HACETTEPE UNIVERSITY

DEPARTMENT OF COMPUTER ENGINEERING

Student

Name : Natig

Surname : GAHRAMANOV

Student ID : 21305753

Department : Computer Engineering

Homework

PROGRAMMING ASSIGNMENT 1

Subject : Data Structures and Algorithms

Advisor : R.A. Alaettin UÇAN

Program language : C

PROBLEM

We want to find treasure and what we need we have. A map and a key. But the key don't show us directly where treasure. We have to trip map about key show us where is our next step. We have to be careful cause don't miss map. Anyway we can get out the map. So we lost where we are.

METHOD AND SOLUTION

First all things, we have to take what giving us , So I write my first function *(void findsize(char sizesmatrix[],char sizekey[] ,int * rowsize,int *columnsize,int *mykeysize).* Which one take first and second input from user. The first input have two value and I have to split it, when I did it rowsize and columnsize variable take this the values was giving. After that I set key size to mykeysize variable. After this function I have row, column and key size. Now we know which matrixes we needed.

We need put values of .txt files into matrixes. For that we need memory, I open a integer pointer and allocate memory as a row then I needed to allocate memory for column too, So I allocate memory for every row as column size. Then our memory ready up for put values in to it. Before put values in to matrixes, we need read .txt files so I write a function like that *void (readfile(char filename[] ,int row,int colunm ,int **mymap))* which one take input filename row size, column size and matrix. This function read .txt file and put all value in to matrix as how required. So I call this function *readfile(argv[3],myrowsize,mycolumnsize,mymap);* After calling this, our matrix of map was ready. Then I build like this key matrix *readfile(argv[4],mykeysize,mykeysize,mykey);*

After all thing we just need to trip map step by step. But we have to know where we are in the map. So I used structure (*struct Point{ int x; int y; })* this structure store my current

location on the map. And I initialize this structure start point as (0,0). *(void trip(int **map,int **key,struct Point point,int keysize,int row,int colunm,FILE *output)).* This function get map matrix, key matrix, current location, size of key, size of row, size of column and file (which one write our step(s)).In this function we have calculate where we go so I multiple key matrix and map matrix (not all just where our current region same row and column size of key matrix, same location integer multiple with each other), Then I sum all this value. I divide this sum to 5 and get remaining this process. Then according to this remainder I move to up, right, left and down (of course when we move to in the map I check we get out the map or not if the result say get out the map we step reverse it.). If reminder was zero we got gold otherwise I called this functıon again. Meaning that's our recursion function. In this functıon I also write .txt file center of my current matrix on the map. So problem was solved.

In this assignment I learn how a allocate memory in C programming language. Also working principle of recursion function. Also reading file method I saw.