Quiz Me!

Midterm Project

SECTION # 6

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Problem

Our task was to write a program consisting of three quizzes, with one true or false, a multiple choice and fill in the blank question each. The beginning of the program brings the user to a menu where they pick a number and get a random quiz. Then they take the quiz until they get a perfect score. Once they get a perfect score, the average score across all attempts is calculated and they are given the option to take another quiz or quit.

Analysis

Writing this program is going to require several functions. The main menu calls the quizzes, each in their own separate function, and additional functions would be needed to calculate total averages and scores after each quiz. It would also need appropriate while and for loops to continue until the user wanted to exit.

Each quiz function would need to keep track of correct answers, and loop as long as it took for the user to get a perfect score. It would also need to tell the user whether they got each question correct or incorrect.

The function to calculate the final score would need a variable to keep track of every attempt on every quiz. It would also not be called until the user decided to exit the program.

Design

Main Menu: The main() function was used as a main menu for the user. It first prompted them to pick a random number, that number was then seeded and used to pick a random quiz. After the first random quiz was completed, the main function enters an infinite loop until the user decides to exit. Within this loop, the user chooses to take another quiz manually, or exit and receive a total score.

Quiz functions: Each quiz was written in its own function and with the same pattern. Each function printed the given question, scanned for input, and was followed by an if /else statement to determine if the answer was correct. Each correct answer added 5 points to the attempt score. Once the user got a perfect score, the quiz loop was broken and the program returned to the main menu.

Total Average function: The totalAverage function was called after the user decided to exit the program. After every quiz attempt, the value of points they got from the attempt was stored in an array. Once the user decided to exit, totalAverage iterated through this array, turned each value into a percent by dividing by 15 and multiplying by 100, and calculated the average score by adding each percent and dividing by the number of attempts.

Testing

Testing for this program was done incrementally. First we tested the part of the main function that generated the random seed based on user input. It was possible to get all three quizzes using the numbers within the given range. Testing the quizzes first required making sure each correct answer was formatted correctly. Then we tested that the correct points were given for each correct answer. We also made sure that a perfect score would end the loop, and another score would repeat the quiz.We also had to test the part of the main function that came after the initial random quiz. We tested the new indefinite loop that allowed the user to choose which quiz to do after they completed the first one, testing that it could be broken or called the right quiz functions based on user input. The last component that needed to be tested was the totalAverage function. This function was called after the user decided to exit the program and its purpose was to display the user's final average score across all quiz attempts. Testing this function was done by taking quizzes and intentionally getting certain results, then comparing the output with what the actual percentage should be.

Comments

This was my first project I decided to work on with a partner and it went smoother than I thought!

Screen Shots: Down Below ↓

```c
/*-------------------------------------------------------------------------
-                SE 185: Midterm Project                                -
-
1- Sam Russett - Role: Quiz Creator and debugger - Participation: 50%
(Created some quiz questions, totalAverage() function, random seed generation, and various components of the quizzes.)
2- Kenneth Schueman - Role: Quiz Creator and debugger - Participation: 50%
(Created some quiz questions and functions along with some GUI.)
-------------------------------------------------------------------------*/

#include <stdio.h>
#include <stdlib.h>
#include <time.h>
#include <stdbool.h>
#include <string.h>

void quiz1();
void quiz2();
void quiz3();
void totalAdverage();
int totalAttempts[30];
int attemptNumber = 0; //initialize attempt number outside of loop

int main() //Random Selection and main menu
{
    int userNum;
    int userChoice;

    printf("\nWelcome! You have three quizzes to choose from!\n");
    printf("Enter your lucky number 1-9 (inclusive) to get a random seeded quiz.\n");
    printf("Type anything else to exit: ");

    scanf("%d", &userNum);

    if ((userNum>=1)&&(userNum<=9)){
        srand(userNum);
        int randomNum = (rand()%100);

        if (randomNum%3 == 1){
            printf("\nYou got Quiz 1!");
            quiz1();
        }

        else if (randomNum%3 == 2){
            printf("\nYou got Quiz 2!");
            quiz2();
        }
        else{
            printf("\nYou got Quiz 3!");
            quiz3();
        }


    }
    else{
        printf("\n:(\n");
    }

    printf("\n\nYou have completed your first quiz, now you get to choose the next one.");

    while (7 != 5){

        printf("\nPleases select the number corrisponding to a quiz you haven't already taken");//Main Menu
        printf("\nIf you have completed all quizzes enter option 4");
        printf("\n1) Quiz01\n2) Quiz02\n3) Quiz03\n4) Calculate my results and exit\n\nAnswer: ");
        scanf("%d", &userChoice);

        if (userChoice == 1){
            quiz1();

        }
        else if (userChoice == 2){
            quiz2();
        }
        else if (userChoice == 3){
            quiz3();
        }
        else if (userChoice == 4){
            totalAdverage();
            printf("\nThank you for playing!");
                break;
        }


    }

    return 0;
}

void quiz1(){
    int quizScore = 0;
    int cont; //exit input
    double quizPercent;
    int quiz1answer1;
    int quiz1answer2;
    char quiz01question3[50];

    printf("\n\n\nQuiz 1\nThere are 3 questions, each worth 5 points.");
    printf("\nYou can take this quiz until you get a perfect score.");

    while (quizScore != 15){

        attemptNumber += 1; //+1 attempt at the top of each loop
        printf("\n\nThis is attempt #%d", attemptNumber);
        quizScore = 0;
```

```c
109            if (quiz1answer1 == 2){ //Question 1 check
110                quizScore += 5;
111                printf("\nCorrect!\n\nScore for this attempt: %d / 15", quizScore);
112            }
113            else{
114                printf("\nIncorrect\n\nScore for this attempt so far: %d / 15", quizScore);
115            }
116
117        //Question 2
118        printf("\n\n\nQuestion 2: Multiple Choice (answer with corresponding number)\n\n");
119        printf("How many total values can be held in this array?");
120        printf("\n\nint NUM_ARRAY[5][7];");
121        printf("\n1) 5\n2) 7\n3) 35\n4) 12");
122        printf("\n\nAnswer: ");
123        scanf("%d", &quiz1answer2);
124
125        if (quiz1answer2 == 3){ //Question 2 Check
126          quizScore += 5;
127           printf("\nCorrect!\n\nScore for this attempt: %d / 15", quizScore);
128        }
129        else{
130          printf("\nIncorrect\n\nScore for this attempt so far: %d / 15", quizScore);
131        }
132
133
134        printf("\n\nQuestion03 fill in the blank"); //Third question
135        printf("What library must you include to use the abs() function?");
136        printf("\nWrite your answer in this fill in the blank format, #include <_____>");
137        printf("Your answer here: ");
138        scanf("%s", quiz01question3);
139
140        if(strcmp(quiz01question3, "math.h") == 0){
141          quizScore += 5;
142           printf("\nCorrect!\n\nScore for this attempt: %d / 15", quizScore);
143        }
144        else{
145          printf("\nIncorrect\n\nScore for this attempt so far: %d / 15", quizScore);
146        }
147
148            totalAttempts[attemptNumber-1] = quizScore; //End of quiz score
149            if (quizScore == 15){
150                for (int i = 0; i < attemptNumber; ++i) {
151                quizPercent += (totalAttempts[i] / (15.0 * attemptNumber));
152                }
153                quizPercent *= 100;
154                printf("\n\nYou got a perfect score! In total you got a %.2f%% in %d attempts", quizPercent, attemptNumber);
155            }
156
157            else{
158                printf("\n\nYou did not get a perfect score yet, would you like to take the quiz again?\n(0 to go to main menu,
159                scanf("%d", &cont);
160            if (cont == 0){
161              break;
162                }
163            }
164        }
165 }
166
167 void quiz2(){
168    int quizScore = 0;
169    int quiz2answer1, quiz2answer2;
170    char quiz2answer3[50];
171    int cont; //exit input
172    double quizPercent;
173
174     printf("\n\n\nQuiz 2:\nThere are 3 questions, each worth 5 points.");
175     printf("\nYou can take this quiz until you get a perfect score.");
176
177    int attemptNumber = 0;
178
179    while (quizScore != 15){
180            attemptNumber += 1; //+1 attempt at the top of each loop
181            printf("\n\nThis is attempt #%d", attemptNumber);
182            quizScore = 0;
183
184        int quiz2answer1; //Quiz02 Question 1
185            printf("\n\nQuestion 1: True or False\n");
186            printf("Is a valid variable declaration: float myNum = 10.5?;");
187            printf("\n\nAnswer (1 for true and 2 for false): ");
188            scanf("%d", &quiz2answer1);
189            if (quiz2answer1 == 1){ //Question 1 check
190                quizScore += 5;
191                 printf("\nCorrect!\n\nScore for this attempt: %d / 15", quizScore);
192        }
193            else{
194                printf("\nIncorrect\n\nScore for this attempt so far: %d / 15", quizScore);
195        }
196
197        printf("\n\nQuestion02: Multiple choice"); //Second question
198        printf("\nAnswer with corresponding number:\n What is the binary equivalent to 164? \n1) 10111001\n2) 11011001\n3) 0
199        printf("\nNumber _ is correct: ");
200        scanf("%d", &quiz2answer2);
201
202        if (quiz2answer2 == 4) { //Second question check
203            quizScore += 5;
204            printf("\nCorrect!\n\nScore for this attempt: %d / 15", quizScore);
205        }
206        else{
207            printf("\nIncorrect\n\nScore for this attempt so far: %d / 15", quizScore);
208        }
209
210        printf("\n\nQuestion03 fill in the blank");
211        printf("\n(omit whitespaces!)"); //Third question
```

```c
211                printf("\n(omit whitespaces!)"); //Third question
212                printf("\nComplete the program to print "Hello World!"\nx = 3\ny = 5");
213                printf("\n\nIf ( x __ y ) {\n    printf("Hello World!");\n}\nelse{}\nOperator: ");
214                scanf("%s", quiz2answer3);
215
216                if ((strcmp(quiz2answer3, "!=") == 0)){ //Third question check
217                        quizScore += 5;
218                     printf("\nCorrect!\n\nScore for this attempt: %d / 15", quizScore);
219                }
220                else{
221                    printf("\nIncorrect\n\nScore for this attempt so far: %d / 15", quizScore);
222                }
223
224          totalAttempts[attemptNumber-1] = quizScore; //End of quiz score
225            if (quizScore == 15){
226                for (int i = 0; i < attemptNumber; ++i) {
227                    quizPercent += (totalAttempts[i] / (15.0 * attemptNumber));
228                }
229                quizPercent *= 100;
230                printf("\n\nYou got a perfect score! In total you got a %.2f%% in %d attempts", quizPercent, attemptNumber);
231            }
232
233
234            else{
235                printf("\n\nYou did not get a perfect score yet, would you like to take the quiz again?\n(0 to go to main menu,
236          scanf("%d", &cont);
237            if (cont == 0){
238              break;
239            }
240                quizScore = 0;
241            }
242    }
243 }
244
245 void quiz3(){
246    int quizScore = 0;
247    int attemptNumber = 0;
248    char quiz03question3[50];
249    int quiz03question2;
250    int cont; //exit input
251    double quizPercent;
252
253      while (quizScore != 15){
254          attemptNumber += 1; //+1 attempt at the top of each loop
255          printf("\n\nThis is attempt #%d", attemptNumber);
256          quizScore = 0;
257
258        int quiz3answer1; //Question 1
259          printf("\n\nQuestion 1: True or False\nPrinting string3 will result in the output \"Hello World!\"?");
260          printf("\n\nchar string1[10] = 'Hello';");
261          printf("\nchar string2[10] = 'World'");
262          printf("\nchar string3[20] = string1 + string2 + '!';");
263          printf("\n\nAnswer (1 for true or 2 for false): ");
264          scanf("%d", &quiz3answer1);
265          if (quiz3answer1 == 2){
266              quizScore += 5;
267            printf("\nCorrect!\n\nScore for this attempt: %d / 15", quizScore);
268          }
269          else{
270              printf("\nIncorrect\n\nScore for this attempt so far: %d / 15", quizScore);
271          }
272
273          printf("\n\nQuestion02: Multiple Choice"); //Second question
274          printf("\nPlease select the correct number:\n What is the correct way to calculate magnatude? \n1) magnitude = (x *
275          printf("\nNumber __ is correct: ");
276          scanf("%d", &quiz03question2);
277
278          if (quiz03question2 == 2) { //Question check
279              quizScore += 5;
280              printf("\nCorrect!\n\nScore for this attempt: %d / 15", quizScore);
281          }
282          else{
283              printf("\nIncorrect\n\nScore for this attempt so far: %d / 15", quizScore);
284          }
285
286          printf("\n\nQuestion03 fill in the blank");
287          printf("\n\nPlease fill in the blank \n(omit whitespaces!)"); //Third question
288          printf("\nWrite a malloc function call to allocate an array for 15 double variables.");
289          printf("\nchar* string = NULL;\nstring = (char*)malloc(_____);: ");
290          scanf("%s", quiz03question3);
291
292
293          if ((strcmp(quiz03question3, "10*sizeof(char)") == 0) || (strcmp(quiz03question3,"sizeof(char)*10") == 0)){ //Questi
294                  quizScore += 5;
295            printf("\nCorrect!\n\nScore for this attempt: %d / 15", quizScore);
296          }
297          else{
298              printf("\nIncorrect\n\nScore for this attempt so far: %d / 15", quizScore);
299          }
300
301          totalAttempts[attemptNumber-1] = quizScore; //End of quiz score
302            if (quizScore == 15){
303                for (int i = 0; i < attemptNumber; ++i) {
304                    quizPercent += (totalAttempts[i] / (15.0 * attemptNumber));
305                }
306                quizPercent *= 100;
307                printf("\n\nYou got a perfect score! In total you got a %.2f%% in %d attempts", quizPercent, attemptNumber);
308            }
309
310            else{
311                printf("\n\nYou did not get a perfect score yet, would you like to take the quiz again?\n(0 to go to main menu,
312                scanf("%d", &cont);
313            if (cont == 0){
```

```c
void totalAdverage(){
    double avgPercent;
    for (int i = 0; i <= attemptNumber; ++i){
    //totalAttempts[i] = totalAttempts[i] / 15.0;
    //printf("\n%d", totalAttempts[i]);
    avgPercent = totalAttempts[i] + avgPercent;
    }
    for (int i = 0; i <= attemptNumber; ++i){
        if (totalAttempts[i] == 0) {
            attemptNumber += 1;
        }
    }
    attemptNumber /= 10;
    printf("\n\nTotal points scored = %.2f", avgPercent);
    printf("\nTotal number of attempts = %d", attemptNumber);
    avgPercent = (avgPercent / (attemptNumber * 15.0)* 100);
    printf("\nYour average score across all quiz attempts is: %.2f%%", avgPercent);

}

double quizAdverage(double score){
    score /= 15;
    score *= 100;
    return (score);
}
```

```
kenns@LAPTOP-L53JNR5E /cygdrive/C/Users/kenns/OneDrive/Desktop/Desktop/SE185/Midterm
$ ./proj

Welcome! You have three quizzes to choose from!
Enter your lucky number 1-9 (inclusive) to get a random seeded quiz.
Type anything else to exit: 5

You got Quiz 1!


Quiz 1
There are 3 questions, each worth 5 points.
You can take this quiz until you get a perfect score.

This is attempt #1


Question 1: True or False

Is a valid scanf function for an integer: scanf?
("lf", &myInt);

Answer (1 for true and 2 for false): 1

Incorrect

Score for this attempt so far: 0 / 15


Question 2: Multiple Choice (answer with corresponding number)

How many total values can be held in this array?

int NUM_ARRAY[5][7];
1) 5
2) 7
3) 35
4) 12

Answer: 1

Incorrect

Score for this attempt so far: 0 / 15

Question03 fill in the blankWhat library must you include to use the abs() function?
Write your answer in this fill in the blank format, #include <_____>Your answer here: math.h

Correct!

Score for this attempt: 5 / 15

You did not get a perfect score yet, would you like to take the quiz again?
(0 to go to main menu, 1 to take quiz again): 1


This is attempt #2


Question 1: True or False

Is a valid scanf function for an integer: scanf?
("lf", &myInt);

Answer (1 for true and 2 for false): 2

Correct!

Score for this attempt: 5 / 15


Question 2: Multiple Choice (answer with corresponding number)

How many total values can be held in this array?

int NUM_ARRAY[5][7];
1) 5
2) 7
3) 35
4) 12

Answer: 3

Correct!

Score for this attempt: 10 / 15

Question03 fill in the blankWhat library must you include to use the abs() function?
Write your answer in this fill in the blank format, #include <_____>Your answer here: math.h

Correct!

Score for this attempt: 15 / 15

You got a perfect score! In total you got a 66.67% in 2 attempts

You have completed your first quiz, now you get to choose the next one.
Pleases select the number corrisponding to a quiz you haven't already taken
If you have completed all quizzes enter option 4
1) Quiz01
2) Quiz02
3) Quiz03
4) Calculate my results and exit

Answer: |
```

```
You have completed your first quiz, now you get to choose the next one.
Pleases select the number corrisponding to a quiz you haven't already taken
If you have completed all quizzes enter option 4
1) Quiz01
2) Quiz02
3) Quiz03
4) Calculate my results and exit

Choice: 3


This is attempt #1

Question 1: True or False
Printing string3 will result in the output "Hello World!"?

char string1[10] = 'Hello';
char string2[10] = 'World'
char string3[20] = string1 + string2 + '!';

Answer (1 for true or 2 for false): 2

Correct!

Score for this attempt: 5 / 15

Question02: Multiple Choice
Please select the correct number:
 What is the correct way to calculate magnatude?
1) magnitude = (x * y) + (y * z) + (z * x)
2) magnitude = (x * x) + (y * y) + (z * z)
3) magnitude = (pow(x,2) * pow(y,2) * pow(z,2))
4) magnitude = (x * x) * (y * y) * (z * z)
Number __ is correct: 2

Correct!

Score for this attempt: 10 / 15

Question03 fill in the blank

Please fill in the blank
(omit whitespaces!)
Write a malloc function call to allocate an array for 15 double variables.
char* string = NULL;
string = (char*)malloc(_____);: 10*sizeof(char)

Correct!

Score for this attempt: 15 / 15

You got a perfect score! In total you got a 6766.67% in 1 attempts
Pleases select the number corrisponding to a quiz you haven't already taken
If you have completed all quizzes enter option 4
1) Quiz01
2) Quiz02
3) Quiz03
4) Calculate my results and exit

Choice: 4


Total points scored = 30.00
Total number of attempts = 3
Your average score across all quiz attempts is: 66.67%
Thank you for playing!
```