BIL 101 – Introduction to Computer Science
HW 7

Due to 25.11.2015, 13:00

Submit your hardcopies to Necmeddin ÇARKACI (122). Strictly no hardcopy will be accepted after 13:00

PART 1 :

a) Complete below function which get min, max and count parameters and produces random numbers between min, max values, and write them in a file.

```
import random
def createRandomNumberFile(min, max, count, outputFileName):
        outputFile = open(outputFileName, "a+")
        for item in range(0, count):
                randomNumber = random.randint(min,max)
                .
                .
                .
                .
```

b) Implement the linear search, binary search and insertion sort algorithms (given in the textbook) in python

c) Write a python script which uses *createRandomNumberFile()* function which defined in section a to create a file which include integer numbers. Read the file into a list and sort it using insertion sort. Use Linear Search and Binary Search to find any value in the list. Use python timeit module and compare these two algorithm's runtime. (for usage of timeit check moodle BIL 107 page).

d) Discuss best and worst-case efficiency of the algorithms.

PART 2 :

a) What is algorithm, program and process? What differences and relation among them?

b) What is the difference between syntax and semantics?

c) Convert the pseudocode routine

```
Z = 0
X = 1
While (X < 6) :
        Z = Z + X
        X = X + 1
```

to an equivalent routine using a repeat statement.

d) Given a while loop design a pseudocode that performs the same operation using repeat-until loop. Similarly, given a repeat-until loop design a pseudocode that performs the same operation using while loop.

e) Design an algorithm for finding all the factors of a positive integer. For example, in the case of the integer 12, your algorithm should report the values 1, 2, 3, 4, 6, and 12