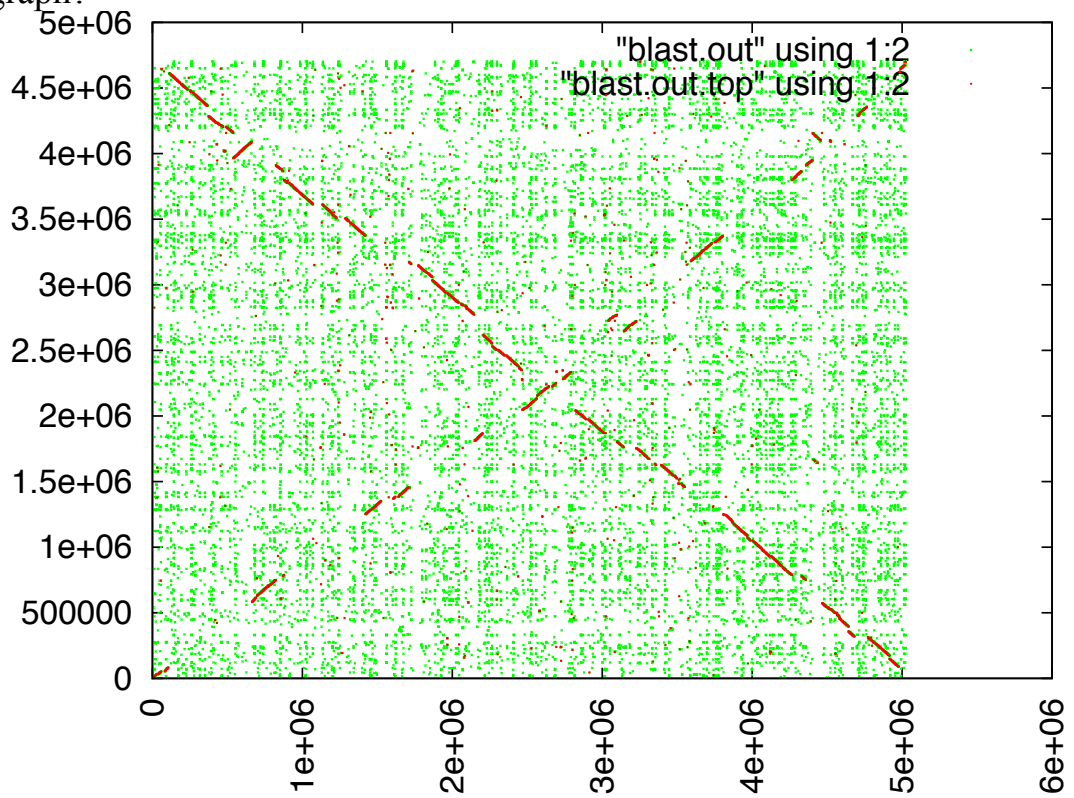
What mechanism is this graph depicting when there is a gap in the blue line, with the blue line picking up a notch higher or lower on the y-axis after the gap?
A. Translocation
B. Deletion or Insertion
C. Neofunctionalization
D. Inversion
E. All of the above

After plotting the blast hits from the two genomes, what does the blue line represent?
A. The location of all genes in one genome versus the location of ALL the blast hits in the other genome
B. The location of all genes in one genome versus the location of the top scoring blast hit in the other genome
C. The location of the gene in the environment
D. A and B
E. None of the above

Map the genome rearrangement shown onto the circular genome below:



How many genome rearrangement events are needed to produce the following graph?



A. 1 B. 2 C. 3 D. 4 E. 5 F. 6 or more

Selection for function can preserve sequence similarity in the pairwise comparison of homologous proteins, across domains separated by how many years of independent evolution?

A. Thousands
B. Millions
C. Billions
D. Limited only by how long life has existed
E. All of the above