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#include <stdio.h>

#include <stdlib.h>

#include <string.h>

#define cons 15

char \*\* populate\_list(char \*\*, int \*);

void count\_courses(char \*\*, int, int \*, int \*);

void display\_frequency(int, int);

int main(){

int i, size;

char \*\*courseNames;

courseNames = populate\_list(courseNames, &size);

int freqCNG, freqEEE;

count\_courses(courseNames, size, &freqCNG, &freqEEE);

display\_frequency(freqCNG, freqEEE);

for(i=0;i<size;i++)//freeing 2-D array

free(courseNames[i]);

free(courseNames);

return 0;

}

char \*\* populate\_list(char \*\*courseNames, int \*size){

char \*\*courseNames2;

int num = 10; /\* since I dont know how many course will user input, I created limit of 10,

if user exceeds this limit, I will reallocate my array with 5 more limit.\*/

courseNames = (char\*\*)malloc(num\*sizeof(char\*)); //rows allocation

if (courseNames == NULL){

printf("Out of memory!");

exit(-1);

}

printf("Enter the list of courses:\n");

int i = 0, spaceController, j;

char inp[cons];

do{

gets(inp);

spaceController = 0;

for(j=0;j<strlen(inp);j++){ // if there is space it will be 1

if (inp[j] == 32){

spaceController=1;

break;

}

}

if(!spaceController && strcmp(inp,"Exit"))// if controller is 0 give error

printf("Wrong course name! Course name format is departmentcode coursecode\n");

else if(strncmp(inp,"CNG",3) && strncmp(inp,"EEE",3) && strcmp(inp,"Exit"))

printf("Wrong course name! Course name should start with EEE or CNG!\n");

else if(strcmp(inp,"Exit")){

if (i>=num){ // reallocation condition

num +=5;

courseNames2 = (char\*\*)realloc(courseNames,num\*sizeof(char\*));

free(courseNames);

courseNames = courseNames2; /\*This method worked fine, if any other more efficient way exists please feedback me \*/

if (courseNames == NULL){

printf("Out of memory for reallocation");

exit(-1);

}

}

courseNames[i] = (char \*)malloc(cons\*sizeof(char)); // columns allocation

if(courseNames == NULL){

printf("Out of memory!");

exit(-1);

}

strcpy(courseNames[i], inp);

i++; // for other allocations

}

}while(strcmp(inp,"Exit"));

\*size = i;

return courseNames;

}

void count\_courses(char \*\*courseNames, int size, int \*freqCNG, int \*freqEEE){

\*freqCNG = 0;

\*freqEEE = 0;

int i;

for(i=0;i<size;i++){

if(!strncmp(courseNames[i],"CNG",3))

(\*freqCNG)++;

else if(!strncmp(courseNames[i],"EEE",3))

(\*freqEEE)++;

}

}

void display\_frequency(int freqCNG, int freqEEE){

printf("\nNumber of courses per department:\n");

printf("CNG : %d\n",freqCNG);

printf("EEE : %d",freqEEE);

}