COMPUTER PROGRAMMING

2016-2017 FALL TERM

HOMEWORK #8

Due Date : 15.12.2016 ; 23:55

1. a) Write a recursive function to calculate binary representation of an integer N.

Example: 12 / 2 = 6 → remainder = 0
6 / 2 = 3 → remainder = 0
3 / 2 = 1 → remainder = 1
1 / 2 = 0 → remainder = 1

The binary representation of "12" is 1100.

b) Write a recursive function to evaluate following mathematical function.

$$F(x,y) = \begin{cases} F(x-1, y) + F(x, y-1) + x + y & \text{if } x,y > 0 \\ 0 & \text{otherwise} \end{cases}$$

2. In this part you are given an NxN string array (a maze) that contains 1's and 0's. Write a C code that finds a path from (0,0) location to (N,N) recursively; following 1's in the array.

- You will read the maze from a file "maze.txt"
- You cannot travel crosswise in the maze.
- There is only one way to get out of the maze.
- You will print the maze on the screen with **"*"** instead of 1's of the path you found.

Example :

Input :

```
1 1 1 1 0
1 0 1 0 0
1 0 1 0 0
1 1 0 0 0
0 1 1 1 1
```

Output :

```
* 1 1 1 0
* 0 1 0 0
* 0 1 0 0
* * 0 0 0
0 * * * *
```

RULES:

1. Obey honor code principles.

2. Read your homework carefully and follow the directives about the I/O format (data file names, file formats, etc.)

and submission format strictly. Violating any of these directives will be penalized.

3. Obey coding convention.

4. Your submission should include the following files and NOTHING MORE (no data files, object files, etc) : HW8_1_a_<firstname>_<lastname>.c
HW8_1_b_<firstname>_<lastname>.c
HW8_2_<firstname>_<lastname>.c
Do NOT compress the files you submit.

5. Do not use non-English characters in any part of your homework (in body, file name, etc.).

6. Deliver the printout of your work until the last submission date.