

HACETTEPE UNIVERSITY

DEPARTMENT OF COMPUTER ENGINEERING BBM104



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Subject : Dynamic Arrays, Structs, File I/O

Programming Language : C

1. Main Goal of the Assignment

The main goal of the assignment is to read the input given and apply it to specific functions to get the result in the C language. Thus having knowledge about how to use on Dynamic Arrays, Structs, File I / O. Aim is to gain practicality

2. What Do You Use

I created typedef struct. I introduced the inputs to the system for solving problem . Then I created a empty output file. I defined the required variables as pointers (char**arr, karakter* karakter_array). Then I started reading the files. I set the number of characters in the input(Char.txt). Then I split structure with malloc function. I fill in the variables of each character in the structure with the information of the characters in the input file. After reading the characters, I read the command file and created a char 2d array by assigning the numbers in the load map to the malloc function. I created functions in the rest of the commands and made the program progress.

3. Explain Your Data Structure

I used structure for store character informations . This structure contains character type, character name, character health, character experiment, character damage, character coordinates.

Character type is char array, character name is char array, character health is integer, character experiment is integer, character damage is integer ,coordinates for map(x,y) integer x and y .

I used 2d array to store characters or map. I created rows with a calloc function and then i used the malloc function in the for loop to create the columns

4. Explain your code

int kontrol():this function controls given coordinates(x,y) outside 2d array.if coordinates is inside of 2d array, function will controls adjacent squares. If adjacent squares is empty, return false. If adjacent squares isn't empty, control character type.if the two types of characters are equal to each other,return false. if the two types of characters are different, character will attack adjacent squares.

void azaltma():if returns true from **kontrol()** function,**azaltma()** will work and character will attack adjacent square. character in the adjacent square loses health. If Heroes attack and kill monsters ,heroes experiment in the structure an increase.

int saldirma():Characters can attack any adjacent square,this function sets the direction for the attack of the character. **saldirma()** function send necessary parameters to **kontrol()** function. if **kontrol()**function return true ,start **azaltma()** function.

int main(int argc,char* argv[]): Run the program .This function does read input files,merge 2 string,create write output file, allocate dynamic memory(malloc calloc free),fill structures elements, manage to command lines,compare 2 string, copy string ,filling array with '.',fill map with first letter of the character .if all heroes or monsters died ,this function finish the program

4. Give your detailed algorithm step by step

Firstly main function reads input file and then determine input number for output<input_number>.txt. Using malloc for char* output and merge 3 string and obtain output files name .output file created. Integer array_sayisi variable save lines number. Reads input(chars.txt) file lines with fscanf function for obtain lines number and main function will create structure. Using malloc function for divide by array_sayisi.

Rewind function reads the same file twice in the code in C. Again read same(chars.txt) file lines with fscanf. Fscanf reads lines, delete newline character, split lines and fills structures elements.

Ant then main function will read command line argümant.main function delete newline character and split line for manage to first Word .

if first Word equal SHOW,again split and obtain second word.if second Word equal map, function write map in output file.If second Word equal hero ,function write heroes status in output file.If second Word equal monster, function write monster status in output file

if first Word equal LOADMAP,function allocate dynamic memory,using calloc and build 2d char array the fill 2d array with '.'.

if first Word equal PUT,function fills characters x and y coordinates of the structure ant then place the initials of the characters in the map

if first Word equal ATTACK,function again use strtok and obtain the type of character to be attacked for second word.Second Word must attack different character type so determine same type character according to second Word. Send the required parameters to saldırma() function. saldırma() function manages to parameter and starts kontrol function.

If kontrol() function returns true ,saldırma ()function starts azaltma()function. If kontrol() function returns false ,starts another if statement. If all the characters of a species die, the karar(int variable) will increase and game will finish

if first Word equal MOVE ,function again use strtok and obtain hero name. And the again use strtok (twice) obtain new x and y coordinates. If coordinates out of map , If statement write <hero name >can't move. There is a Wall. for output file. If hero is dead, if statement write<hero name>can't move. Dead. for output file. If there are other characters in the new coordinates, if statement write<hero name> can't move. Place is occupied. for output file. The hero moves to new coordinates if there is no problem.