



Quiz Game

A C LANGUAGE PROJECT

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Project Statement

This project aims to create a simulation of the quintessential MCQ-type quiz game.

PROBLEM DEFINITION:

There are 10 questions to be answered by entering desired option. 4 cherries are awarded for correct answers while 1 cherry is deducted for every wrong answer.

HARDWARE AND SOFTWARE USED:

Device used: HP Probook 360

Project Developed on:

1. Linux Command Line, Ubuntu 18.04.1 LTS

GAME VARIABLES:

Name	Scope	Visibility	Datatype
name	struct player	default	char[100]
score	struct player	default	int
high_score	struct player	default	int
P	global	global	struct player
temp	global	global	struct player
fp	update_record()	local	FILE
f	update_record()	local	FILE
c	update_record()	local	char
q_buf	game	local	char[500]
op1	game	local	char[100]
op1	game	local	char[100]
ans_user	game	local	char
ans	game	local	char
j	game	local	int
ch	game	local	int
q	game	local	FILE
a	game	local	FILE
buffer	main	local	char[100]
flag	main	local	int
choice	main	local	int
old_players	main	local	FILE
new_player	main	local	FILE

METHODS EMPLOYED:

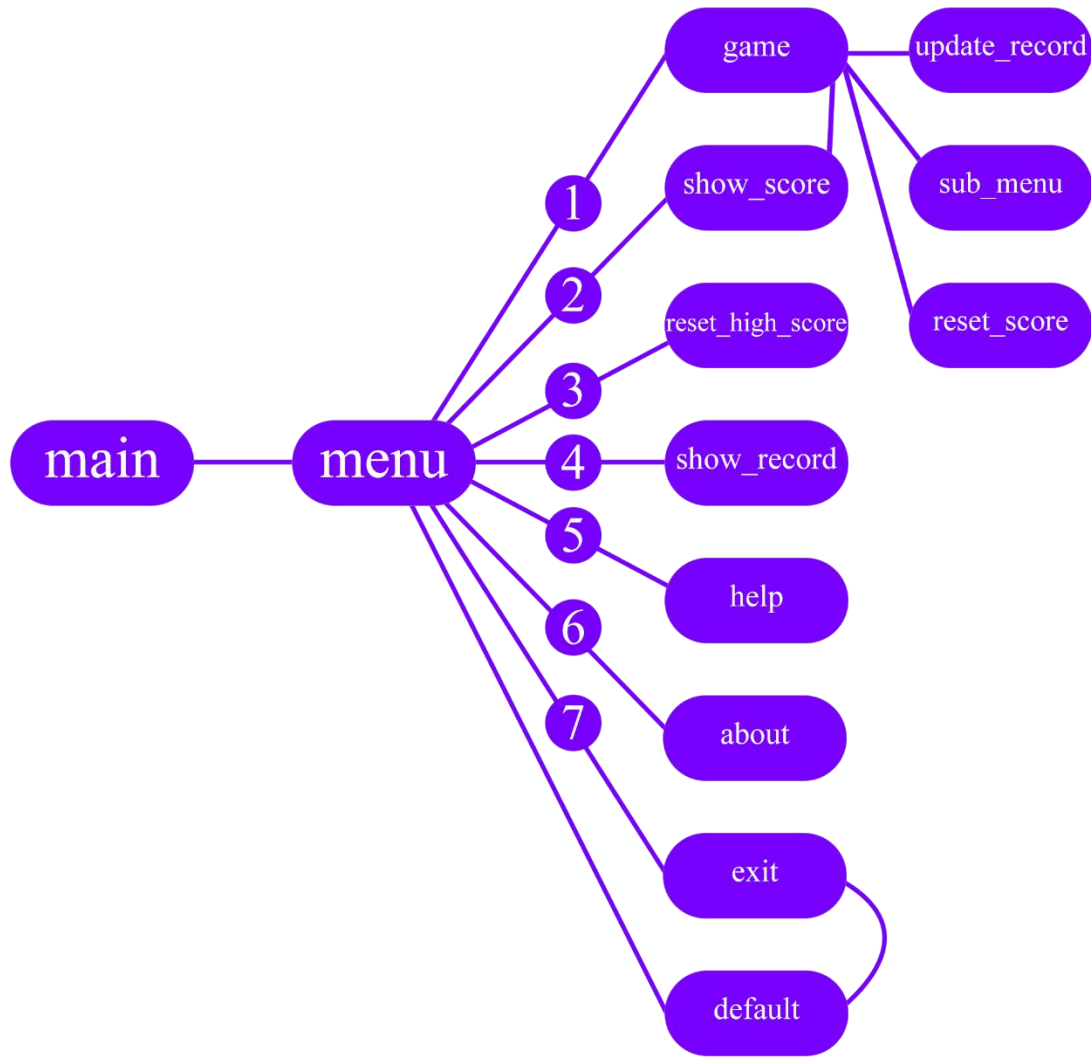
- void menu () – displays the main menu
- void sub_menu () – displays the sub-menu, and the choices of subjects
- void show_record () – displays current player name and high score
- void show_score () – displays current player's last game score and high score
- void update_record () – updated current player's details into the log
- void reset_score () – resets the score for current game
- void reset_high_score () – resets current player's high score
- void help () – displays game instructions
- void about () – contains game and game developer information
- void game () – heart of the program, the actual quiz game
- int main () – container for the driver code

Name	Scope	Return Type	Arguments
menu	global	void	-
sub_menu	global	void	-
show_record	global	void	-
show_score	global	void	-
update_record	global	void	-
reset_score	global	void	-
reset_high_score	global	void	-
help	global	void	-
about	global	void	-
game	global	void	-
main	global	void	-

OTHER DATA STRUCTURES:

- struct player – contains name, score and high score of players inside a structure variable
- players.txt – file to store the log of all players and their high scores
- questions_m.txt – Mathematics questions file
- questions_h.txt – History questions file
- questions_g.txt – Geography questions file
- questions_s.txt – Science questions file
- answers_m.txt – Mathematics answers file
- answers_h.txt – History answers file
- answers_g.txt – Geography answers file
- answers_s.txt – Science answers file
- temp.txt – temporary file used to update the log file

PROCESS FOLLOWED:



A Main Menu is employed with the following choices:

1. New Game
2. Show Score
3. Reset High Score
4. Show Record
5. Help
6. About Game
7. Exit Game

A do while loop also runs with a check which ends and exits the program if it encounters a non-integer input.

MODULES AND FEATURES:

1. **New Game:** This module contains the main logic of the game. We elaborate on this in the next sub-section
2. **Show Score:** this module shows the score of the current player in the last game along with their total high score
3. **Reset High Score:** This module helps the current player to erase their highest score and set it to 0
4. **Show Record:** This module prints to the console the name and high score of the current player
5. **Help:** This module highlights the basic steps needed for a user to play this game
6. **About Game:** A simple print statement which returns a small introduction of the game and includes the name of the developer.
7. **Exit Game:** a simple exit (o) statement in order to terminate the program.
8. All players along with their highest scores are saved in a log file.
9. Any invalid input at the time of the choice of menu options results in immediate game termination

GAME () MODULE:

1. We begin by using the reset_score () function to reset the score of the current player to 0 before the game begins
2. We then display the sub-menu and prompt the user to select a subject based on this sub-menu
3. Once the user makes a choice, we open the read file streams for the appropriate questions and answers files as per the subject selected
4. Next, we enter a loop for the 10 questions
5. At a time, we read 3 lines from the questions file (questions, options line 1 and options line 2) and 1 character from the answers file
6. We display the three lines of questions to the console and take one character as input from the user for the answer
7. Then we compare the user-entered answer with the answer read from the file
8. If they match, we update the score by 4 cherries, else we deduct 1 cherry and display appropriate messages
9. Once the 10 questions are displayed and verified, we display the total score and display appropriate messages
10. We add the current score of the user with the previous high score and update the player information in the record
11. After this, we return to the main menu

Source Code

```
//preprocessors imported

#include <stdio.h>

#include <stdlib.h>

#include <string.h>

//all details pertaining to the current player will be handled through this structure
struct player
{
    char name[100];
    int score;
    int high_score;

} P, temp;

//information about this version of the game
void about()
{
    printf("\nABOUT THE GAME\n\nThis is a merit-based quiz. 4 cherries are
    awarded for every correct answer and 1 cherry is deducted for every wrong answer. This
    version of the game has been developed by Proteeti Kushari.\n");
}

//help regarding playing the game
void help()
{
    printf("\nHELP\n\nEnter choice as per menu, and then enter only the option
    letter for each question.\nThere is only one correct option.\nYour end score will be
    displayed at the end of each game, and the highest score will be saved for you whenever
    you play the game.\n");
}

//sets current game score of player to zero, this is invoked before every game
```

```

void reset_score()
{
    P.score=0;
}

//resets the highest score of the current player to 0, invoked only via the menu
void reset_high_score ()
{
    P.high_score=0;
}

//shows the name and score details of current player
void show_record()
{
    printf("\nHi %s!\nYour highest score is: %d cherries", P.name, P.high_score);
}

//shows score in the last game played in current session and the all-time high score
void show_score()
{
    printf("\nScore: %d cherries\nHigh Score: %d cherries", P.score, P.high_score);
}

//presents the menu and details the options to be chosen by player
void menu()
{
    printf("\n\n\nMENU\n\n1. New Game\n2. View Scores\n3. Reset High Score\n4.
View Profile \n5. Help\n6. About the game\n7. Exit\n\nEnter choice: ");
}

void sub_menu ()
{

```

```

        printf("\n\nSUBJECT MENU\n\n1. Maths\n2. History\n3. Geography\n4.
Science\n5. Main Menu\n\nEnter choice: ");
    }

//updates current high score to the log file

void update_record()
{
    FILE *fp, *f;

    char c;

    //first we copy the contents of log file to a temp file

    fp = fopen("players.txt", "r");
    f = fopen ("temp.txt", "w");

    c=fgetc(fp);
    while (c!=EOF)
    {
        fputc(c, f);
        c=fgetc(fp);
    }

    fclose(fp);
    fclose(f);

    //we copy back the contents from temp file to the log file until we reach the
current player

    //for the current player we simply insert the latest details from the players
structure

    fp = fopen("players.txt", "w");
    f = fopen ("temp.txt", "r");
    while (!feof(f))
    {
        fscanf(f, "%s", temp.name);

```



```

        fscanf(f, "%d\n", &temp.high_score);
        if (strcmp(P.name, temp.name)==0)
            temp.high_score=P.high_score;
        fputs(temp.name, fp);
            fputs(" \o", fp);
            fprintf(fp, "%d", temp.high_score);
            fputs("\n\o", fp);
    }
    fclose(fp);
    fclose (f);
}

//heart of the program
//controls the quiz game
void game()
{
    reset_score();

    char q_buf[500], ans_user, ans, hold, op1[100], op2[100];

    int i=1, j, ch;

    FILE *q, *a;

    //we present a sub menu with the choice of subject and then load the
    appropriate files as per user choice

    while (ch!=5)
    {
        sub_menu();

        scanf("%d", &ch);

        switch(ch)
        {

```

case 1:

```
q=fopen("questions_m.txt", "r");
a=fopen("answers_m.txt", "r");
break;
```

case 2:

```
q=fopen("questions_h.txt", "r");
a=fopen("answers_h.txt", "r");
break;
```

case 3:

```
q=fopen("questions_g.txt", "r");
a=fopen("answers_g.txt", "r");
break;
```

case 4:

```
q=fopen("questions_s.txt", "r");
a=fopen("answers_s.txt", "r");
break;
```

case 5:

```
return;
```

default:

```
printf("\nInvalid choice.");
return;
```

```
}
```

//we read 3 lines from questions file containing the question and the 2 lines of options

//then we read one character from the answers file and match with the user-entered character

//we update the score likewise

```
for (j=0; j<10; j++)
```

```

{
    fgets(q_buf, 500, q);
    fgets(op1, 100, q);
    fgets(op2, 100, q);
    printf("\n%s%s%s\nAns: ", q_buf, op1, op2);
    scanf(" %c", &ans_user);
    ans=fgetc(a);
    if (ans==ans_user)
    {

        printf("\nCorrect answer!\n+4!\n");
        P.score+=4;
    }
    else
    {
        printf("\nWrong answer!\nCorrect Ans: %c\n-1!\n", ans);
        P.score-=1;
    }
    printf("*****");
}

fclose(a);
fclose(q);

//we print the current score and high score after updating the high score if
necessary

printf("\nCongratulations!\n");
P.high_score+=P.score;
show_score();

```

```

        //we update the details of this player in the log file
        update_record();
    }
}

void main ()
{
    char buffer[100];
    int flag=0, choice=-1;

    //we take the name of the current player as input and reset the current
    score for them

    printf("\nHello! Welcome to Quiz Game!\nEnter player name: ");
    scanf("%[^\\n]%*c", P.name);

    reset_score(P);

    //we check if this player is an old player or a new one

    //we return the last high score of the player if he/she is an old one

    //otherwise we initialize the high score to zero and enter the records of the
    new player into the log

    FILE *old_players=fopen("players.txt", "r");
    while(!feof(old_players))
    {
        fscanf(old_players, "%s", buffer);
        if (strcmp(P.name, buffer)==0)
        {
            flag=1;
            fscanf(old_players, "%d", &P.high_score);
            printf("\nWelcome back %s!\nYour highest score is: %d", P.name,
P.high_score);
            break;
        }
    }
}

```

```

        }
    }
    fclose(old_players);
    if (flag==0)
    {
        FILE *new_player=fopen("players.txt", "a");
        printf("\nWelcome %s!\nStart a new game today!", P.name);
        reset_high_score();
        fputs(P.name, new_player);
        fputs(" \o", new_player);
        fprintf(new_player, "%d", P.high_score);
        fputs("\n\o", new_player);
        fclose(new_player);
    }

    //we present the choice of options to the player and keep iterating until the
    user escapes
    while (choice!=7)
    {
        menu();
        scanf("%d", &choice);
        switch(choice)
        {
            case 1:
                game();
                break;
            case 2:
                show_score();

```

```

        break;
    case 3:
        reset_high_score();
        break;
    case 4:
        show_record();
        break;
    case 5:
        help();
        break;
    case 6:
        about();
        break;
    case 7:
        exit(o);
    default:
        printf("\nInvalid choice entered.\n");
    }
}
}

```

Glimpses into The Game

1. Main Menu:

```
Hello! Welcome to Quiz Game!
Enter player name: B

Welcome back B!
Your highest score is: 35

MENU
1. New Game
2. View Scores
3. Reset High Score
4. View Profile
5. Help
6. About the game
7. Exit

Enter choice: 1
```

2. Subject Menu and a question:

```
SUBJECT MENU
1. Maths
2. History
3. Geography
4. Science
5. Main Menu

Enter choice: 3

1. Which is the highest peak in the world?
a. K2 b. Everest
c. Fuji d. Kilimanjaro

Ans: b

Correct answer!
+4 cherries!
*****
```

3. Return to Main Menu:

```
SUBJECT MENU
1. Maths
2. History
3. Geography
4. Science
5. Main Menu

Enter choice: 5

MENU
1. New Game
2. View Scores
3. Reset High Score
4. View Profile
5. Help
6. About the game
7. Exit

Enter choice: 2
```

4. View Scores:

```
MENU
1. New Game
2. View Scores
3. Reset High Score
4. View Profile
5. Help
6. About the game
7. Exit

Enter choice: 2

Score: 40 cherries
High Score: 75 cherries
```

5. View Profile

```
MENU
1. New Game
2. View Scores
3. Reset High Score
4. View Profile
5. Help
6. About the game
7. Exit

Enter choice: 4

Hi B!
Your highest score is: 75 cherries
```

6. Help:

```
MENU
1. New Game
2. View Scores
3. Reset High Score
4. View Profile
5. Help
6. About the game
7. Exit

Enter choice: 5

HELP

Enter choice as per menu, and then enter only the option letter for each question.
there is only 1 correct option.
Your end score will be displayed at the end of each game, and the highest score will be saved for you whenever you play the game.
```

7. About the Game:

```
MENU
1. New Game
2. View Scores
3. Reset High Score
4. View Profile
5. Help
6. About the game
7. Exit

Enter choice: 6

ABOUT THE GAME

This is a merit-based quiz. 4 cherries are awarded for every correct answer and 1 cherry is deducted for every wrong answer. This version of the game has been developed by Proteeti Kushari.
```


8. Exit:

```
MENU
1. New Game
2. View Scores
3. Reset High Score
4. View Profile
5. Help
6. About the game
7. Exit

Enter choice: 7
kiit@kiit-VirtualBox:~/quiz/quiz2$
```

9. players.txt (log file):

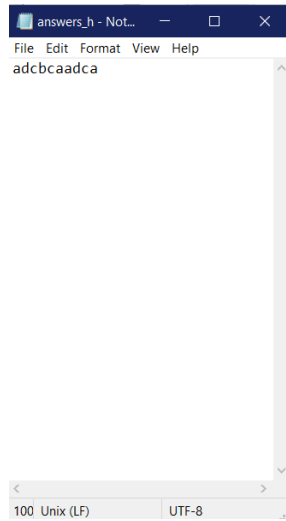
```
players - Notep...
File Edit Format View Help
A 115
B 75

100 Unix (LF) UTF-8
```

10. questions_h.txt (History Questions):

```
questions_h - Notepad
File Edit Format View Help
1. What was the British trading institute in India called?
a. East India Company b. West Indian Company
c. Queen Victoria Company d. King George Company
2. Which is the longest epic in the world?
a. Iliad b. Merchant of Venice
c. Shah Jo Risalo d. Mahabharata
3. Which part of ancient India was named after 7 rivers?
a. Kalinga b. Dravida
c. Sindhu d. Himalaya
4. Who was the last emperor of Indian Emperor before its Independence?
a. Bahadur Shah Zafar b. Queen Elizabeth II
c. King George VI d. Rajaraja Chola
5. Which dynasty rose to power after the decline of the Mauryan dynasty?
a. Chola b. Maratha
c. Gupta d. Pal
6. When did World War II end?
a. 1945 b. 1947
c. 1914 d. 1949
7. To which country did the Catholic Monarchs belong to?
a. Spain b. USA
c. Japan d. France
8. Which is the first civilization of India?
a. Vedic b. Bronze
c. Chera d. Indus Valley
9. Who was the last King of the Nanda dynasty?
a. Mahapadma-nanda b. Uggasena-nanda
c. Dhana-nanda d. Rashtrapala-nanda
10. Who was the first Queen to rule without a King?
a. Queen Mary I of Tudor b. Queen Elizabeth II of Windsor
c. Queen Anne Boleyn d. Queen Cleopatra VII
```

11. answers_h.txt (History Answers):



Also, the other conditions – all subject quizzes, wrong answers and invalid user inputs were tested and found to be working.

Critique

1. Only a fixed amount and order of questions can be displayed for the user, randomization has not been implemented.
2. Till now this version of the game includes only one set of questions for each subject. This limitation can easily be overcome while adding new questions or subjects.