Elements of Statistics and Probability

Exercises using R: Different types of objects - Functions

1. The following 2 x 2 x 2 x 2 contingency table summarizes the frequency for each combination of levels of four different variables:

(1) Density	(2) Sex of subject	(3) Sex of intruder	(4) Response	
			Yes	No
Low	Male	Male	18	1
		Female	15	8
	Female	Male	17	5
		Female	12	7
High	Male	Male	13	6
		Female	16	4
	Female	Male	10	9
		Female	14	6

i) Enter the above data into R as an array
ii) Enter the above data into R as a matrix
iii) Enter the above data into R as a data frame
iv) Which approach is best in your own opinion?
v) From each type of objects created in (i)-(iii), extract the number of female intruders
vi) From each type objects created in (i)-(iii), extract and print the characteristics of all male subjects

2. The Fibonacci sequence is of special interest in mathematics and other scientific fields. The Fibonacci numbers are defined retrospectively as follows:

$$F_n = F_{n-2} + F_{n-1}$$

i.e. each number is the sum of the two preceding ones. Moreover, it holds that $F_0 = 0, F_1 = 1, F_2 = 1$. The beginning of the sequence is thus 0, 1, 1, 2, 3, 5, 8, 13,… Write a function which takes as input *n* (assuming that *n* is an integer) and returns the corresponding Fibonacci sequence. For example, if we name the function *fib*, then *fib*(4) will return the sequence 0, 1, 1, 2, 3, *fib*(9) will return the sequence 0, 1, 1, 2, 3, 5, 8, 13, 21, 34 etc.