



## Data Structures - Lab 2

14-10-2020

### Note:

- This is a strictly individual work. Sharing the solution with each other will be considered as violation of the honor code and any suspicious activity may be referred to the disciplinary committee. In case of any help, please consult the instructor.
- You can't use any built-in function to implement following tasks.

**Submission Deadline: 16 October 2020, 11:55 PM**

**Total Marks: 30**

---

### Exercises

1. Recall the "Building Block" strategy discussed in class. Using this strategy:
  - a. Implement "insert" algorithm as building block (as a function).
  - b. Implement "Insertion Sort" algorithm using "insert" as the building block.
  - c. Test your program on 10 integers taken as input from user.
2. Recall the "Building Block" strategy discussed in class. Using this strategy:
  - a. Implement "moveMin" algorithm as building block (as a function).
  - b. Implement "Selection Sort" algorithm using "moveMin" as the building block.
  - c. Test your program on 10 integers taken as input from user.
3. Greatest Common Divisor (*GCD*) of two integers  $n$  and  $m$  is the largest integer which divides both of  $n$  and  $m$ . It can be computed using recursive division as shown below (Euclid's algorithm):

$$\begin{array}{r} 14 \overline{) 18} \quad 1 \\ \underline{14} \phantom{00} \\ 4 \overline{) 14} \quad 3 \\ \underline{12} \phantom{00} \\ 2 \overline{) 4} \quad 2 \\ \underline{4} \\ 0 \end{array}$$

Write Python function  $GCD(n, m)$  where  $n \geq m$ .

Relatively prime integers are the integers whose *GCD* is 1. Using the  $GCD(n, m)$  function as the building block, write a function  $rel\_prime(n)$  which will compute the probability that two randomly chosen integers lesser than a given integer  $n$  will be relatively prime. User will call this function and pass the input.