NIRMA UNIVERSITY

INSTITUTE OF TECHNOLOGY

Innovative Assignment Report

On

"LOGIC BUILDING GAME"

B. Tech CSE

(2CS101 Computer Programming)

Submitted by: -

Vansh Diyora	21bce060
Diksha Sharma	21bce058
Dipti Shah	21bce059

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OBJECTIVES:

This project titled “Logical building game” is a normal snake game with a twist in which the user is asked question to build up their logic. It basically gives a question to the player based on logical reasoning. If the player answers it correctly, the score increases but if the answer is wrong the score remains the same however the length of the snake increases.

DATA STRUCTURES USED

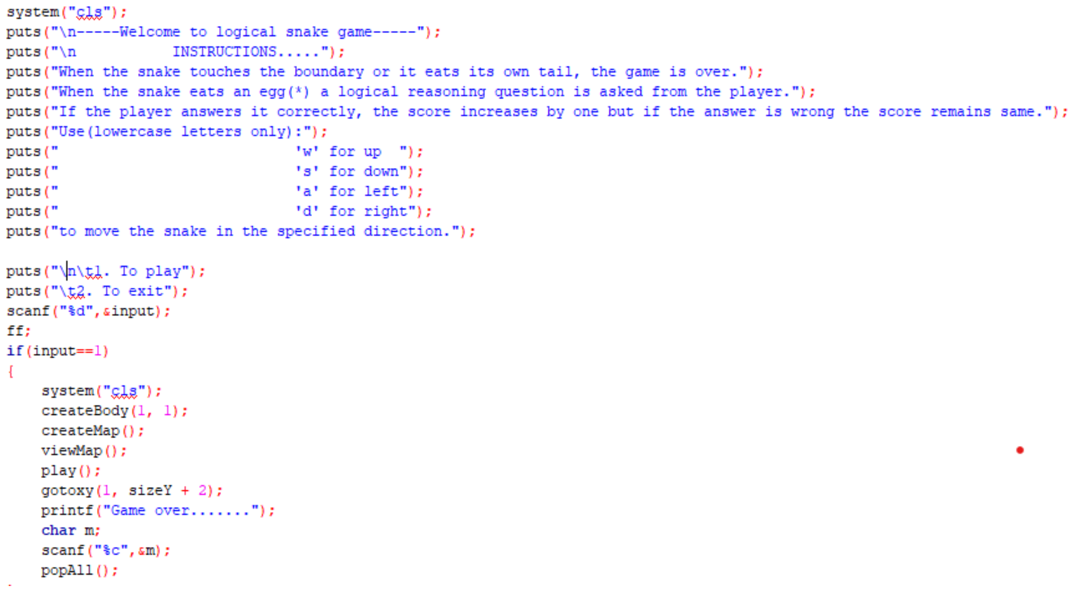
1) Linked list
2) Queue
3) Array

FUNCTIONS

Main Function:

The function prints out the basic instruction that the user has to follow while playing the game.

After the instructions are printed a menu driven is outputted for the user to choose whter he wants to play or exit the game.

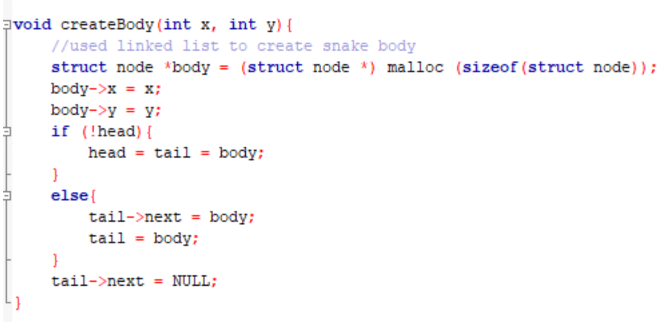


```
system("cls");
puts("\n-----Welcome to logical snake game-----");
puts("\n             INSTRUCTIONS.....");
puts("When the snake touches the boundary or it eats its own tail, the game is over.");
puts("When the snake eats an egg(*) a logical reasoning question is asked from the player.");
puts("If the player answers it correctly, the score increases by one but if the answer is wrong the score remains same.");
puts("Use(lowercase letters only):");
puts("                            'w' for up  ");
puts("                            's' for down");
puts("                            'a' for left");
puts("                            'd' for right");
puts("to move the snake in the specified direction.");

puts("\n\t1. To play");
puts("\t2. To exit");
scanf("%d",&input);
ff;
if(input==1)
{
    system("cls");
    createBody(1, 1);
    createMap();
    viewMap();
    play();
    gotoxy(1, sizeY + 2);
    printf("Game over.......");
    char m;
    scanf("%c",&m);
    popAll();
```

1)Create body:

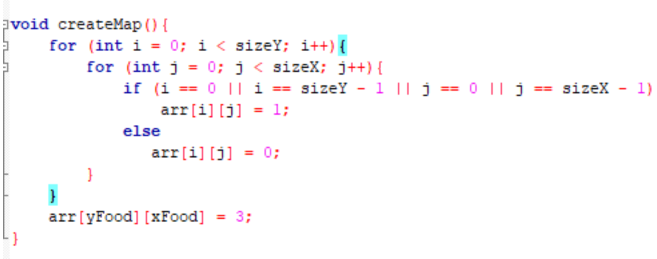
This function is used to create the body of the snake.



```
void createBody(int x, int y){
    //used linked list to create snake body
    struct node *body = (struct node *) malloc (sizeof(struct node));
    body->x = x;
    body->y = y;
    if (!head){
        head = tail = body;
    }
    else{
        tail->next = body;
        tail = body;
    }
    tail->next = NULL;
}
```

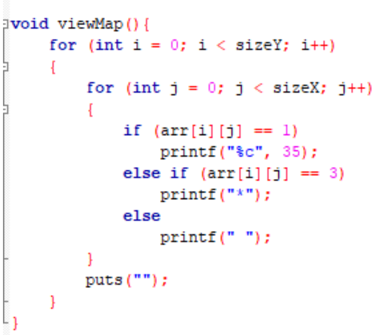
2)create map:

This function is used to create the blueprint of the game map.



```
void createMap(){
    for (int i = 0; i < sizeY; i++){
        for (int j = 0; j < sizeX; j++){
            if (i == 0 || i == sizeY - 1 || j == 0 || j == sizeX - 1)
                arr[i][j] = 1;
            else
               arr[i][j] = 0;
        }
    }
    arr[yFood][xFood] = 3;
}
```

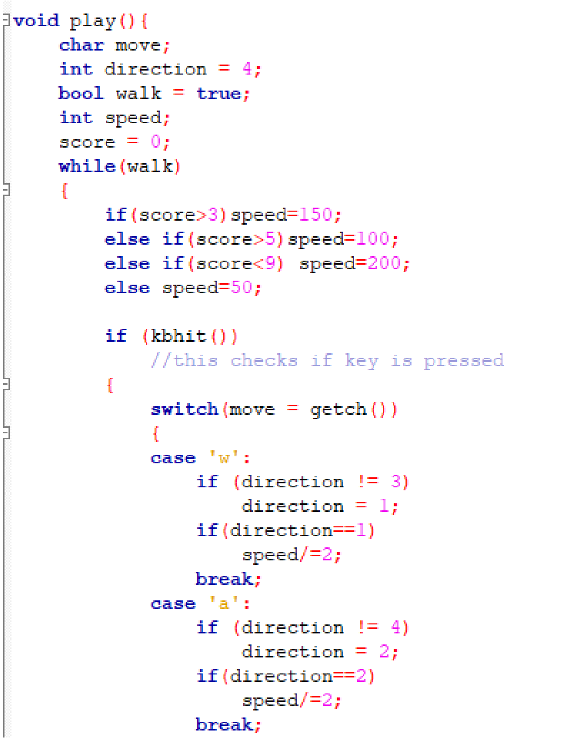
3)view map



```
void viewMap(){
    for (int i = 0; i < sizeY; i++)
    {
        for (int j = 0; j < sizeX; j++)
        {
            if (arr[i][j] == 1)
                printf("%c", 35);
            else if (arr[i][j] == 3)
                printf("*");
            else
                printf(" ");
        }
        puts("");
    }
}
```

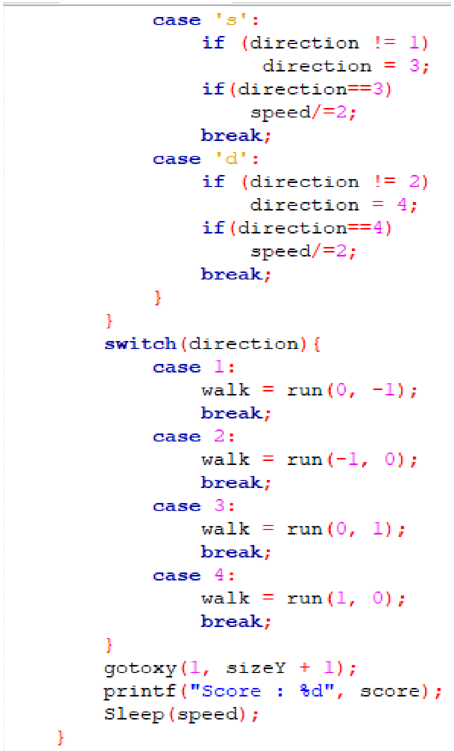
4)play:

Functions to play the game :



```
void play(){
    char move;
    int direction = 4;
    bool walk = true;
    int speed;
    score = 0;
    while(walk)
    {
        if(score>3)speed=150;
        else if(score>5)speed=100;
        else if(score<9) speed=200;
        else speed=50;

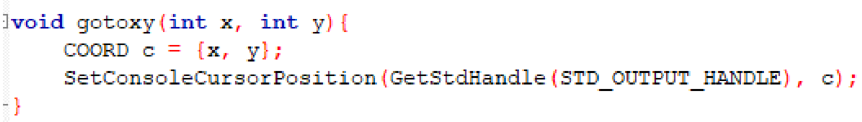
        if (kbhit())
            //this checks if key is pressed
        {
            switch(move = getch())
            {
            case 'w':
                if (direction != 3)
                    direction = 1;
                if(direction==1)
                    speed/=2;
                break;
            case 'a':
                if (direction != 4)
                    direction = 2;
                if(direction==2)
                    speed/=2;
                break;
```



```
            case 's':
                if (direction != 1)
                     direction = 3;
                if(direction==3)
                    speed/=2;
                break;
            case 'd':
                if (direction != 2)
                    direction = 4;
                if(direction==4)
                    speed/=2;
                break;
            }
        }
        switch(direction){
            case 1:
                walk = run(0, -1);
                break;
            case 2:
                walk = run(-1, 0);
                break;
            case 3:
                walk = run(0, 1);
                break;
            case 4:
                walk = run(1, 0);
                break;
        }
        gotoxy(1, sizeY + 1);
        printf("Score : %d", score);
        Sleep(speed);
    }
```

5)gotoxy:

This function points the cursor at a given point on the map.

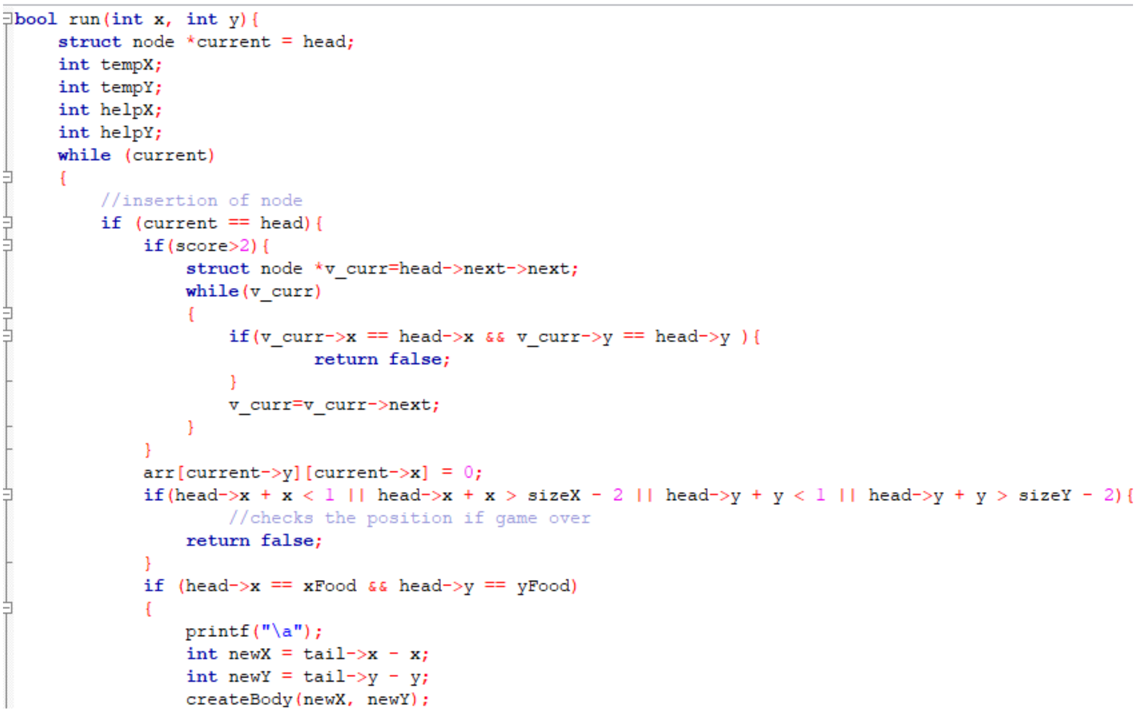


```
void gotoxy(int x, int y){
    COORD c = {x, y};
    SetConsoleCursorPosition(GetStdHandle(STD_OUTPUT_HANDLE), c);
}
```

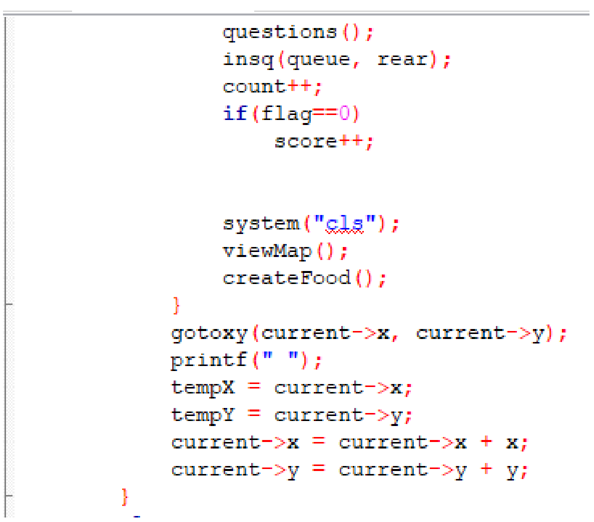
6) run

This function changes the direction of the snake. It also increases the length of the snake and checks for the conditions of game over.

It implements the use of linked list heavily.

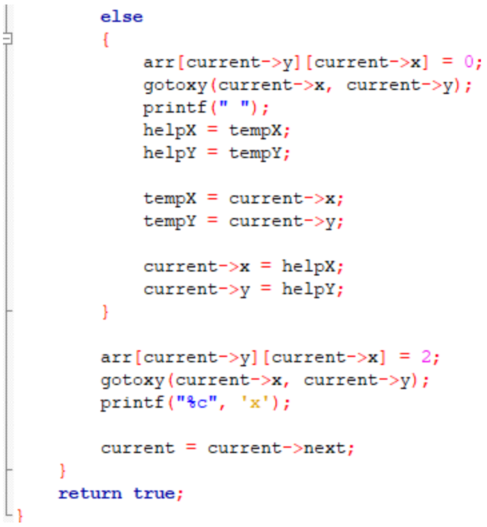


```
bool run(int x, int y){
    struct node *current = head;
    int tempX;
    int tempY;
    int helpX;
    int helpY;
    while (current)
    {
        //insertion of node
        if (current == head){
            if(score>2){
                struct node *v_curr=head->next->next;
                while(v_curr)
                {
                    if(v_curr->x == head->x && v_curr->y == head->y ){
                            return false;
                    }
                    v_curr=v_curr->next;
                }
            }
            arr[current->y][current->x] = 0;
            if(head->x + x < 1 || head->x + x > sizeX - 2 || head->y + y < 1 || head->y + y > sizeY - 2){
                    //checks the position if game over
                return false;
            }
            if (head->x == xFood && head->y == yFood)
            {
                printf("\a");
                int newX = tail->x - x;
                int newY = tail->y - y;
                createBody(newX, newY);
```



```
                questions();
                insq(queue, rear);
                count++;
                if(flag==0)
                    score++;


                system("cls");
                viewMap();
                createFood();
            }
            gotoxy(current->x, current->y);
            printf(" ");
            tempX = current->x;
            tempY = current->y;
            current->x = current->x + x;
            current->y = current->y + y;
        }
```



```
        else
        {
            arr[current->y][current->x] = 0;
            gotoxy(current->x, current->y);
            printf(" ");
            helpX = tempX;
            helpY = tempY;

            tempX = current->x;
            tempY = current->y;

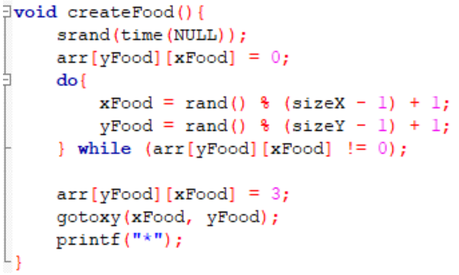
            current->x = helpX;
            current->y = helpY;
        }

        arr[current->y][current->x] = 2;
        gotoxy(current->x, current->y);
        printf("%c", 'x');

        current = current->next;
    }
    return true;
}
```

7)Createfood

This function creates the food in the game.

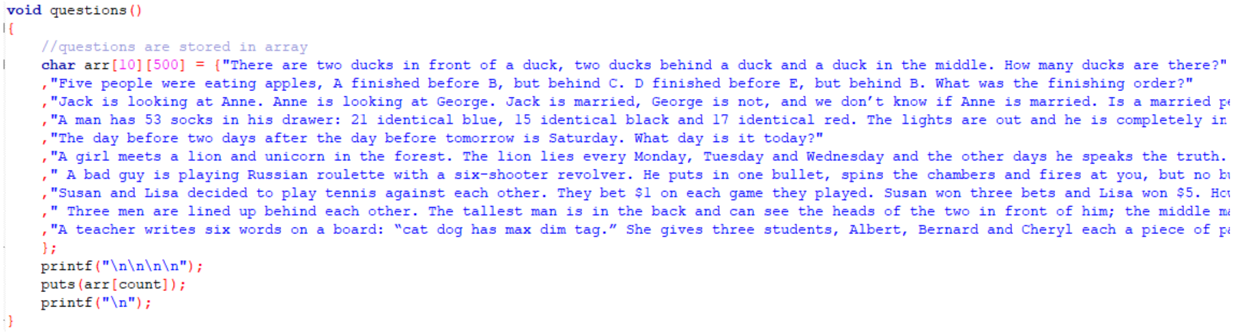


```
void createFood(){
    srand(time(NULL));
    arr[yFood][xFood] = 0;
    do{
        xFood = rand() % (sizeX - 1) + 1;
        yFood = rand() % (sizeY - 1) + 1;
    } while (arr[yFood][xFood] != 0);

    arr[yFood][xFood] = 3;
    gotoxy(xFood, yFood);
    printf("*");
}
```

8)questions

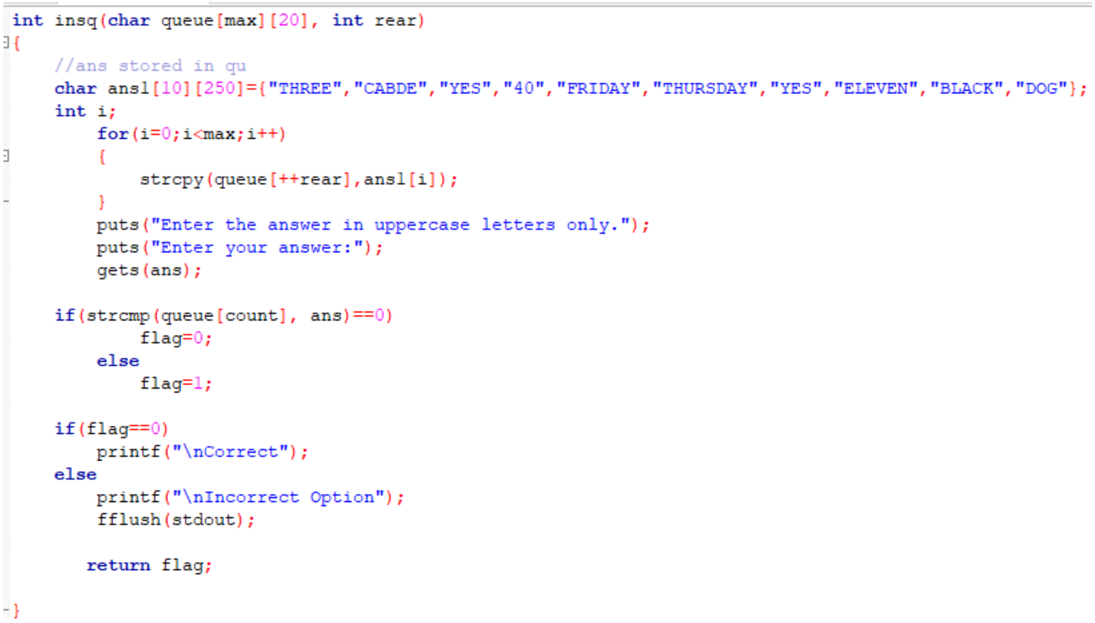
This function contains all the logical questions stored in an array.



```
void questions()
{
    //questions are stored in array
    char arr[10][500] = {"There are two ducks in front of a duck, two ducks behind a duck and a duck in the middle. How many ducks are there?"
    ,"Five people were eating apples, A finished before B, but behind C. D finished before E, but behind B. What was the finishing order?"
    ,"Jack is looking at Anne. Anne is looking at George. Jack is married, George is not, and we don’t know if Anne is married. Is a married pe
    ,"A man has 53 socks in his drawer: 21 identical blue, 15 identical black and 17 identical red. The lights are out and he is completely in
    ,"The day before two days after the day before tomorrow is Saturday. What day is it today?"
    ,"A girl meets a lion and unicorn in the forest. The lion lies every Monday, Tuesday and Wednesday and the other days he speaks the truth.
    ," A bad guy is playing Russian roulette with a six-shooter revolver. He puts in one bullet, spins the chambers and fires at you, but no bu
    ,"Susan and Lisa decided to play tennis against each other. They bet $1 on each game they played. Susan won three bets and Lisa won $5. Ho
    ," Three men are lined up behind each other. The tallest man is in the back and can see the heads of the two in front of him; the middle ma
    ,"A teacher writes six words on a board: “cat dog has max dim tag.” She gives three students, Albert, Bernard and Cheryl each a piece of pa
    };
    printf("\n\n\n\n");
    puts(arr[count]);
    printf("\n");
}
```

9)insq

This function takes an answer from the user and checks whether it is correct or not. It then displays the appropriate message whether the answer is correct or not.



```
int insq(char queue[max][20], int rear)
{
    //ans stored in qu
    char ans1[10][250]={"THREE","CABDE","YES","40","FRIDAY","THURSDAY","YES","ELEVEN","BLACK","DOG"};
    int i;
        for(i=0;i<max;i++)
        {
            strcpy(queue[++rear],ans1[i]);
        }
        puts("Enter the answer in uppercase letters only.");
        puts("Enter your answer:");
        gets(ans);

    if(strcmp(queue[count], ans)==0)
            flag=0;
        else
            flag=1;

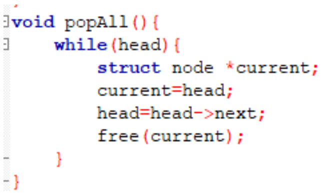
    if(flag==0)
        printf("\nCorrect");
    else
        printf("\nIncorrect Option");
        fflush(stdout);

       return flag;

}
```

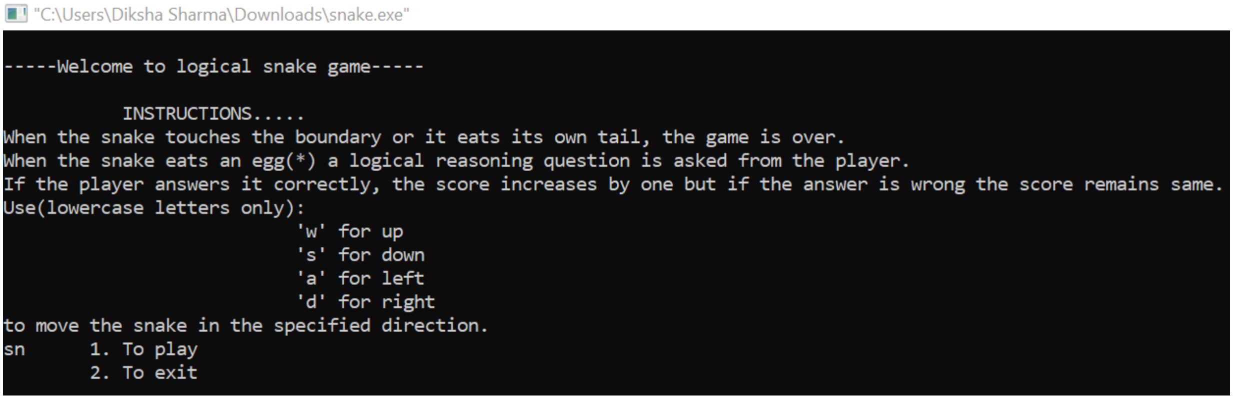
10) popAll

It deletes all the elements of the linked list



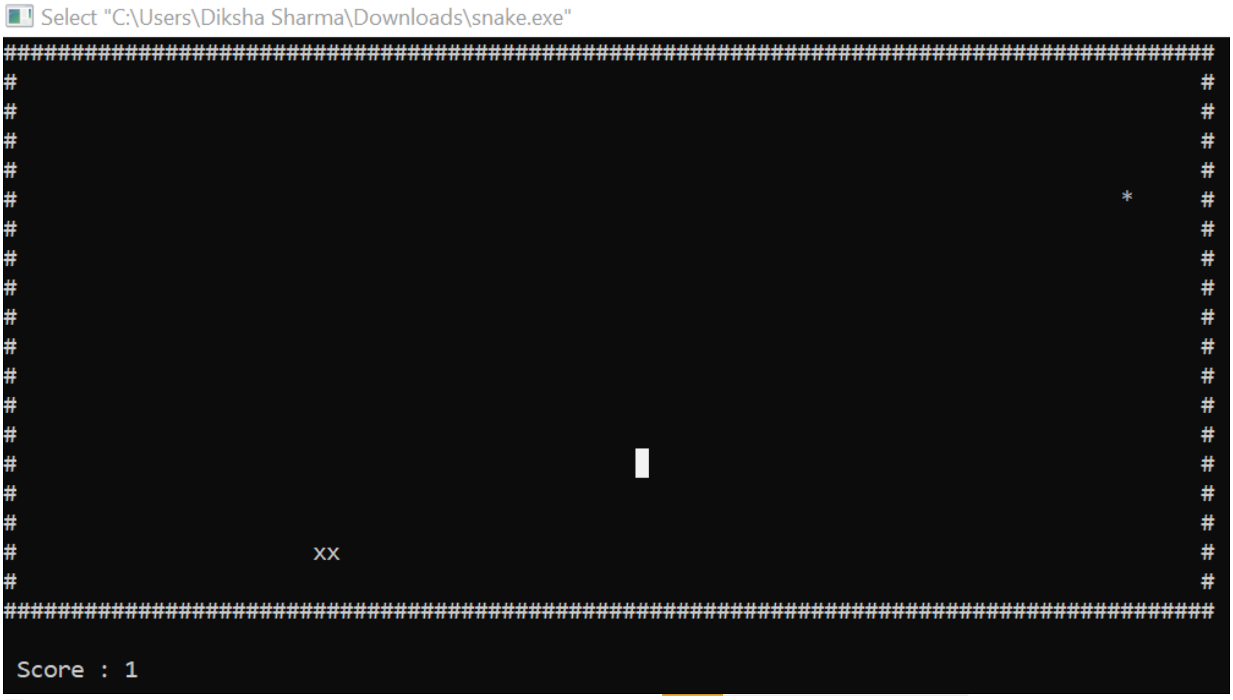
```
void popAll(){
    while(head){
        struct node *current;
        current=head;
        head=head->next;
        free(current);
    }
}
```

Output:


"C:\Users\Diksha Sharma\Downloads\snake.exe"

```
-----Welcome to logical snake game-----

           INSTRUCTIONS.....
When the snake touches the boundary or it eats its own tail, the game is over.
When the snake eats an egg(*) a logical reasoning question is asked from the player.
If the player answers it correctly, the score increases by one but if the answer is wrong the score remains same.
Use(lowercase letters only):
                           'w' for up
                           's' for down
                           'a' for left
                           'd' for right
to move the snake in the specified direction.
sn      1. To play
        2. To exit
```


Select "C:\Users\Diksha Sharma\Downloads\snake.exe"

```
##########################################################################################
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#                     XX                                                                 #
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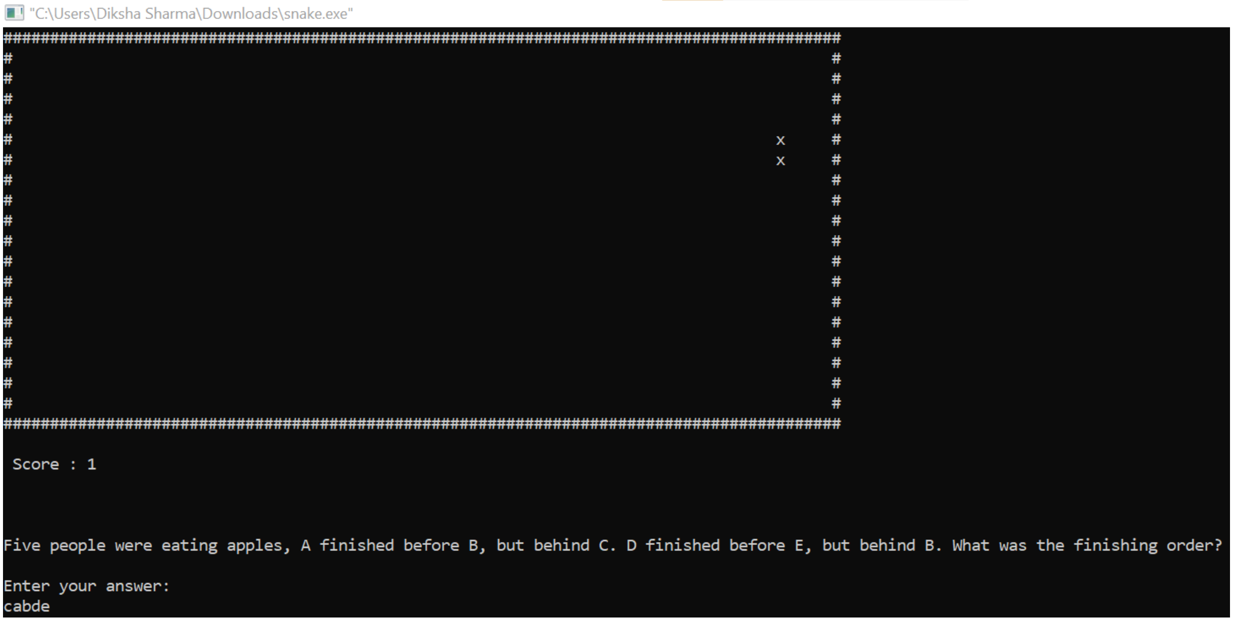
##########################################################################################

 Score : 1
```


"C:\Users\Diksha Sharma\Downloads\snake.exe"

```
##########################################################################################
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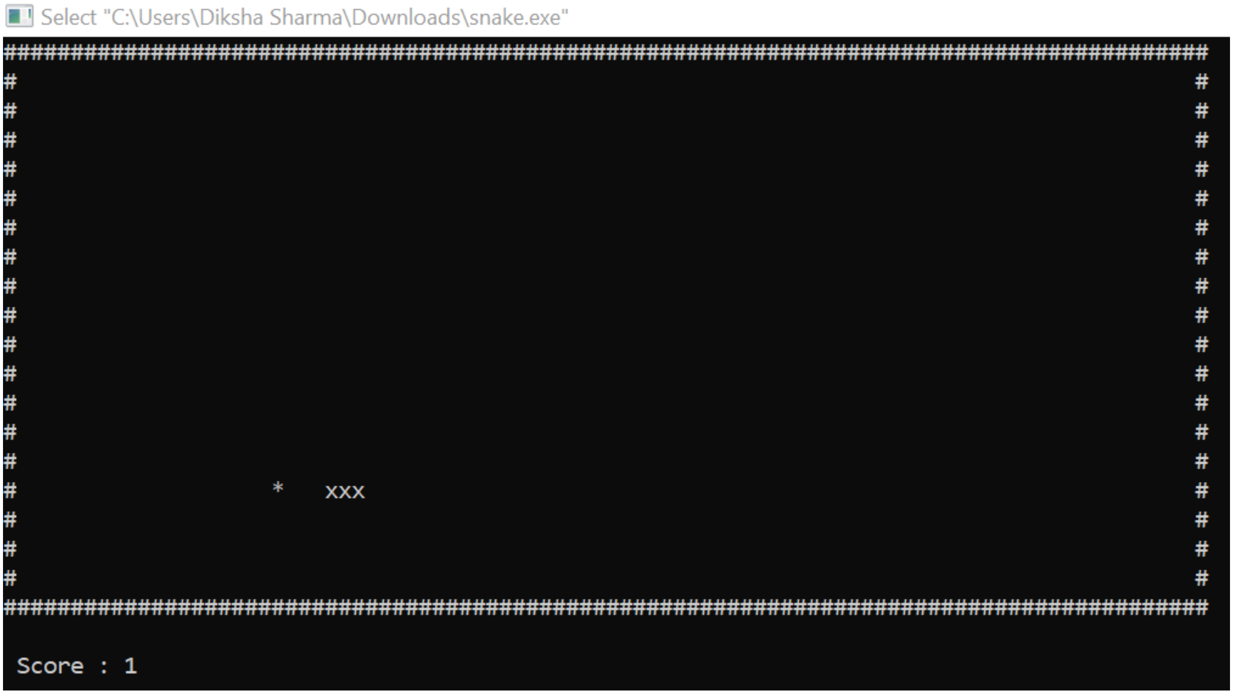
##########################################################################################

 Score : 1


Five people were eating apples, A finished before B, but behind C. D finished before E, but behind B. What was the finishing order?

Enter your answer:
cabde
```



Select "C:\Users\Diksha Sharma\Downloads\snake.exe"

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#                   *   xxx                                                              #
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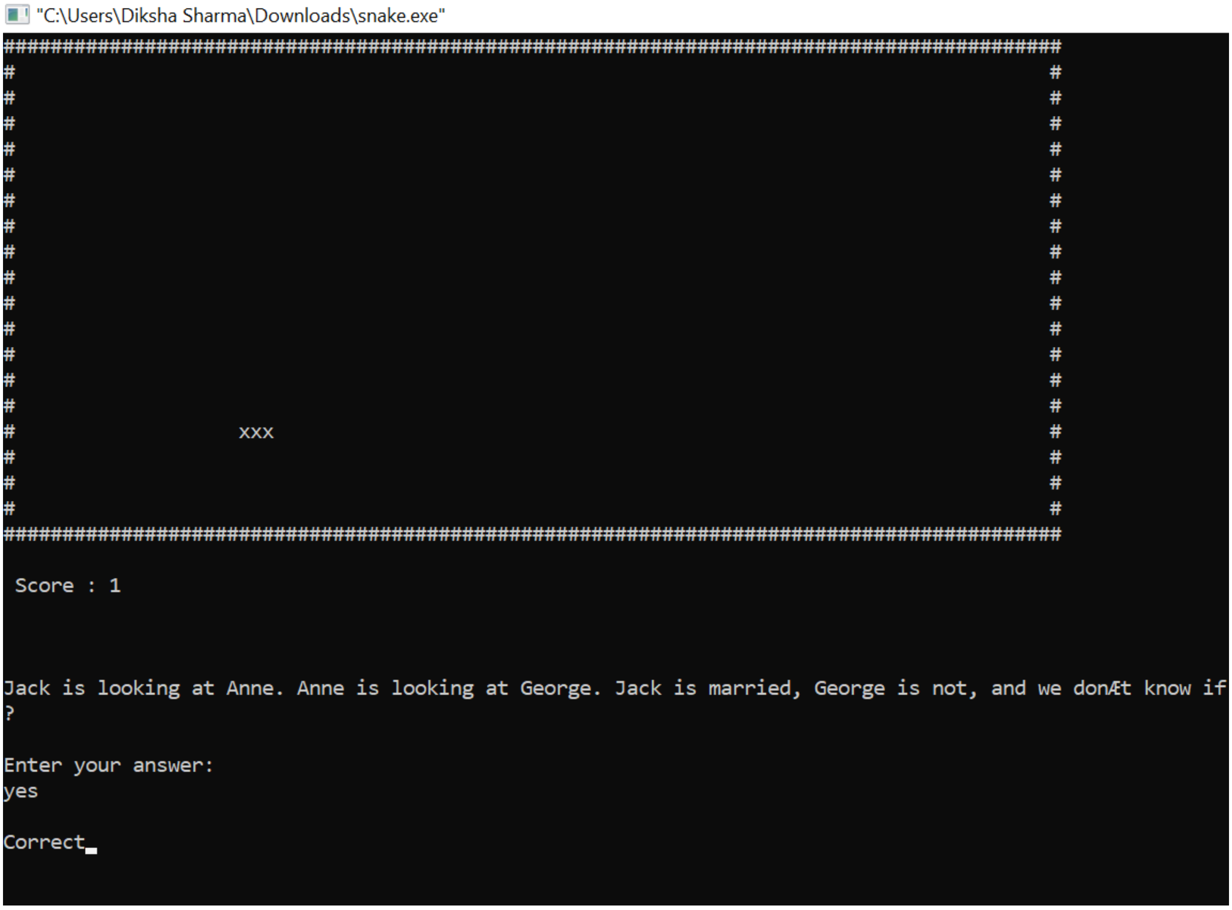
##########################################################################################

 Score : 1
```



"C:\Users\Diksha Sharma\Downloads\snake.exe"

```
##########################################################################################
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#                   xxx                                                                  #
#                                                                                        #
#                                                                                        #
#                                                                                        #
##########################################################################################

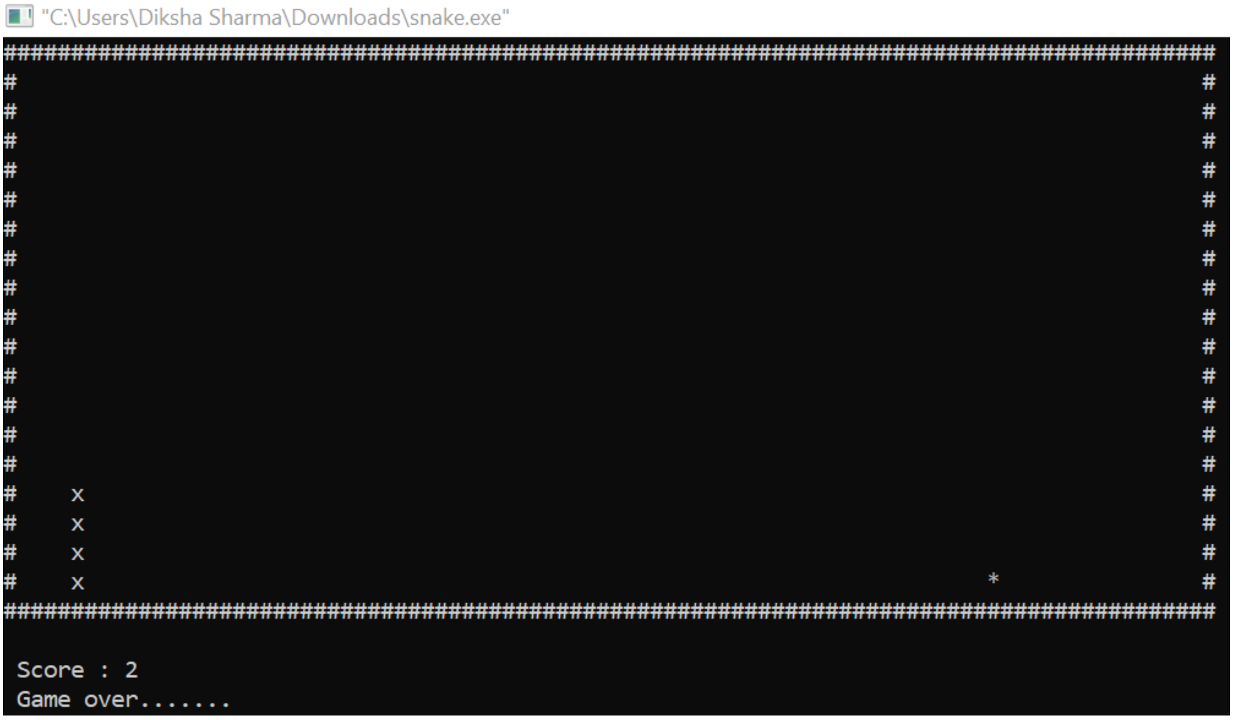
 Score : 1



Jack is looking at Anne. Anne is looking at George. Jack is married, George is not, and we donÆt know if
?

Enter your answer:
yes

Correct
```



"C:\Users\Diksha Sharma\Downloads\snake.exe"

```
###################################################################################
#                                                                                 #
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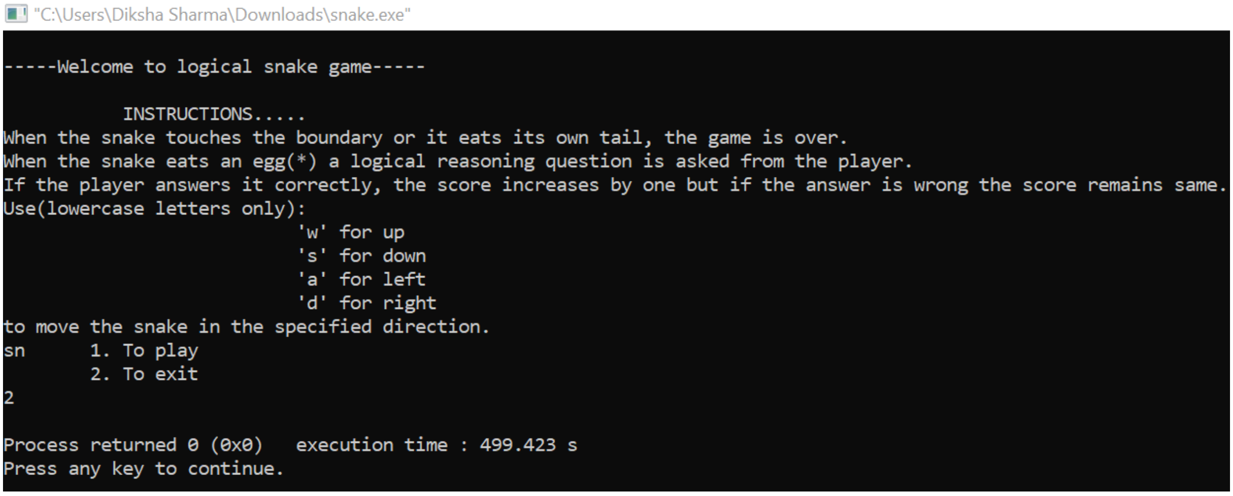
#                                                                                 #
#    x                                                                            #
#    x                                                                            #
#    x                                                                            #
#    x                                                              *             #
###################################################################################

 Score : 2
 Game over.......
```



"C:\Users\Diksha Sharma\Downloads\snake.exe"

```
-----Welcome to logical snake game-----

           INSTRUCTIONS.....
When the snake touches the boundary or it eats its own tail, the game is over.
When the snake eats an egg(*) a logical reasoning question is asked from the player.
If the player answers it correctly, the score increases by one but if the answer is wrong the score remains same.
Use(lowercase letters only):
                           'w' for up
                           's' for down
                           'a' for left
                           'd' for right
to move the snake in the specified direction.
sn      1. To play
        2. To exit
2

Process returned 0 (0x0)   execution time : 499.423 s
Press any key to continue.
```