Foundation certificate in Higher Education

Module: Introduction to Programming in Python – P1

Module Leader: Mr. Sudharshan Welihinda

Type of Assessment: Individual Coursework

Batch: 2022 September Batch 1

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1. INTRODUCTION ABOUT THE PROBLEM

For this number deduction game, a player must guess a 4-digit code of colored pegs within a limited number of attempts using basic logic and figure out the secret code made by the code maker. This system will use integers to represent 6 colored pegs, so the user must enter digits, and accordingly, he/she must try to guess the code maker's code within 8 attempts, or else they will not win the game. Thus, accordingly we must develop the “GameInt” game by following the instructions given coursework specifications.

1.1 Required Tasks

1. Visualize the user interface as shown in Figure 2.
2. The user should be able to start/end by selecting them as options in a menu.
3. The system should generate a random 4-digit number where each digit is in the range of 1 – 6.
4. The user should be able to enter a 4-digit number where each digit is in the range of 1 – 6.
5. The system should validate whether the user input digits are in the correct range of 1 - 6 or else it shouldn’t accept the values and should show an appropriate error message.
6. The user should be able to get a maximum amount of 8 guesses and should be able to terminate the program without reaching the 8^{th} guess (if he/she wishes) by entering ‘0000’ as the guess
7. Design and develop your “GameInt” game accordingly as mentioned above

2. PSEUDO CODE

BEGIN

1. SET Student_name= " ", option=" ",attemptNo=0, result=0,numL=[ ],guessL=[ ],repeat=0, count=8
2. INPUT “Pls enter your name:”, Student_name
3. INPUT “Do you want to begin the game? (yes/no) -”, option
4. IF option==no THEN
5. DISPLAY “Program terminated! thank you for playing”
6. ELSE
7. CONTINUE
8. ENDIF
9. WHILE option not in (“yes”, “no”) DO
10. DISPLAY “invalid input pls enter again -”
11. INPUT “Do you want to begin the game? (yes/no) -”, option
12. ENDWHILE
13. Import random
14. NumL=random.choices([1,2,3,4,5,6], k=4)
15. WHILE attemptNo!= count or option== “yes” DO
16. TRY
17. INPUT “Enter your guess for the first digit in the code”, guess1
18. INPUT “Enter your guess for the second digit in the code”, guess2
19. INPUT “Enter your guess for the third digit in the code”, guess3
20. INPUT “Enter your guess for the forth digit in the code”, guess4
21. EXCEPT ValueError
22. DISPLAY (“Invalid value”)
23. CONTINUE
24. FOR i in range (4) DO
25. IF guessL[i]<1 or guessL[i]>6 THEN
26. DISPLAY “Data entered as guess is not in the correct range pls re-enter,you will be given an extra attempt”
27. repeat=1
28. ENDIF
29. IF guessL==numL THEN
30. DISPLAY “attemptNo-“,attemptNo+1, “ guess-”,guessL, “ Result-”, “1”*4)
31. DISPLAY (“Congratulations You have won the game … You have scored xxx points.”
32. INPUT “Do you want to begin the game? (yes/no) -”, option
33. ENDIF
34. IF option== “yes” DO
35. attemptNo= -1
36. Import random
37. numL=random.choices([1,2,3,4,5,6], k=4)
38. resultL.clear( )
39. guessL.clear( )
40. ELIF option== “no”
41. DISPLAY “Thank you for playing and have a great day ! “)
42. EXIT( )

43. ELIF guessL=[0,0,0,0] THEN
44. DISPLAY “Program terminated! thank you for playing”

```
45.             attemptNo=9
46.             EXIT ( )
47.  ELIF attemptNo == count THEN
48.             DISPLAY " Number of Attempts are over "
49.             INPUT "Do you want to play another round ?", option
50.       ENDIF
        ENDIF
       ENDIF
      ENDIF
51. ELSE
52.             IF guessL[ 0 ] == numL [0] THEN
53.               resultL.append (1)
54.             ELIF guessL[0 ] in numL
55.               resultL.append( 0)
56.             ELSE
57.               resultL.append(' . ')
58.
59.             IF guessL [ 1 ] == numL [ 1 ] THEN
60.               resultL.append ( 1 )
61.             ELIF guessL [ 1 ] in numL
62.               resultL.append ( 0 )
63.             ELSE
64.              resultL. append (' . ')
65.
66.             IF guessL[ 2 ] == numL [ 2 ] THEN
67.               resultL.append ( 1 )
68.             ELIF guessL [ 2 ] in numL
69.               result.append( 0 )
70.              ELSE
71.               resultL.append(' . ')
72.
73.           IF guessL [ 3 ] == numL [ 3 ] THEN
74.             resultL.append ( 1 )
75.             ELIF guessL [ 3 ] in numL
76.             resultL.append ( 0 )
77.            ELSE
78.               resultL.append( ' . ')
79.       ENDIF
        ENDIF
       ENDIF
      ENDIF
80. IF repeat == 1 THEN
81.  count = count +1
     ENDIF
82. attemptNo=attemptNo +1
83. DISPLAY "attemptNo=", attemptNo , "              guess-",*guessL , "          Result-", *resultL
84. resultL.clear( )

END
```

3. PYTHON CODE (FINAL SOLUTION)

DOC 333 coursework.py - C:\Users\HP\Documents\DOC333 Coursework Report - 20221022\DOC 333 coursework.py (3.10.7)

File Edit Format Run Options Window Help

```
#DOC333 Coursework python code
#Name-Chenuka Sarathchandra
#student ID- 20221022

#intialising the variables

Student_name=""
attemptNo=0
option=""
numL=[]
guessL=[]
resultL=[]
result=0
repeat=0
count=8


#Making the User interface of the game

#getting the student name to be displayed
Student_name=str(input("Pls enter your name : "))
print("                                          Hi",Student_name,"  Welcome to GameInt")

print("Number to guess - XXXX","                                                                    Colour mapping: 1-White 2-Blue 3-Red 4-Yellow 5-Green 6-Purple")
#Preparing the menu for the gamer to start or quit the game
option = input("Do you want to begin the game ? (yes/no)-")
option.lower()
if (option=="no"):
    print("Program terminated ! thank you for playing ")
    exit()
while option not in ("yes", "no"):
    print("invalid input pls enter again - ")
    option = input("Do you want to begin the game? (yes/no) ?- ")
    option.lower()
    if (option == "no"):
        print(" Thank you for playing and have a great day !")
        attemptNo = 9
        exit()


#Generating a random number for the student to guess
import random
numL= random.choices([1, 2, 3, 4, 5, 6], k=4) #Random number wont be shown in the actual game but can be shown in order to test the program

#getting user input
```

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File Edit Format Run Options Window Help

```
#getting user input
while(attemptNo!=count)or(option=="yes"):
    try:
        guess1=int(input("Enter your guess for the first digit in the code :"))
        guess2=int(input("Enter your guess for the second digit in the code :"))
        guess3=int(input("Enter your guess for the third digit in the code :"))
        guess4=int(input("Enter your guess for the forth digit in the code :"))
        guessL=[guess1,guess2,guess3,guess4]
    except ValueError:
            print("Invalid value") # validates user inputs incase they enter datatypes apart from integer .
            continue
    #resetting temp variables
    resultL.clear()
    repeat=0


#validating whether the gamer entered the data in the correct rangefor i in range(4):
    for i in range(4):
        if(guessL[i]<1 or guessL[i]>6):
            print("Data entered as guess is not in the correct range pls re-enter, you will be given an extra attempt")
            repeat=1


    if(guessL==numL):
        print("attemptNo-",attemptNo+1,"    guess-",guessL,"       Result-","1"*4)
        print("Congratulations  You have won the game…  You have scored XXX points.")
        option = input("Do you want to play another round ? (yes/no):")
        option.lower()
        while option not in ("yes", "no"):
            print("invalid input pls enter again : ")
            option = input("Do you want to begin the game? (yes/no) ?-")
            option.lower()

        if (option == "yes"):
            attemptNo=-1
            #Generating a random number for the student to guess
            numL= random.choices([1, 2, 3, 4, 5, 6], k=4)
            resultL.clear()
            guessL.clear()
            print(numL)
        elif (option == "no"):
            print(" Thank you for playing and have a great day !")
            exit()

    elif (guessL ==[0,0,0,0]): # user can enter this to terminate the program
```

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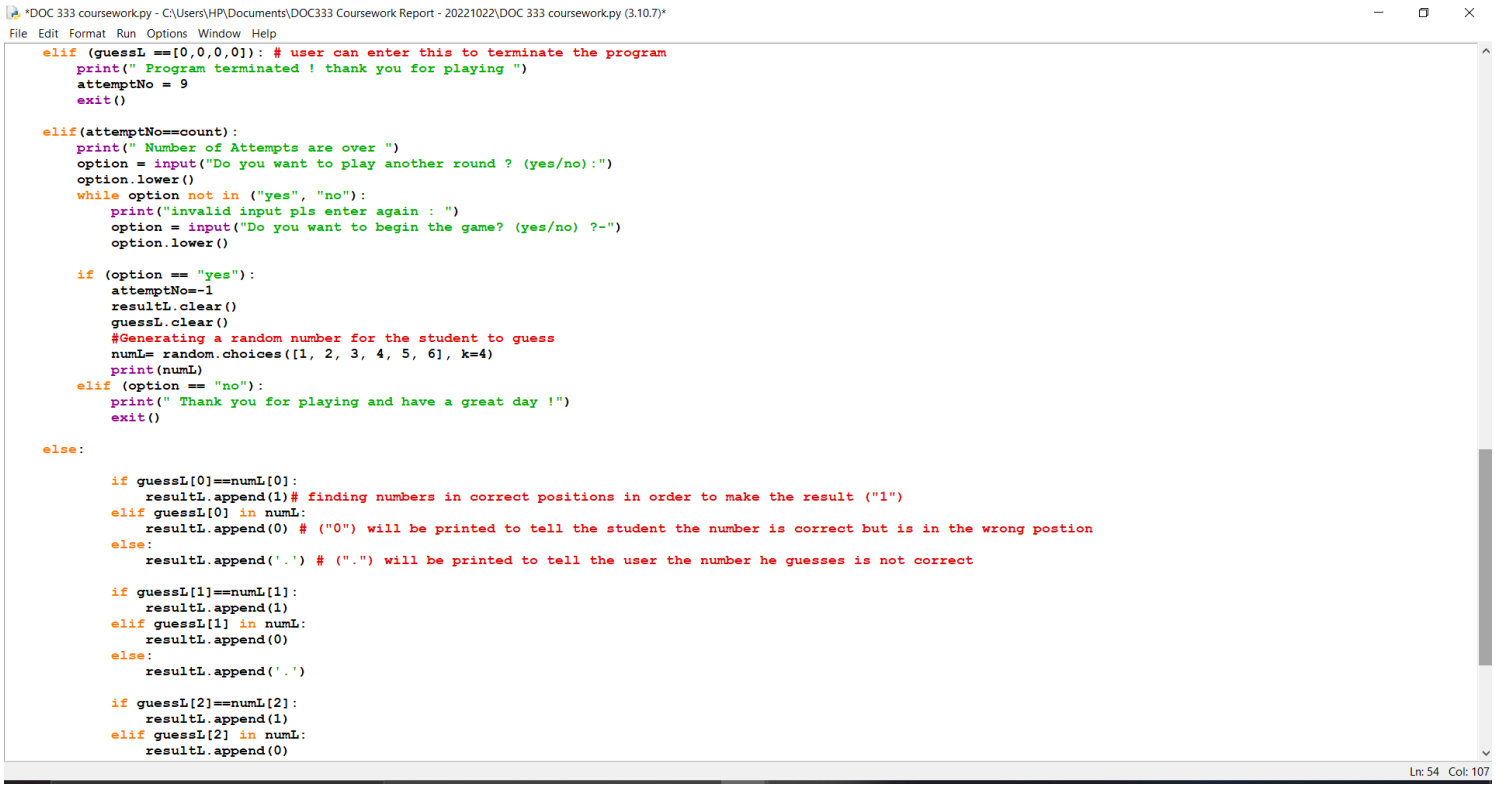
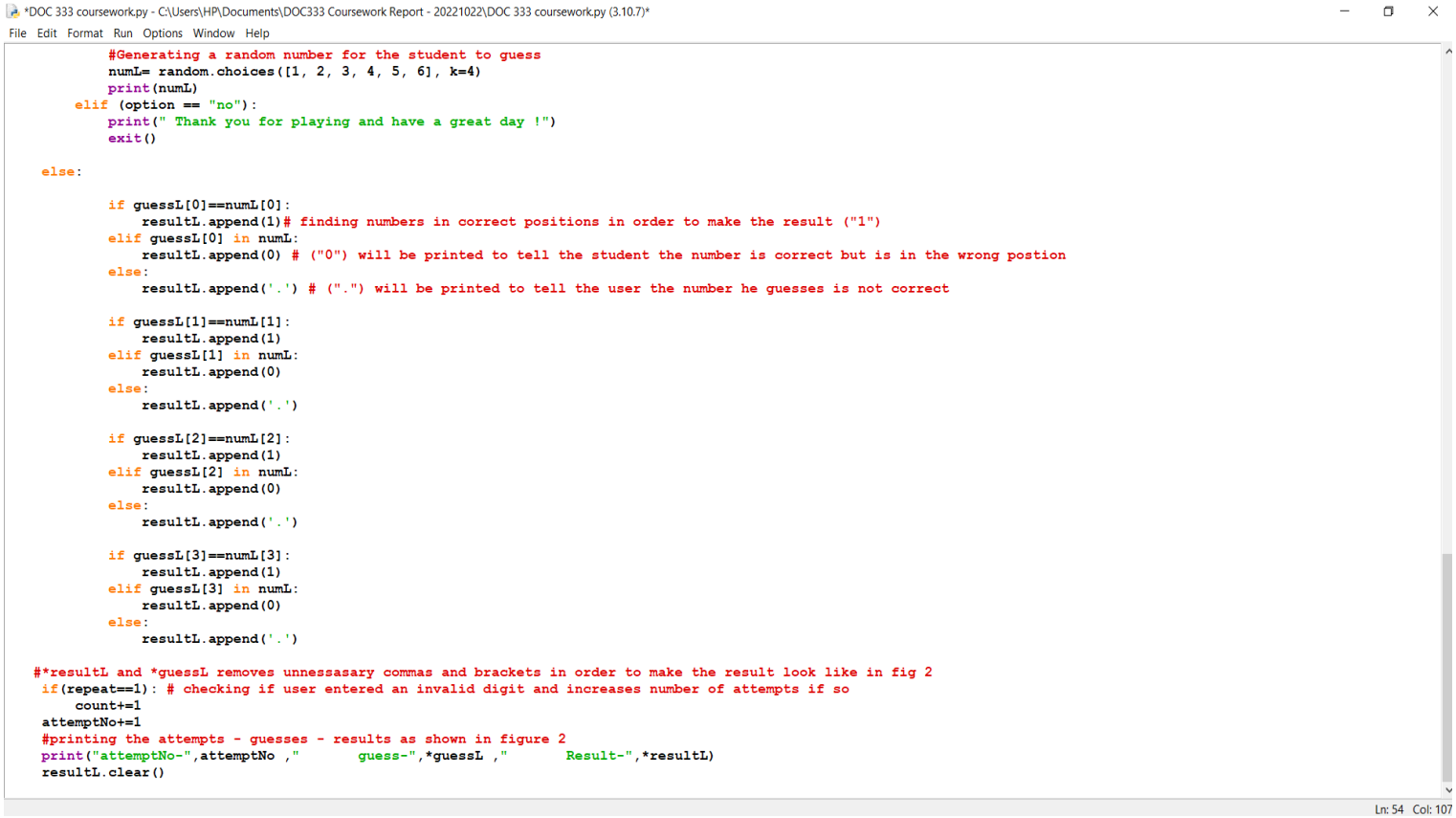

DOC 333 coursework.py - C:\Users\HP\Documents\DOC333 Coursework Report - 20221022\DOC 333 coursework.py (3.10.7)
File Edit Format Run Options Window Help
elif (guessL ==[0,0,0,0]): # user can enter this to terminate the program
print(" Program terminated ! thank you for playing ")
attemptNo = 9
exit()
elif(attemptNo==count):
print(" Number of Attempts are over ")
option = input("Do you want to play another round ? (yes/no):")
option.lower()
while option not in ("yes", "no"):
print("invalid input pls enter again : ")
option = input("Do you want to begin the game? (yes/no) ?-")
option.lower()
if (option == "yes"):
attemptNo=-1
resultL.clear()
guessL.clear()
#Generating a random number for the student to guess
numL= random.choices([1, 2, 3, 4, 5, 6], k=4)
print(numL)
elif (option == "no"):
print(" Thank you for playing and have a great day !")
exit()
else:
if guessL[0]==numL[0]:
resultL.append(1)# finding numbers in correct positions in order to make the result ("1")
elif guessL[0] in numL:
resultL.append(0) # ("0") will be printed to tell the student the number is correct but is in the wrong postion
else:
resultL.append('.') # (".") will be printed to tell the user the number he guesses is not correct
if guessL[1]==numL[1]:
resultL.append(1)
elif guessL[1] in numL:
resultL.append(0)
else:
resultL.append('.')
if guessL[2]==numL[2]:
resultL.append(1)
elif guessL[2] in numL:
resultL.append(0)
Ln: 54 Col: 107


DOC 333 coursework.py - C:\Users\HP\Documents\DOC333 Coursework Report - 20221022\DOC 333 coursework.py (3.10.7)
File Edit Format Run Options Window Help
#Generating a random number for the student to guess
numL= random.choices([1, 2, 3, 4, 5, 6], k=4)
print(numL)
elif (option == "no"):
print(" Thank you for playing and have a great day !")
exit()
else:
if guessL[0]==numL[0]:
resultL.append(1)# finding numbers in correct positions in order to make the result ("1")
elif guessL[0] in numL:
resultL.append(0) # ("0") will be printed to tell the student the number is correct but is in the wrong postion
else:
resultL.append('.') # (".") will be printed to tell the user the number he guesses is not correct
if guessL[1]==numL[1]:
resultL.append(1)
elif guessL[1] in numL:
resultL.append(0)
else:
resultL.append('.')
if guessL[2]==numL[2]:
resultL.append(1)
elif guessL[2] in numL:
resultL.append(0)
else:
resultL.append('.')
if guessL[3]==numL[3]:
resultL.append(1)
elif guessL[3] in numL:
resultL.append(0)
else:
resultL.append('.')
#*resultL and *guessL removes unnessasary commas and brackets in order to make the result look like in fig 2
if(repeat==1): # checking if user entered an invalid digit and increases number of attempts if so
count+=1
attemptNo+=1
#printing the attempts - guesses - results as shown in figure 2
print("attemptNo-",attemptNo ," guess-",*guessL ," Result-",*resultL)
resultL.clear()
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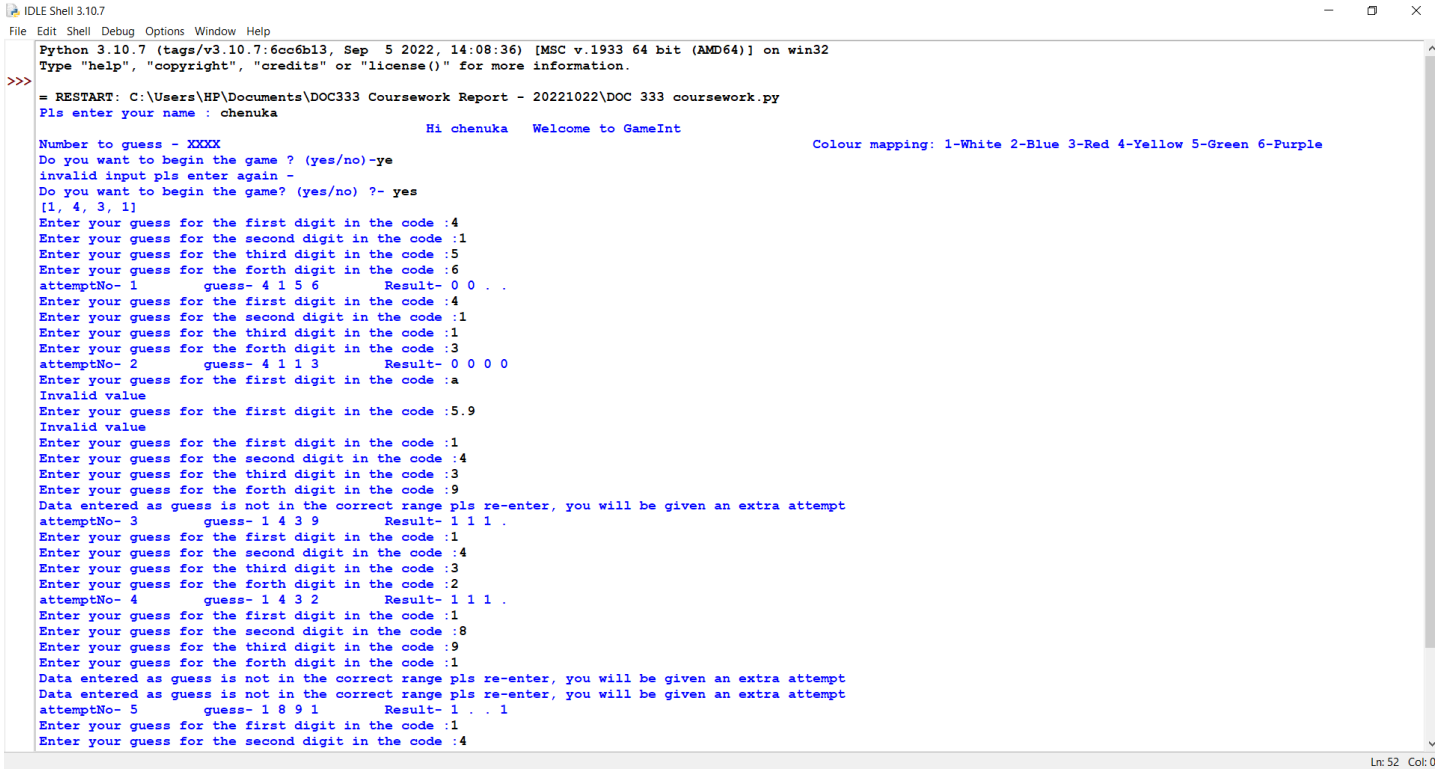
4. SCREENSHOTS OF THE WORKING PROGRAM



```
IDLE Shell 3.10.7
File  Edit  Shell  Debug  Options  Window  Help
Python 3.10.7 (tags/v3.10.7:6cc6b13, Sep  5 2022, 14:08:36) [MSC v.1933 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
= RESTART: C:\Users\HP\Documents\DOC333 Coursework Report - 20221022\DOC 333 coursework.py
Pls enter your name : chenuka
                                        Hi chenuka   Welcome to GameInt
Number to guess - XXXX                                                          Colour mapping: 1-White 2-Blue 3-Red 4-Yellow 5-Green 6-Purple
Do you want to begin the game ? (yes/no)-ye
invalid input pls enter again -
Do you want to begin the game? (yes/no) ?- yes
[1, 4, 3, 1]
Enter your guess for the first digit in the code :4
Enter your guess for the second digit in the code :1
Enter your guess for the third digit in the code :5
Enter your guess for the forth digit in the code :6
attemptNo- 1        guess- 4 1 5 6        Result- 0 0 . .
Enter your guess for the first digit in the code :4
Enter your guess for the second digit in the code :1
Enter your guess for the third digit in the code :1
Enter your guess for the forth digit in the code :3
attemptNo- 2        guess- 4 1 1 3        Result- 0 0 0 0
Enter your guess for the first digit in the code :a
Invalid value
Enter your guess for the first digit in the code :5.9
Invalid value
Enter your guess for the first digit in the code :1
Enter your guess for the second digit in the code :4
Enter your guess for the third digit in the code :3
Enter your guess for the forth digit in the code :9
Data entered as guess is not in the correct range pls re-enter, you will be given an extra attempt
attemptNo- 3        guess- 1 4 3 9        Result- 1 1 1 .
Enter your guess for the first digit in the code :1
Enter your guess for the second digit in the code :4
Enter your guess for the third digit in the code :3
Enter your guess for the forth digit in the code :2
attemptNo- 4        guess- 1 4 3 2        Result- 1 1 1 .
Enter your guess for the first digit in the code :1
Enter your guess for the second digit in the code :8
Enter your guess for the third digit in the code :9
Enter your guess for the forth digit in the code :1
Data entered as guess is not in the correct range pls re-enter, you will be given an extra attempt
Data entered as guess is not in the correct range pls re-enter, you will be given an extra attempt
attemptNo- 5        guess- 1 8 9 1        Result- 1 . . 1
Enter your guess for the first digit in the code :1
Enter your guess for the second digit in the code :4
```

```
IDLE Shell 3.10.7
File  Edit  Shell  Debug  Options  Window  Help
Do you want to begin the game ? (yes/no)-ye
invalid input pls enter again -
Do you want to begin the game? (yes/no) ?- yes
[1, 4, 3, 1]
Enter your guess for the first digit in the code :4
Enter your guess for the second digit in the code :1
Enter your guess for the third digit in the code :5
Enter your guess for the forth digit in the code :6
attemptNo- 1        guess- 4 1 5 6        Result- 0 0 . .
Enter your guess for the first digit in the code :4
Enter your guess for the second digit in the code :1
Enter your guess for the third digit in the code :1
Enter your guess for the forth digit in the code :3
attemptNo- 2        guess- 4 1 1 3        Result- 0 0 0 0
Enter your guess for the first digit in the code :a
Invalid value
Enter your guess for the first digit in the code :5.9
Invalid value
Enter your guess for the first digit in the code :1
Enter your guess for the second digit in the code :4
Enter your guess for the third digit in the code :3
Enter your guess for the forth digit in the code :9
Data entered as guess is not in the correct range pls re-enter, you will be given an extra attempt
attemptNo- 3        guess- 1 4 3 9        Result- 1 1 1 .
Enter your guess for the first digit in the code :1
Enter your guess for the second digit in the code :4
Enter your guess for the third digit in the code :3
Enter your guess for the forth digit in the code :2
attemptNo- 4        guess- 1 4 3 2        Result- 1 1 1 .
Enter your guess for the first digit in the code :1
Enter your guess for the second digit in the code :8
Enter your guess for the third digit in the code :9
Enter your guess for the forth digit in the code :1
Data entered as guess is not in the correct range pls re-enter, you will be given an extra attempt
Data entered as guess is not in the correct range pls re-enter, you will be given an extra attempt
attemptNo- 5        guess- 1 8 9 1        Result- 1 . . 1
Enter your guess for the first digit in the code :1
Enter your guess for the second digit in the code :4
Enter your guess for the third digit in the code :3
Enter your guess for the forth digit in the code :1
attemptNo- 6     guess- [1, 4, 3, 1]        Result- 1111
Congratulations  You have won the game…  You have scored XXX points.
Do you want to play another round ? (yes/no):no
 Thank you for playing and have a great day !
>>>
```

5. CONCLUSION

To summarize this report, the number deduction game was successfully developed using Python, and through continuous testing of the game crashes, errors were dealt with and fixed. Furthermore, this coursework helped me learn and understand about python programming in depth, allowing me to gain a better understanding and knowledge of this module.