Self-study questions – Week 1

These study questions are derived from lecture notes in the course IN4030. The answers are usually found inside the lectures notes. The questions are given to students as a way to learn important concepts in the course. Students can for example quiz each other using these questions before the final exam.

Lecture 1

1. What does it mean that DNA is anti-parallel?
2. Why is it an advantage that DNA is double stranded?
3. Which 3 parts does a nucleotide consist of?
4. What are complementary bases?
5. What are purines?
6. What are pyrimidines?
7. What is the direction of DNA, and why?
8. What do we mean by ”upstream” and ”downstream”?
9. What are histones, chromosomes and genome?
10. What is the translation?
11. What is a codon?
12. What are the differences between DNA and RNA?
13. What is a protein?
14. What do each amino acid consist of?
15. What are the five different groups of amino acids?
16. What is a peptide bond?
17. What is the primary structure of a protein?
18. What is the secondary structure of a protein?
19. What is the tertiary structure of a protein?
20. What is the quarternary structure of a protein?

Lecture 2

1. What is the DNA alphabet? The RNA alphabet? The protein alphabet?
2. Why is it interesting to look at sequence alignments?
3. Why are dot plots useful when looking at sequences?
4. How can you identify internal repeats in a dot plot?

5. Show an example of a dot plot with identical sequences.
6. Show an example of a dot plot of an alignment with several gaps.
7. Show a dot plot showing an alignment of inverted segments?
8. What is the edit distance?
9. What does a low edit distance indicate?
10. What are the 4 fates for a symbol during evolution?
11. What is an ”indel”?