Exercise 1 *The human genome consists of 23 pairs of chromosomes. Perform a literature search to find out how many chromosomes there are in the genomes of the following organisms:*

(a) Chimpanzee (Pan troglodytes)

(b) Dog (Canis familiaris)

(c) Mouse (Mus musculus)

(d) Chicken (Gallus gallus)

(e) Cow (Bos taurus)

(f) Zebrafish (Danio rerio)

(g) Yeast (Saccharomyces cerevisiae)

(h) Rice (Oryza sativa).

Exercise 2 *Give the reverse complement (i.e. Watson-Crick complementary sequence in reverse order) of the following sequences:*

(a) TAGCTGATCTATCTCGCGCGCCGCATTATCGTATTCTCAGTGATCTCT

(b) ATGGATTTATCCTTGCGCGCGCATTTTCGCTCATCTAGGTGTCTATGC

Exercise 3 *Compute the binomial coefficients* nC_r *for* $0 \leq n \leq 5$ *and* $0 \leq r \leq n$

Exercise 4 *Implement the quick sort algorithm in your favorite programming language.*

Exercise 5 *Write an algorithm to calculate selected Fibonacci number in your favorite programming language.*

Exercise 6 *Write an algorithm to compute the entropy of a DNA sequence. Implement the algorithm in your favorite programming language. Obtain a DNA sequence and use your program to calculate the entropy of the sequence. Report the results.*

Exercise 7 *Write a program to read in FASTA file, reverse complement the sequence(s) in the file and write the results into another well-formed FASTA file. Do not allow the lines of the output file to exceed 60 characters in length (except possibly for the defline)*