INFORMATICS INSTITUTE OF TECHNOLOGY

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Introduction to Programing – P2

DOC334

Assignment - Final Project Report

SIMPLE MATHS GAME

Python Language

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1. ASTRACT

This report is based on the python programing language. A “SIMPLE MATHS GAME” has been created using python language. In this assignment I have used many functions, loops other various commands which will make this assignment be a success.

There are few options created in this too. There is a Quick game option and Custom game option. The quick game is a simple game which gives 05 questions of addition, displays if its correct or wrong and displays the result of what you played. The Custom game option allows you to enter the number of questions you require to answer. Under custom game there are 03 sub options as easy, medium and hard. The easy option has only addition calculations of number from 1 – 10. The medium option has calculations of addition and subtraction from numbers 1-50. The hard option has calculations of numbers from 1 – 100. At the end it displays the game result which contains details of what and how the user has played. There is an option to display the game summary. It displays all the information of those who played in this game. There is an option to quit the game is necessary. The user can also quit when it is prompted too.

2. ACKNOWLEDGEMENT

This is an individual project given to test our knowledge and ability in python language. This assignment required a lot of external reading purposes. I used the internet to find many ways to solve all the problems which I faced while completing the project.

I am highly indebted to IIT for giving me an opportunity to come up with an assignment like this in-order to improve my knowledge and skills in python language. My most sincere thanks to all those who directly or indirectly helped to make this assignment to lead to a great success.

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4. INTRODUCTION

Python is a dynamically typed programing language. There are many functions, conditions and loops which can be used in-order to run the program according to the required method.

In this program I have used many user defined functions. It is a set of related statements that can perform a specific task. Functions help break our program into smaller and modular parts. As our program grows larger and larger, functions make it more organized and manageable. Furthermore, it avoids repetition of the same code and makes code reusable.

There are loops used in this program too. A loop is a used for iterating over a set of statements repeatedly. The while loop tells the computer to do something as long as it meets the condition. The condition is evaluated, and if the condition is true, the code within the block is executed. This repeats until the condition becomes false. A for loop is a programming concept that, when it's implemented, it executes a piece of code over and over again for a certain number of times, based on a sequence. It is required to enter how many times the loop should iterate.

“Import random” – This is a method used to import random numbers. As for our calculating game, we have to set up random numbers for calculations. This method helps to execute our code and displays random integers where ever necessary. Here, we should enter the maximum range out of which it should display.

“Import operators” – This method is used to import the mathematical operators. In my program, I’ve used +, -, * as the three operators. These operators should randomly execute in the custom game option.

“Import time” – This method is used in this program to make the program look attractive. I’ve used a command as *“time.sleep(_)”*. This pauses the display the number of seconds given in the bracket. It makes the program look more attractive.

5. PYTHON CODE

```
import random       #randomly imports integers needed for the game
import operator     #randomly imports operators needed for the game
import time         #randomly imports time

opt = 0
res = []    #list created to store the summary results
g = 0
u = 0
e = 0
m = 0
h = 0

#global variables used inside user defined functions
def games():
    global g
    g+=1

def quick_games():
    global u
    u+=1

def easy_games():
    global e
    e+=1

def medium_games():
    global m
    m+=1

def hard_games():
    global h
    h+=1

#user defined functions
def start():
    print("----------------MATHS GAME----------------\n")


def game_menu():
    print('1. Quick game')
    print('2. Custom game')
    print('3. Display past game details')
    print('4. Exit')
    print('\n')
    opt = input('ENTER YOUR OPTION ( 1 | 2 | 3 | 4 ): ')
```

```
End = 0

while End != 'q':   #while loop to ensure the code doesn't crash unless it is said to end the program

    try:          #try block to ensure the code doesn't crash when an invalid input is given

        if opt == '1':
            count = 0
            cor = 0
            sym="%"
            q_name = input('Enter your name : ')


            for i in range(1,6):
                num1 = random.randrange(0,11)   # start from 0. end at 10
                num2 = random.randrange(0,11)

                que1 = str(num1)+ ' + ' +str(num2)
                ans1 = num1 + num2
                print(que1, end='')
                result = int(input(" = "))
                count+=1

                if result == ans1:
                    print('Answer is correct')
                    cor+=1
                else:
                    print('Answer is incorrect. The correct answer is : ', ans1)
                print('')
            print('****GAME RESULTS****','\n')
            print('Your name is ', q_name)
            print('You got', cor, 'questions correct out of', count)
            p = (cor/count)*100
            perc = round(p,2)       #rounding off to 2 decimal places
            print('Your marks :',perc,'%\n')

            games()
            quick_games()
            res.append((q_name,perc,sym,cor,count))     #adding data into the list
            End=input('If you want to end this press "q", else press ENTER : ')
            if End == 'q':
                print('\n---GAME OVER. THANKS FOR PLAYING.---\n')

            else:
                print('')
                start()
                game_menu()

        elif opt == '2':

            q_name = input('Enter your name : ')
```

```
print("")
print('a) Easy  b) Medium  c) Hard')
diff = input("ENTER DIFFICULTY LEVEL : ")

if diff == 'a':
    count=0
    cor=0
    sym = "%"
    print("**You selected Easy mode**")
    q_no = int(input('How many questions do you want to do : '))
    print('\n')
    for i in range(q_no):
        num1 = random.randrange(0,11)   # start from 0. end at 10
        num2 = random.randrange(0,11)

        que1 = str(num1)+ ' + ' +str(num2)
        ans1 = num1 + num2
        print(que1, end='')
        result = int(input(" = "))
        count+=1

        if result == ans1:
            print('Answer is correct')
            cor+=1
        else:
            print('Answer is incorrect. The correct answer is : ', ans1)
    print('\n','****GAME RESULTS****','\n')
    print('Your name is ', q_name)
    print('You have seleced EASY mode')
    print('You got', cor, 'questions correct out of', count)

    p = (cor/count)*100
    perc = round(p,2)       #rounding off to 2 decimal places
    print('Your marks :',perc,'%\n')

    games()
    easy_games()
    res.append((q_name,perc,sym,cor,count))     #adding data into the list
    End=input('If you want to end this press "q", else press ENTER : ')
    if End == 'q':
        print('\n---GAME OVER. THANKS FOR PLAYING.---\n')

    else:
        print('')
        start()
        game_menu()


elif diff == 'b':
    count=0
    cor=0
```

```
            sym = "%"
            print("**You selected Medium mode**")
            q_no = int(input('How many questions do you want to do : '))
            print('\n')
            for i in range(q_no):
                num1 = random.randrange(0,51)   # start from 0. end at 50
                num2 = random.randrange(0,51)
                oper = random.choice(r"+-")     # r is used to make it raw string. it seperates the data which is inside the string
                # This is useful when we want to have a string that contains backslash and don't want it to be treated as an escape character.

                que1 = str(num1)+ oper + str(num2)
                ans1 = eval(str(num1)+ oper + str(num2))
                print(que1, end='')
                result = int(input(" = "))
                count+=1

                if result == ans1:
                    print('Answer is correct')
                    cor+=1
                else:
                    print('Answer is incorrect. The correct answer is : ', ans1)
            print('\n','****GAME RESULTS****','\n')
            print('Your name is ', q_name)
            print('You have played the MEDIUM mode')
            print('You got', cor, 'questions correct out of', count)
            p = (cor/count)*100
            perc = round(p,2)       #rounding off to 2 decimal places
            print('Your marks :',perc,'%\n')

            games()
            medium_games()
            res.append((q_name,perc,sym,cor,count))     #adding data into the list
            End=input('If you want to end this press "q", else press ENTER : ')
            if End == 'q':
                print('\n---GAME OVER. THANKS FOR PLAYING.---\n')

            else:
                print('')
                start()
                game_menu()

        elif diff == 'c':
            sym = "%"
            count=0
            cor=0
            print("**You selected Hard mode**")
            q_no = int(input('How many questions do you want to do : '))
            print('\n')
            for i in range(q_no):
```

```
            num1 = random.randrange(0,101)  # start from 0. end at 100
            num2 = random.randrange(0,101)
            oper = random.choice(r"+-*")    # r is used to make it raw string. it seperates the data
which is inside the string.
            # This is useful when we want to have a string that contains backslash and don't want it to
be treated as an escape character.

            que1 = str(num1)+ oper + str(num2)
            ans1 = eval(str(num1)+ oper + str(num2))

            print(que1, end='')
            result = int(input(" = "))
            count+=1

            if result == ans1:
               print('Answer is correct')
               cor+=1
            else:
               print('Answer is incorrect. The correct answer is : ', ans1)
         print('\n','****GAME RESULTS****','\n')
         print('Your name is ', q_name)
         print('You have played the HARD mode')
         print('You got', cor, 'questions correct out of', count)
         p = (cor/count)*100
         perc = round(p,2)       #rounding off to 2 decimal places
         print('Your marks :',perc,'%\n')

         games()
         hard_games()
         res.append((q_name,perc,sym,cor,count))     #adding data into the list
         End=input('If you want to end this press "q", else press ENTER : ')
         if End == 'q':
            print('\n---GAME OVER. THANKS FOR PLAYING.---\n')

         else:
            print('')
            start()
            game_menu()
      else:
         print('\n','**Invalid  option**','\n')
         game_menu()


   elif opt == '3':
      print('\n','                ****GAME SUMMARY****','\n \n')
      print('NAME              PERCENTAGE    CORRECT    No. OF QUESTIONS')
      print('-------------------------------------------------------------')
      for n,a,s,c,q in res:   #gets the data which has been stored in the list
         print(n,' '*(22-len(n)),a,s,' '*(11-len(str(a))),c,' '*(11-len(str(c))),q)   #prints the data stored in
the list
      print('\n \n')
```

```
            time.sleep(2)   #pauses for 2 seconds
            print('Total number of GAMES played -> ', g,'\n')
            time.sleep(1)

            print('\t * QUICK GAMES played -> ', u)
            time.sleep(1)
            print('\t * CUSTOM EASY GAMES played -> ', e)
            time.sleep(1)
            print('\t * CUSTOM MEDIUM GAMES played -> ', m)
            time.sleep(1)
            print('\t * CUSTOM HARD GAMES played -> ', h)


            print('\n')
            End=input('If you want to end this press "q", else press ENTER : ')
            if End == 'q':
               print('\n','---GAME OVER. THANKS FOR PLAYING.---','\n')

            else:
               print('')
               start()
               game_menu()


         elif opt == '4':
            print('You have exited the game. Thank you!')

         else:
            print('\n','**Invalid option**','\n')
            game_menu()


      except ValueError:      #when an invalid term other than the required term is entered, the code doesn't
crash
         print('\n',"Integer required. Please paly again",'\n')
         game_menu()
      break


start()
game_menu()
```

6. CONCLUSION

The functions, loops, conditions and prompting input options were successfully used in this program. The study of global variables and user defined functions made this program more efficient and made the program run easily without any difficulties. The list which I've used in this made the program more efficient or else it would have created a long process in using another method.

By completing this assignment I've come-up with various skills in python language. This enabled me to show up my knowledge and skills since I had to use all the python attributes to complete this program.

7. REFERENCES

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