İstanbul Bilgi University
Department of Computer Engineering
CMPE 100: Introduction to Computing
2019/2020 Fall - Final Quiz (Duration: 75 minutes)

1	2	3	4	5	6	TOTAL

Student Name: ________________________Student Number: ____________

The phrase "design this function/program" means that you should apply the design recipe. Each step of your design will be graded. However, a program with no demonstration of design stages will not be graded.

Questions : In each of the questions below write the function to produce the output according to problem statement. Make sure to include cases in which program must produce an error. Also put data definitions, contract and test cases (i.e. check-expect tests) in your programs. You need to add documentation comments only if you find them necessary to describe your approach.

1.(10pts) Design and instantiate a Employee data structure where each structure consists of an ID, Salary and Department information. ID and Salary are represented by natural numbers, Department is String.

2. (15pts) Design and implement **a recursive function** named **findSalary** which consumes a list of Employee structure and a Employee ID, then the function returns the salary of given Employee ID.

3. (20pts) Design and implement **a recursive function** named **findDeptList** which consumes a list of Employee structure and a department information and produces list of Employee IDs in that particular department.

4. (20pts) Design and implement **an accumulator style function** named **sumSalary>3000** which consumes a list of Employee structures and produces sum of Salary greater than 3000.

5. (15pts) Use proper **abstract list processing functions** to complete question4.

Contract for abstract functions for list-processing:

filter: [X → Boolean] [List-of X] → [List-of X]
map: [X → Y] [List-of X] → [List-of Y]
foldr/foldl: [X Y→ Y] Y [List-of X] → Y

6.(20pts) Design and implement **a recursive function** named **howManyTimes** which consumes a list of numbers and a number. It produces how many times given number is in list.

(check-expect (howManyTimes 3 (list 1 2 3 1 3 3 4 2 3)) 4)
(check-expect (howManyTimes 6 (list 1 2 3 1 3 3 4 2 3)) 0)