Trivia Game

Nichole Medero
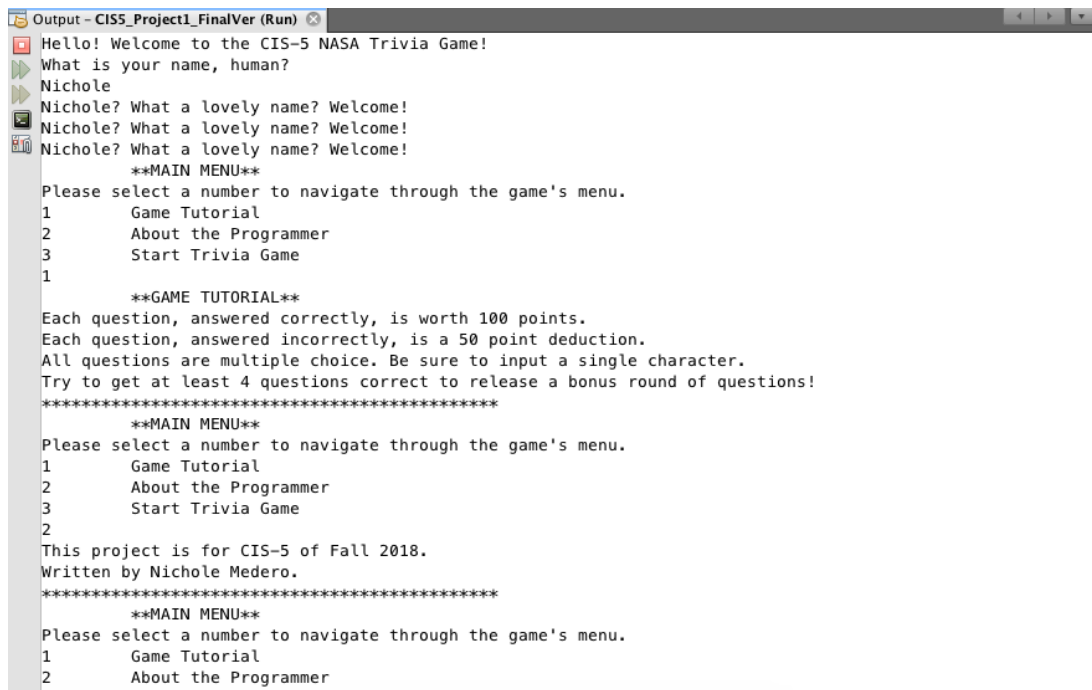CIS – 5
Program Logic with C++
Fall 2018
47948

I.   Introduction

A Trivia Game is a way to test one's knowledge amount one topic or various topics. They are incredibly customizable in terms of questions, point calculation, etc. For this game, I decided to incorporate National Aeronautics and Space Administration-related trivia questions. Each correct question resulted in an addition of 100 points. Each incorrect question resulted in a 50 point deduction. The score would be output after each question while also showing the user if their answer was correct or incorrect. The correct or incorrect variable is then incorrected depending on their answer. If the bonus round is not initiated, the user immediately sees the game solution read in from a file.

In order to initiate the bonus round, the user must have a score of at least 400 points, or have answered 4 questions right. The bonus round of 5 questions in then initiated. The same mathematical equations are applied to the bonus questions. Once the bonus round is completed, the user is then shown all the answers from the regular questions and the bonus questions. However, the score and percentage calculations are different depending on the number of questions answered. In order to account for this difference, the number of incorrect questions and correct questions are added for the correct percentage calculation.

The user then sees their score, the total correct questions, and the total correct questions percentage. The user's name and final score is also output into a separate file.

II.   Program Screenshot

```
Output – CIS5_Project1_FinalVer (Run)
Hello! Welcome to the CIS-5 NASA Trivia Game!
What is your name, human?
Nichole
Nichole? What a lovely name? Welcome!
Nichole? What a lovely name? Welcome!
Nichole? What a lovely name? Welcome!
        **MAIN MENU**
Please select a number to navigate through the game's menu.
1       Game Tutorial
2       About the Programmer
3       Start Trivia Game
1
        **GAME TUTORIAL**
Each question, answered correctly, is worth 100 points.
Each question, answered incorrectly, is a 50 point deduction.
All questions are multiple choice. Be sure to input a single character.
Try to get at least 4 questions correct to release a bonus round of questions!
*********************************************
        **MAIN MENU**
Please select a number to navigate through the game's menu.
1       Game Tutorial
2       About the Programmer
3       Start Trivia Game
2
This project is for CIS-5 of Fall 2018.
Written by Nichole Medero.
*********************************************
        **MAIN MENU**
Please select a number to navigate through the game's menu.
1       Game Tutorial
2       About the Programmer
```

```
*************************************************
What is the name of the largest volcano in the solar system?
a.        Mount St. Helens
b.        Olympus Mons
c.        Krakatoa
d.        Kotopaxi
b
Correct answer!
Your score is now 200!
*************************************************
Who was the first American woman in space?
a.        Sally Ride
b.        Nichole Medero
c.        nichole medero
d.        NiChOlE mEdErO
c
Incorrect answer!
Your score is now 150.
*************************************************
What is the smallest planet in our solar system?
a.        Earth
b.        Mars
c.        Mercury
d.        Neptune
a
Incorrect answer!
Your score is now 100.
*************************************************
What is the longest time a human has been sent to space?
a.        3 weeks
```

```
Woo! Pusheen the Cat is happy that you have completed the game, Nichole!
Your final score: 200
You answered 3 questions out of 5!
Or 60% of the questions.
```
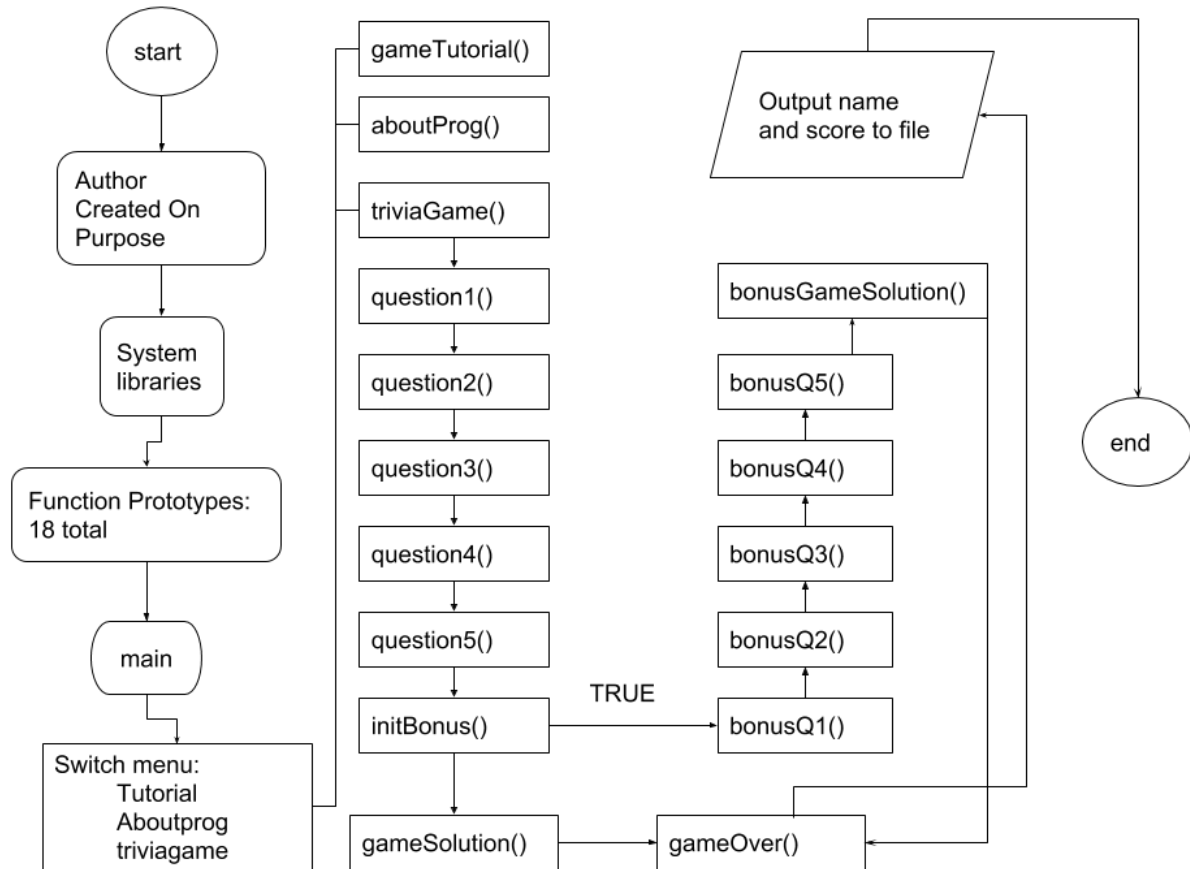
III.   Check List

Chapter	Section	Topic	Where Line #"s
2	2	cout	64, 65, 70, 88-92…
	3	libraries	22, 23, 24
	4	variables/literals	59-62, 68, 87 …
	5	Identifiers	62
	6	Integers	59-61
	7	Characters	151, 152
	8	Strings	62
	9	Floats No Doubles	589
	10	Bools	476
	11	Sizeof *****	
	12	Variables 7 characters or less	
	13	Scope ***** No Global Variables	
	14	Arithmetic operators	
	15	Comments 20%+	
	16	Named Constants	N/A
	17	Programming Style ***** Emulate	
3	1	cin	66, 93…
	2	Math Expression	163, 165…
	3	Mixing data types ****	
	4	Overflow/Underflow ****	
	5	Type Casting	602
	6	Multiple assignment *****	All functions
	7	Formatting output	
	8	Strings	
	9	Math Library	

	10	Hand tracing ******	
4	1	Relational Operators	
	2	if	161
	4	If-else	161
	5	Nesting	461
	6	If-else-if	
	7	Flags *****	
	8	Logical operators	
	11	Validating user input	70
	13	Conditional Operator	
	14	Switch	95
5	1	Increment/Decrement	165…
	2	While	
	5	Do-while	
	6	For loop	68, 557
	11	Files input/output both	521, 607
	12	No breaks in loops ******	Absolutely not

IV. Flowchart

```
        ┌───────┐
        │ start │
        └───┬───┘
            │
    ┌───────▼───────┐
    │ Author        │
    │ Created On    │
    │ Purpose       │
    └───────┬───────┘
            │
    ┌───────▼───────┐
    │ System        │
    │ libraries     │
    └───────┬───────┘
            │
    ┌───────▼───────────┐
    │ Function Prototypes:│
    │ 18 total           │
    └───────┬───────────┘
            │
        ┌───▼───┐
        │ main  │
        └───┬───┘
            │
    ┌───────▼───────┐
    │ Switch menu:  │
    │    Tutorial   │
    │    Aboutprog  │
    │    triviagame │
    └───────────────┘
```

gameTutorial()

aboutProg()

triviaGame()

question1()

question2()

question3()

question4()

question5()

initBonus()   TRUE

gameSolution()

Output name and score to file

bonusGameSolution()

bonusQ5()

bonusQ4()

bonusQ3()

bonusQ2()

bonusQ1()

gameOver()

end

6

V.   Pseudo Code

```
//*library for cin cout
//*library for string intake
//*library for input/output files

//*Main Menu Prototypes
//*Trivia Question Prototypes for 5 questions
//*Bonus Trivia Question Prototypes for 5 Questions
//*Solutions for regular questions and bonus game questions Prototypes
//*Game Over Screen Prototype

//*Program Execution
//*keeps track of user's score
//*keeps track of user's correctly answered questions
//*keeps track of user's incorrectly answered questions
//*hold user's name
//*notify user of game type
//*prompt user for name
//*input user's name
//*for loop to welcome user
//*game menu function call also initiates entire game
   //*all other function calls are held within the preceeding functions
//*exit game

//*all future functions pass by reference for score, correct, incorrect variables
   //*initialize variable to hold menu choice
   //*hold's user's menu choice
   //*switch statement for game menu

//*gameTutorial function definition
//*description of point calculation and requirements
   //*return to game menu after this case/function is called

//*aboutProg function definition
   //*project assignment date
   //*author
   //*return to game menu after this case/ function call

//*triviaGame function definition
   //*initializes the trivia game
//*question 1 function call
   //*Questions 2-10 called in the function preceeding it

//*question 1 definition [ REPEAT FOR 4 QUESTIONS ]
   //*user answer
   //*correct answer
   //*question 1
   //*question 1 choices
   //*take in user's answer
   //*if the user's answer is correct
```

```
        //*increment user's score
        //*output current score
        //*number of questions answered correcting incremented
        //*question 2 function call
    //*if the user's answer is incorrect
        //*decrement user's score
        //*output current score
        //*number of questions answered incorrectly incremented
        //*question 2 function call
...
//*question 5 definition
    //*user answer
    //*correct answer
    //*question 5
    //*question 5 choices
    //*take in user answer
    //*if the user's answer is correct
    //*increment the user's score
        //*output current score
        //*increment correctly answered questions
    //*if the user's answer is incorrect
    //*decrement the user's score
    //*output current score
    //*increment incorrectly answered questions
    //*initBonus bool function call

    //*if bool initBonus returns true
        //*bonus question 1 function call
        //*if bool initBonus returns false
            //*if bonus round is not initialized, immediately display game solution

//*bonus 1 definition [ repeat for 4 questions ]
//*only initialized if the initBonus function returns true
    //*user answer
    //*correct answer
    //*bonus question 1
    //*bonus question 1 choices
    //*take in user answer
    //*if the user's answer is correct
        //*increment the user's score
        //*output current score
        //*continue to increment correctly answered questions
        //*bonus question 2 function call
    //*if the user's answer is incorrect
        //*decrement the user's score
        //*output current score
        //*continue to increment the incorrectly answered questions
        //*bonus question function call
 ...
//*bonus 5 definition
    //*user's answer
    //*correct answer
    //*bonus 5 question
```

```
//*bonus 5 question choices
//*take in user's choice
//*if the user's answer is correct
    //*increment the user's score
    //*output current score
    //*increment the number of correctly answered questions
//*if the user's answer is incorrect
    //*decrement the user's score
    //*output current score
    //*increment the number of incorrectly answered questions
//*if the initBonus function returns true
    //*call the function that shows both regular and
    //*bonus answers 1-10
//*if the initBonus function returns false
    //*call the function that shows the regular trivia
    //*game answers 1-5
//*initBonus function definition
    //*initialize variable to hold boolean value
    //*if score is >= 400 i.e., 4 questions are answered correctly
        //*initBonus returns true and bonus round is initialized
    //*otherwise initBonus returns false
        //*bonus round is not initialized
    //*returns the value calculated

//*gameSolution function definition
//*outputs the  solution to the regular questions
    //*Reading from file
    //*open the answers.txt file
    //*initialize variable to hold data in answers.txt file
    //*read answer to question 1
    //*output
    ...
    //*answer to question 5
    //*output
    //*close answers.txt
    //*gameOver function call

//*bonusgameSolution function definition
//*outputs the solution to the regular questions and bonus questions
    //*Reading from file
    //*open answersbonus.txt file
    //*initialize character to hold data in answersbonus.txt file
    //*answer to question 1
    //*output
    ...
    //*answer to bonus question 5
    //*output
    //*close answersbonus.txt

    //*gameOver function call

//*gameOver function definition
    //*for loops for cat output bc why not!
```

```
//*display user's final score
//*if bonus round initiated
    //*display total increment of correctly answered questions
    //*total questions
    //*percentage of correct questions
    //*total calculation
    //*percentage calculation
   //display percentage
//*if bonus round was not initiated
    //*display user's final score
    //*display total increment of correctly answered questions
    //*total questions
    //*percentage of correct questions
    //*total calculation
    //*percentage calculation
    //display percentage

//*fileout initialized of type oftsream
//*output to scores.txt
//*output name of the user
//*output score of the user
```

VI.   Code

```cpp
/*
 * File:   triviagame10.cpp
 * Author: Nichole Medero
 * Created on October 29, 2018, 12:59 PM
 * Purpose: CIS5 Project 1 Trivia Game //* Version 10
 */

/*
 *PSEUDOCODE:
 * 1. Declare Variables
 * 2. Get Player name
 * 3. Switch Statements to navigate throughout the game
 *     (e.g., main menu, tutorial, about programmer, etc(?))
 * 4. Function for output in each case of switch statement
 * 5. Trivia Game Function, display only one question while it is unanswered
 * 6. Separate function for each question (YES)
 * 7. If user's sore is above X, initiate bonus questions round. (boolean function)
 * 8. Once user completes game, output solution from answers.txt input file
 * 9. Write user's name and score to scores.txt output file
 */

#include <iostream> //*library for cin cout
#include <string>  //*library for string intake
#include <fstream> //*library for input/output files

using namespace std;

//*Main Menu Prototypes
    void gameMenu(int &score, int &correct, int &incorrect, string name);
    void gameTutorial(int &score, int &correct, int &incorrect, string name);
    void aboutProg(int &score, int &correct, int &incorrect, string name);
    void triviaGame(int &score, int &correct, int &incorrect, string name);

//*Trivia Question Prototypes for 5 questions
    void question1(int &score, int &correct, int &incorrect, string name);
    void question2(int &score, int &correct, int &incorrect, string name);
    void question3(int &score, int &correct, int &incorrect, string name);
    void question4(int &score, int &correct, int &incorrect, string name);
    void question5(int &score, int &correct, int &incorrect, string name);
```

```cpp
//*Bonus Trivia Question Prototypes for 5 Questions
    bool initBonus(int score);
    void bonusQ1(int &score, int &correct, int &incorrect, string name);
    void bonusQ2(int &score, int &correct, int &incorrect, string name);
    void bonusQ3(int &score, int &correct, int &incorrect, string name);
    void bonusQ4(int &score, int &correct, int &incorrect, string name);
    void bonusQ5(int &score, int &correct, int &incorrect, string name);

//*Solutions for regular questions and bonus game questions Prototypes
    void gameSolution(int &score, int &correct, int &incorrect, string name);
    void bonusgameSolution(int &score, int &correct, int &incorrect, string name);

//*Game Over Screen Prototype
    void gameOver(int &score, int &correct, int &incorrect, string name);

//*Program Execution Begins Here
int main(int argc, char** argv) {

    int score = 0; //*keeps track of user's score
    int correct = 0; //*keeps track of user's correctly answered questions
    int incorrect = 0; //*keeps track of user's incorrectly answered questions
    string name; //*hold user's name

    cout<<"Hello! Welcome to the CIS-5 NASA Trivia Game!"<<endl; //*notify user of game type
    cout<<"What is your name, human?"<<endl; //*prompt user for name
    cin>>name; //*input user's name

    for (int i = 0; i < 3; i ++) { //*for loop to welcome user

        cout<<name<<"? What a lovely name? Welcome!"<<endl;

    }

    gameMenu(score, correct, incorrect, name); //*game menu function call
    //*all other function calls are held within the preceeding functions

    //*exit game
    return 0;
}


void gameMenu(int &score, int &correct, int &incorrect, string name) {
//*all future functions pass by reference for score, correct, incorrect variables
//*as they are changed within each question # function
//*name is not passed by reference as there are no changes made to it

    int menuChoice; //*initialize variable to hold menu choice
    cout<<"\t **MAIN MENU**"<<endl;
    cout<<"Please select a number to navigate through the game's menu."<<endl;
    cout<<"1 \t Game Tutorial"<<endl;
    cout<<"2 \t About the Programmer"<<endl;
    cout<<"3 \t Start Trivia Game"<<endl;
    cin>>menuChoice; //*hold's user's menu choice
```

```cpp
    switch (menuChoice) { //*switch statement for game menu

        case 1: //*tutorial case 1
            gameTutorial(score, correct, incorrect, name);break;
        case 2: //*about the programmer case 2
            aboutProg(score, correct, incorrect, name);break;
        case 3: //*initialize game case 3
            triviaGame(score, correct, incorrect, name);break;
        default:
            cout<<"That is not a valid menu choice."<<endl;
            //*please read the instructions and follow valid input requirements

    }

}

void gameTutorial(int &score, int &correct, int &incorrect, string name) {
//*gameTutorial function definition

    cout<<"\t **GAME TUTORIAL**"<<endl; //*description of point calculation and requirements
    cout<<"Each question, answered correctly, is worth 100 points."<<endl;
    cout<<"Each question, answered incorrectly, is a 50 point deduction."<<endl;
    cout<<"All questions are multiple choice. Be sure to input a single character."<<endl;
    cout<<"Try to get at least 4 questions correct to release a bonus round of questions!"<<endl;
    cout<<"*********************************************"<<endl;

    gameMenu(score, correct, incorrect, name);
    //*return to game menu after this case/function is called

}

void aboutProg(int &score, int &correct, int &incorrect, string name) {
//*aboutProg function definition

    cout<<"This project is for CIS-5 of Fall 2018."<<endl; //*project assignment date
    cout<<"Written by Nichole Medero."<<endl; //*HI, THAT'S ME :)
    cout<<"*********************************************"<<endl;

    gameMenu(score, correct, incorrect, name);
    //*return to game menu after this case/ function call

    }

void triviaGame(int &score, int &correct, int &incorrect, string name) {
//*triviaGame function definition
//*initializes the trivia game

    question1(score, correct, incorrect, name); //*question 1 function call
                            //*arguments passed and initialized to 0
                            //*for the first question
    //*Questions 2-10 called in the function preceeding it
```

```cpp
}

void question1(int &score, int &correct, int &incorrect, string name) { //*question 1 definition

    char userA; //*user answer
    char ans = 'a'; //*correct answer
    cout<<"*********************************************"<<endl;
    cout<<"Who made the first U.S. spacewalk?"<<endl; //*question 1
    cout<<"a. \t Ed White"<<endl; //*question 1 choices
    cout<<"b. \t Nichole Medero"<<endl;
    cout<<"c. \t You"<<endl;
    cout<<"d. \t None of the above"<<endl;
    cin>>userA; //*take in user's answer

    if(userA == ans) { //*if the user's answer is correct
        cout<<"Correct answer!"<<endl;
        score += 100; //*increment user's score
        cout<<"Your score is now "<<score<<"!"<<endl; //*output current score
        correct++; //*number of questions answered correcting incremented

        question2(score, correct, incorrect, name); //*question 2 function call

    } else { //*if the user's answer is incorrect
        cout<<"Incorrect answer!"<<endl;
        score -= 50; //*decrement user's score
        cout<<"Your score is now "<<score<<"."<<endl;  //*output current score
        incorrect++; //*number of questions answered incorrectly incremented

        question2(score, correct, incorrect, name); //*question 2 function call
    }

}

void question2(int &score, int &correct, int &incorrect, string name) { //*question 2 definition

    char userA; //*user answer
    char ans = 'b'; //*correct answer
    cout<<"*********************************************"<<endl;
    cout<<"What is the name of the largest volcano in the solar system?"<<endl; //*question 2
    cout<<"a. \t Mount St. Helens"<<endl; //*question 2 choices
    cout<<"b. \t Olympus Mons"<<endl;
    cout<<"c. \t Krakatoa"<<endl;
    cout<<"d. \t Kotopaxi"<<endl;
    cin>>userA; //*take in user's answer

    if(userA == ans) { //*if the user's answer is correct
        cout<<"Correct answer!"<<endl;
        score += 100; //*increment the user's answer
        cout<<"Your score is now "<<score<<"!"<<endl;  //*output current score
        correct++; //*correct questions incremented

        question3(score, correct, incorrect, name); //*question 3 function call
```

```cpp
    } else { //*if the user's answer is incorrect
       cout<<"Incorrect answer!"<<endl;
       score -= 50; //*decrement user's score
       cout<<"Your score is now "<<score<<"."<<endl;  //*output current score
       incorrect++; //*incorrect questions increment

       question3(score, correct, incorrect, name); //*question 3 function call
    }
}

void question3(int &score, int &correct, int &incorrect, string name) { //*question 3 definition

    char userA; //*user answer
    char ans = 'a'; //*correct answer
    cout<<"********************************************"<<endl;
    cout<<"Who was the first American woman in space?"<<endl; //*question 3
    cout<<"a. \t Sally Ride"<<endl; //*question 3 choices
    cout<<"b. \t Nichole Medero"<<endl;
    cout<<"c. \t nichole medero"<<endl;
    cout<<"d. \t NiChOlE mEdErO"<<endl;
    cin>>userA; //*take in the user's answer

    if(userA == ans) { //*if the user's answer is correct
       cout<<"Correct answer!"<<endl;
       score += 100; //*increment the user's score
       cout<<"Your score is now "<<score<<"!"<<endl;  //*output current score
       correct++; //*correct questions increment

       question4(score, correct, incorrect, name); //*question 4 function call

    } else { //*if the user's answer is incorrect
       cout<<"Incorrect answer!"<<endl;
       score -= 50; //*decrement the user's score
       cout<<"Your score is now "<<score<<"."<<endl;  //*output current score
       incorrect++; //*incorrect questions decrement

       question4(score, correct, incorrect, name); //*question 4 function call
    }
}

void question4(int &score, int &correct, int &incorrect, string name) { //*question 4 definition

    char userA; //*user answer
    char ans = 'c'; //*correct answer
    cout<<"********************************************"<<endl;
    cout<<"What is the smallest planet in our solar system?"<<endl; //*question 4
    cout<<"a. \t Earth"<<endl; //*question 4 choices
    cout<<"b. \t Mars"<<endl;
    cout<<"c. \t Mercury"<<endl;
    cout<<"d. \t Neptune"<<endl;
    cin>>userA; //*take in user's choice

    if(userA == ans) { //*if the user's answer is correct
```

```cpp
        cout<<"Correct answer!"<<endl;
        score += 100; //*increment the user's score
        cout<<"Your score is now "<<score<<"!"<<endl;  //*output current score
        correct++; //*correct questions increment

        question5(score, correct, incorrect, name); //*question 5 function call

    } else { //*if the user's answer is incorrect
        cout<<"Incorrect answer!"<<endl;
        score -= 50; //*decrement the user's score
        cout<<"Your score is now "<<score<<"."<<endl;  //*output current score
        incorrect++; //*incorrect questions increment

        question5(score, correct, incorrect, name); //*question 5 function call
    }
}

void question5(int &score, int &correct, int &incorrect, string name) { //*question 5 definition

    char userA; //*user answer
    char ans = 'b'; //*correct answer
    cout<<"*********************************************"<<endl;
    cout<<"What is the longest time a human has been sent to space?"<<endl; //*question 5
    cout<<"a. \t 3 weeks"<<endl; //*question 5 choices
    cout<<"b. \t 437 days"<<endl;
    cout<<"c. \t 9 months"<<endl;
    cout<<"d. \t 3 years"<<endl;
    cin>>userA; //*take in user answer

    if(userA == ans) { //*if the user's answer is correct

        cout<<"Correct answer!"<<endl;
        score += 100; //*increment the user's score
        cout<<"Your score is now "<<score<<"!"<<endl; //*output current score
        correct++; //*increment correctly answered questions


    } else { //*if the user's answer is incorrect

        cout<<"Incorrect answer!"<<endl;
        score -= 50; //*decrement the user's score
        cout<<"Your score is now "<<score<<"."<<endl; //*output current score
        incorrect++; //*increment incorrectly answered questions

    }

    initBonus(score); //*initBonus bool function call

    if (initBonus(score)) { //*if bool initBonus returns true

            cout<<"*********************************************"<<endl;
            cout<<"\t BONUS ROUND INITIALIZED:"<<endl;
            bonusQ1(score, correct, incorrect, name); //*bonus question 1 function call
```

```cpp
   } else { //*if bool initBonus returns false

        gameSolution(score, correct, incorrect, name);
        //*if bonus round is not initialized, immediately display game solution
   }
}

void bonusQ1(int &score, int &correct, int &incorrect, string name) {
//*bonus 1 definition
//*only initialized if the initBonus function returns true

   char userA; //*user answer
   char ans = 'c'; //*correct answer
   cout<<"How many moons are in our solar system?"<<endl; //*bonus question 1
   cout<<"a. \t 1"<<endl; //*bonus question 1 choices
   cout<<"b. \t 10"<<endl;
   cout<<"c. \t 181"<<endl;
   cout<<"d. \t 300"<<endl;
   cin>>userA; //*take in user answer

   if(userA == ans) { //*if the user's answer is correct
      cout<<"Correct answer!"<<endl;
      score += 100; //*increment the user's score
      cout<<"Your score is now "<<score<<"!"<<endl; //*output current score
      correct++; //*continue to increment correctly answered questions

      bonusQ2(score, correct, incorrect, name); //*bonus question 2 function call

   } else { //*if the user's answer is incorrect
      cout<<"Incorrect answer!"<<endl;
      score -= 50; //*decrement the user's score
      cout<<"Your score is now "<<score<<"."<<endl; //*output current score
      incorrect++; //*continue to increment the incorrectly answered questions

      bonusQ2(score, correct, incorrect, name); //*bonus question function call
   }
}

void bonusQ2(int &score, int &correct, int &incorrect, string name) { //*bonus 2 definition

   char userA; //*user's answer
   char ans = 'c'; //*correct answer
   cout<<"********************************************"<<endl;
   cout<<"What is the largest planet in our solar system?"<<endl; //*bonus question 2
   cout<<"a. \t Mercury"<<endl; //*bonus question 2 choices
   cout<<"b. \t Uranus"<<endl;
   cout<<"c. \t Jupiter"<<endl;
   cout<<"d. \t Venus"<<endl;
   cin>>userA; //*take in user answer

   if(userA == ans) { //*if the user's answer is correct
      cout<<"Correct answer!"<<endl;
```

```cpp
      score += 100; //*increment the user's score
      cout<<"Your score is now "<<score<<"!"<<endl; //*output current score
      correct++; //*increment the number of correctly answered questions

      bonusQ3(score, correct, incorrect, name); //*bonus question 3 function call

   } else { //*if the user's answer is incorrect
      cout<<"Incorrect answer!"<<endl;
      score -= 50; //*decrement the user's score
      cout<<"Your score is now "<<score<<"."<<endl; //*output current score
      incorrect++; //*increment the number of incorrectly answered questions

      bonusQ3(score, correct, incorrect, name); //*bonus question 3 function call
   }
}

void bonusQ3(int &score, int &correct, int &incorrect, string name) { //*bonus 3 definition

   char userA; //*user's answer
   char ans = 'c'; //*correct answer
   cout<<"*********************************************"<<endl;
   cout<<"How many people have walked on the moon?"<<endl; //*bonus question 3
   cout<<"a. \t 2"<<endl; //*bonus question 3 choices
   cout<<"b. \t 1"<<endl;
   cout<<"c. \t 12"<<endl;
   cout<<"d. \t 6"<<endl;
   cin>>userA; //*take in user answer

   if(userA == ans) { //*if the user's answer is correct
      cout<<"Correct answer!"<<endl;
      score += 100; //*increment the user's score
      cout<<"Your score is now "<<score<<"!"<<endl; //*output current score
      correct++; //*increment the number of correctly answered questions

      bonusQ4(score, correct, incorrect, name); //*bonus question 4 function call

   } else { //*if the user's answer is incorrect
      cout<<"Incorrect answer!"<<endl;
      score -= 50; //*decrement the user's score
      cout<<"Your score is now "<<score<<"."<<endl; //*output current score
      incorrect++; //*increment the number of incorrectly answered questions

      bonusQ4(score, correct, incorrect, name); //*bonus question 4 function call
   }
}

void bonusQ4(int &score, int &correct, int &incorrect, string name) { //*bonus 4 definition

   char userA; //*user's answer
   char ans = 'c'; //*correct answer
   cout<<"*********************************************"<<endl;
   cout<<"What was America's first space station called?"<<endl; //*bonus question 4
   cout<<"a. \t Spacelab"<<endl; //*bonus question 4choices
```

```cpp
      cout<<"b. \t NASA"<<endl;
      cout<<"c. \t Skylab"<<endl;
      cout<<"d. \t None of the above"<<endl;
      cin>>userA; //*take in user input

      if(userA == ans) { //*if the user's answer is correct
         cout<<"Correct answer!"<<endl;
         score += 100; //*increment the user's score
         cout<<"Your score is now "<<score<<"!"<<endl; //*output current score
         correct++; //*increment the number of correctly answered questions

         bonusQ5(score, correct, incorrect, name); //*bonus question 5 function call

      } else { //*if the user's answers is in
         cout<<"Incorrect answer!"<<endl;
         score -= 50; //*decrement the user's score
         cout<<"Your score is now "<<score<<"."<<endl; //*output current score
         incorrect++; //*increment the number

         bonusQ5(score, correct, incorrect, name); //*bonus question 5 function call
      }
}

void bonusQ5(int &score, int &correct, int &incorrect, string name) { //*bonus 5 definition

   char userA; //*user's answer
   char ans = 'c'; //*correct answer
   cout<<"***********************************************"<<endl;
   cout<<"How long does it take for the space shuttle to orbit Earth?"<<endl; //*bonus 5 question
   cout<<"a. \t 1 day"<<endl; //*bonus 5 question choices
   cout<<"b. \t 12 hours"<<endl;
   cout<<"c. \t 60 minutes"<<endl;
   cout<<"d. \t 5 hours"<<endl;
   cin>>userA; //*take in user's choice

   if(userA == ans) { //*if the user's answer is correct
      cout<<"Correct answer!"<<endl;
      score += 100; //*increment the user's score
      cout<<"Your score is now "<<score<<"!"<<endl; //*output current score
      correct++; //*increment the number of correctly answered questions

   } else { //*if the user's answer is incorrect
      cout<<"Incorrect answer!"<<endl;
      score -= 50; //*decrement the user's score
      cout<<"Your score is now "<<score<<"."<<endl; //*output current score
      incorrect++; //*increment the number of incorrectly answered questions

   }

   if (initBonus(score)) { //*if the initBonus function returns true

      bonusgameSolution(score, correct, incorrect, name);
      //*call the function that shows both regular and
```

```cpp
        //*bonus answers 1-10

    } else { //*if the initBonus function returns false

        gameSolution(score, correct, incorrect, name);
        //*call the function that shows the regular trivia
        //*game answers 1-5

    }
}

bool initBonus(int score) { //*initBonus function definition

    bool initBonus; //*initialize variable to hold boolean value
    if (score >= 400) { //*if score is >= 400 i.e., 4 questions are answered correctly
        initBonus = true;  //*initBonus returns true and bonus round is initialized
    } else {
        initBonus = false; //*otherwise initBonus returns false
                    //*and bonus round is not initialized
    }

    return initBonus; //*returns the value calculated
}

void gameSolution(int &score, int &correct, int &incorrect, string name) {
//*gameSolution function definition
//*outputs the  solution to the regular questions

    cout<<"*********************************************"<<endl;
        cout<<"\t GAME SOLUTION"<<endl;

        ifstream file; //*Reading from file
        file.open("answers.txt"); //*open the answers.txt file
        char sol; //*initialize variable to hold data in answers.txt file
            file >> sol;  //*read answer to question 1
                cout<<sol<<endl; //*output
            file >> sol; //*read answer to question 2
                cout<<sol<<endl; //*output
            file >> sol; //*answer to question 3
                cout<<sol<<endl; //*output
            file >> sol; //*answer to question 4
                cout<<sol<<endl; //*output
            file >> sol; //*answer to question 5
                cout<<sol<<endl; //*output
        file.close(); //*close answers.txt

    gameOver(score, correct, incorrect, name); //*gameOver function call
}

void bonusgameSolution(int &score, int &correct, int &incorrect, string name) {
//*bonusgameSolution function definition
//*outputs the solution to the regular questions and bonus questions
```

```cpp
    cout<<"*********************************************"<<endl;
        cout<<"\t GAME SOLUTION"<<endl;

        ifstream file; //*Reading from file
        file.open("answersbonus.txt"); //*open answersbonus.txt file
        char sol; //*initialize character to hold data in answersbonus.txt file
          file >> sol;  //*answer to question 1
             cout<<sol<<endl; //*output
          file >> sol; //*answer to question 2
             cout<<sol<<endl; //*output
          file >> sol; //*answer to question 3
             cout<<sol<<endl; //*output
          file >> sol; //*answer to question 4
             cout<<sol<<endl; //*output
          file >> sol; //*answer to question 5
             cout<<sol<<endl; //*output
          cout<<"--------BONUS--------"<<endl; //*bonus solution
          file >> sol; //*answer to bonus question 1
             cout<<sol<<endl; //*output
          file >> sol; //*answer to bonus question 2
             cout<<sol<<endl; //*output
          file >> sol; //*answer to bonus question 3
             cout<<sol<<endl; //*output
          file >> sol; //*answer to bonus question 4
             cout<<sol<<endl; //*output
          file >> sol; //*answer to bonus question 5
             cout<<sol<<endl; //*output
        file.close(); //*close answersbonus.txt
        gameOver(score, correct, incorrect, name); //*gameOver function call

}

void gameOver(int &score, int &correct, int &incorrect, string name) {
//*gameOver function definition


    cout<<"----------CONGRATULATIONS----------"<<endl;

  for(int i = 0; i < 2; i++) { //*for loops for cat output bc why not!

      cout<<"——————————————————————————————"<<endl;
      cout<<"——                            "<<endl;
      cout<<"——                             "<<endl;
      cout<<"——                            "<<endl;
      cout<<"——                           "<<endl;
      cout<<"                          ——"<<endl;
      cout<<"                           "<<endl;
      cout<<"                          "<<endl;
      cout<<"                         —"<<endl;
      cout<<"                        ——"<<endl;
      cout<<"                         ——"<<endl;
      cout<<"—                       ——"<<endl;
      cout<<"—                       ——"<<endl;
```

```cpp
        cout<<"▁[████████████████████████████]▁"<<endl;
        cout<<"▁[████████████████████████████]▁"<<endl;
        cout<<"▁[████████████████████████████]▁"<<endl;

        //*very important cat, if you delete the game will break!!!

    }

    cout<<"Woo! Pusheen the Cat is happy that you have completed the game, " <<name<<"!"<<endl;

    if (initBonus(score)) { //*includes scores and questions from the bonus round
                //*if applicable

        cout<<"Your final score: "<<score<<endl; //*display user's final score
        cout<<"You answered "<<correct<<" questions out of 10!"<<endl;
        //*display total increment of correctly answered questions
        int total; //*total questions
        float perc; //*percentage of correct questions
        total = correct + incorrect; //*total calculation
        perc = (correct/static_cast<float>(total)) * 100; //*percentage calculation
        cout<<"Or " << perc << "% of the questions."<<endl; //display percentage

    } else { //*if bonus round was not initiated

        cout<<"Your final score: "<<score<<endl; //*display user's final score
        cout<<"You answered "<<correct<<" questions out of 5!"<<endl;
        //*display total increment of correctly answered questions
        int total; //*total questions
        float perc; //*percentage of correct questions
        total = correct + incorrect; //*total calculation
        perc = (correct/static_cast<float>(total)) * 100; //*percentage calculation
        cout<<"Or " << perc << "% of the questions."<<endl; //display percentage

    }

    ofstream fileout; //*fileout initialized of type oftsream
    fileout.open("scores.txt"); //*output to scores.txt
    fileout << name << ":" << endl; //*output name of the user
    fileout << score; //*output score of the user
}
```