THE THOUSAND DOLLAR MONEY DROP

By Keith Desouza

Synopsis

The game is called the **'Thousand Dollar Money Drop'**, which is a spin-off version of the Million Dollar Money Drop. The user will start off with 1000$ and will try to make it through of 7 rounds. In each round the user will have a choice of two topics, which is generated randomly out of 6 possible topics available. A randomly selected multiple-choice question will be selected from a database of 20 questions related to the topic will be outputted to the user. The user shall now choose how much money you place in each option, inputting their answer in 'loads' of 10$ the form A, B, C, D, with each letter corresponding to its option. The amount of money kept in the right option shall be carried forward to the next round, however, the user will lose all the money which is kept on the incorrect option (the money gets 'dropped'). The game ends after 7 rounds or when the user currently has 0$ left with them. The users name, alongside their score will be placed in an "All Time Leaderboard".

Problem Definition

The User is asked whether they want to view the leaderboard (‘L’ or ’l’), start a new quiz(‘N’ or ‘n’) or end the program(‘X’ or ‘x’).

If the User opts to start a new game:

- The user is asked to input his name
- The user’s Money(Score) and round are set to 1000 and 1 respectfully
- The user will then have a choice between two randomly generated topics out of a possible six topics (Cars, General Knowledge, Science, Geography, Technology, Sports). The algorithm will make sure that the chosen topic does not come again in the next two rounds.
- A line number corresponding to the topic will be a randomly generated from 1 to 20.
- The data in the line number of the questions database EncryptedQuestionsAndOptions.txt corresponds to the encrypted question along with its options.
- The program will decrypt the encrypted Question and option and will output it to the user’s screen.
- The user then indicates which answers they wish to risk their money on by putting their money in bundles of 10s in the format AA, BB, CC, DD, where each letter corresponds to one option. The sum of the money entered should be equal to the sum of money which the user had before the question.
- Once the user presses ENTER, any money that was placed in the incorrect option is ‘lost’ and any money kept on the right answer is kept till the next round.
- The game then repeats until the user has played 7 rounds or has 0$ left with them

- The user’s name and score get stored in an ALL TIME LEADERBOARD

If the User opts the to view the ALL TIME LEADERBOARD:

- The ALL TIME LEADERBOARD is outputted

The User is asked again asked whether they want to view the leaderboard, start a new quiz or end the program.

The game ends when the User decides to end the game by pressing “X” or “x”

Software Specification

Python is an interpreted, high-level, general-purpose programming language which is easy to learn. The python IDLE is an integrated development environment for Python. It is an application that provides several tools to aid software development. There are many features in the IDLE which can help the programmer such as:

- Automatic indentation: this makes code blocks more distinguishable from other code blocks which eases readability of the code.
- Pretty printing: The IDLE automatically colour codes keywords, function calls, comments, strings and identifiers which makes it easier for the programmer to differentiate keywords according to their category.
- Dynamic syntax checks: The IDLE underlines any syntax errors found and will display explanations about the error
- Expanding and collapsing code blocks: it saves excessive scrolling by giving the user an option to collapse blocks of statements if the code is too long.

A program library is a collection of pre-compiled routines or modules that a program can used. Program libraries can be re-used when needed which can speed up the development process. The program libraries imported for the 'Thousand Dollar Money drop" are:

- Random: This module implements pseudo-random number generators for various distributions. This is used in the program to generate two random topics out of the six random topics present and is used to generate a random line in the text file which corresponds to the Question and Options.
- OS: The OS module in Python provides a way of using operating system dependent functionality. This module allows you to interface with the underlying operating system that Python is running on.(e.g. Windows). This is used in the program to clear the output screen whenever needed. This results in having a better user-interface.

A **programming paradigm** defines the style the code follows when it is programmed. The code for the ‘Thousand-dollar money drop’ uses an object-oriented programming paradigm. This is an extension of imperative programming, which involves writing a program as a sequence of explicit states to determine how to reach a certain goal. Object-oriented paradigm is based on ‘objects’ interacting with each other. The focus is on grouping functions and data into classes. A class is a type that combines a record with the methods that work on the properties in the record. The attributes are data items of a class and are referred to as private. The methods are subroutines used of a class and are kept public so that the data can be available to the programmers. When the class is defined, it can be used to create one or more objects by instantiating the class type. The following is the class diagram used for the ‘ Thousand-dollar Money drop’.

QuestionsAndOptions		
Question	:	STRING
Answer	:	STRING
Option1	:	STRING
Option2	:	STRING
Option3	:	STRING

Constructor( )
SetQuestion( )
OutputRandomOrder( )
GetAnswer ( )		

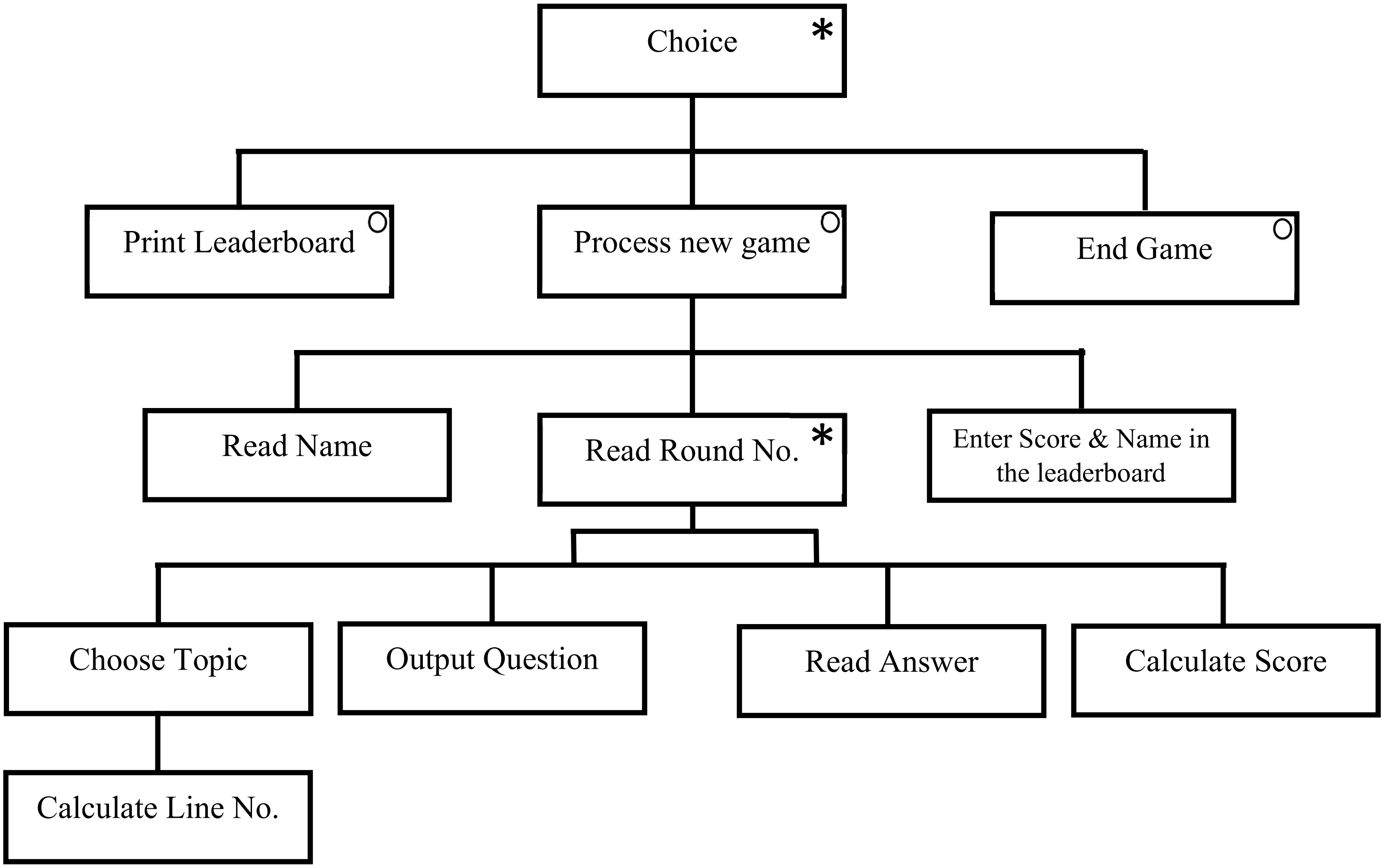
Abstract Data Type: LeaderboardListNode		
Data	:	STRING
Pointer	:	STRING
Constructor( )		

User		
Score	:	INTEGER
PreviousTopic	:	INTEGER
RoundNo	:	INTEGER
Name	:	STRING
TopicList	:	ARRAY [0:5] OF STRING
LineNoQuestionsRepeated	:	ARRAY [0:6] OF INTEGER

Constructor( )
NoQuestionsRepeated( )
SetScore( )
SetPreviousTopic( )
IncrementRound( )
GetName( )
GetScore( )
GetTopic( )
GetRoundNo( )		

System Design

Jackson Structured Programming is a method for structured programming based on correspondences between data stream structure and program structure. The following diagram is the JSP representation for the program the “Thousand Dollar Money drop



Testing Strategies

Alpha testing: this is testing of the program in house done by testers who have knowledge of both programming and software. This is done to fix any present bugs in the software, to make sure the logic of the code is correct and to optimize the code as much as possible. Alpha testing is usually done before the code is complete and before beta testing. Alpha testing can be divided into two parts:

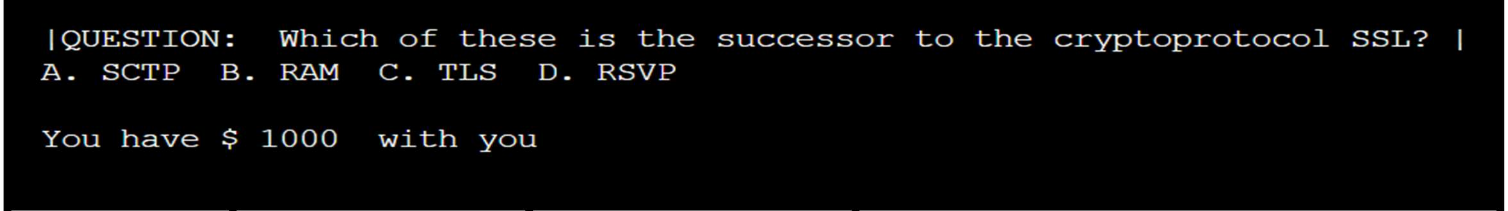
- **Black box testing:** This is comparing expected outputs with the actual program outputs. when a program is run. The tester uses test data , which can be normal, extreme or abnormal. This kind of testing only requires the inputs and the outputs of the program.
- **White box testing:** This is testing of all logical program paths in the program code. This tests the logic and the structure of the code and is done by dry running the program. This means each line of the code is examined at one step at a time and recording any changes in each variable.

Beta testing: this is testing of the program done by selected customers. A version of the program is released to a limited audience of potential users. These testers will use the program and test it in their own environments. During beta testing, the audience will provide constructive criticism on the program.

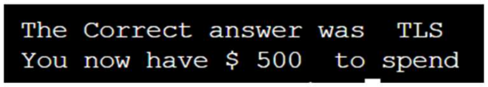
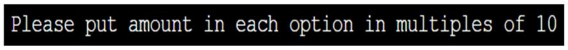
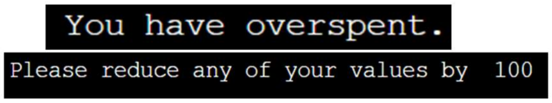
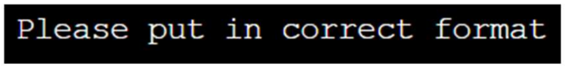
Acceptance testing: this is testing of the program by customers before sign-off. The developer of the program will make sure the program meets the needs and requirements of the customer. Any errors discovered when the program runs on the customers OS and hardware will be reported to the developer.

The following is a diagrammatical representation of BLACK BOX TESTING, which records the inputs of the user when entering their answer and its corresponding output on the screen.

BLACK-BOX TESTING



```
|QUESTION:  Which of these is the successor to the cryptoprotocol SSL? |
A. SCTP  B. RAM  C. TLS  D. RSVP

You have $ 1000  with you
```

	INPUT	EXPECTED OUTPUT	PROGRAM OUTPUT
TEST 1.	150,300,500,50	"The Correct answer was TLS you now have $500 to spend"	 The Correct answer was TLS You now have $ 500 to spend
REASON	Normal Test data. Input is in the correct format, the sum of the values in the input is equal to the score (150+300+500+50=1000) and each value above 0 in the input is a multiple of 10.		
TEST2.	0,1,999,0	"Please put amount in each option in multiples of 10"	 Please put amount in each option in multiples of 10
REASON	Extreme test data. Input is in the correct format, the sum of the values in the input is equal to the score (0,1,999,0=1000), **however**, each value above 0 in the input is **not** a multiple of 10.		
TEST3	50,150,800,100	"You have overspent, please reduce any of your values by 100"	 You have overspent. Please reduce any of your values by 100
REASON	Abnormal test data. Input is in the correct format, each value above 0 in the input is a multiple of 10 ,**however** the sum of the values in the input is **not** equal to the score (50,150,800,100 !=1000).		
TEST4	-200,thirty,600,20.6,5	"Please put in correct format"	 Please put in correct format
REASON	Abnormal test data : The input is in the incorrect format; there are 5 values instead of 4. Decimals, negative numbers or strings will be rejected by the program prompting the user to type the answer again.		

The following is a diagrammatical representation of WHITE BOX TESTING for the module Validation(AnswerChoice).

WHITE-BOX TESTING												
LINE	**TEST1.**				**TEST2.**				**TEST3.**			
	A	**B**	**C**	**D**	**A**	**B**	**C**	**D**	**A**	**B**	**C**	**D**
ThisUser.GetScore()	**1000**											
AnswerChoice	250,300,400,50				380,420,650,100				540,250,45,65,320			
try:												
A,B,C,D=AnswerChoice.split(",")	250	300	400	50	380	420	650	100				
if int(A)<0 or int(B)<0 or int(C)<0 or int(D)<0:	FALSE				FALSE							
print("Please put a value above 0")												
return(False)												
elif int(A)%10!=0 or int(B)%10!=0 or int(C)%10!=0 or int(D)%10!=0:	FALSE				FALSE							
print("Please put amount in each option in multiples of 10")												
return(False)												
elif (int(A)+int(B)+int(C)+int(D))>ThisUser.GetScore():	FALSE				TRUE							
print("You have overspent. Please reduce any of your values by" ,(int(A)+int(B)+int(C)+int(D))-ThisUser.GetScore())					PRINT "You have overspent. Please reduce any of your values by" (INT(A)+INT(B)+INT(C)+INT(D))-ThisUser.GetScore							
return(False)					RETURN FALSE							
elif (int(A)+int(B)+int(C)+int(D))<ThisUser.GetScore():	FALSE											
print("You have underspent. Please increase any of your values by ", ThisUser.GetScore()-(int(A)+int(B)+int(C)+int(D)))												
return(False)												
except:												
print("Please put in correct format")									PRINT “PLEASE PUT IN CORRECT FORMAT			
return(False)									RETURN FALSE			
return(True)	RETURN TRUE											

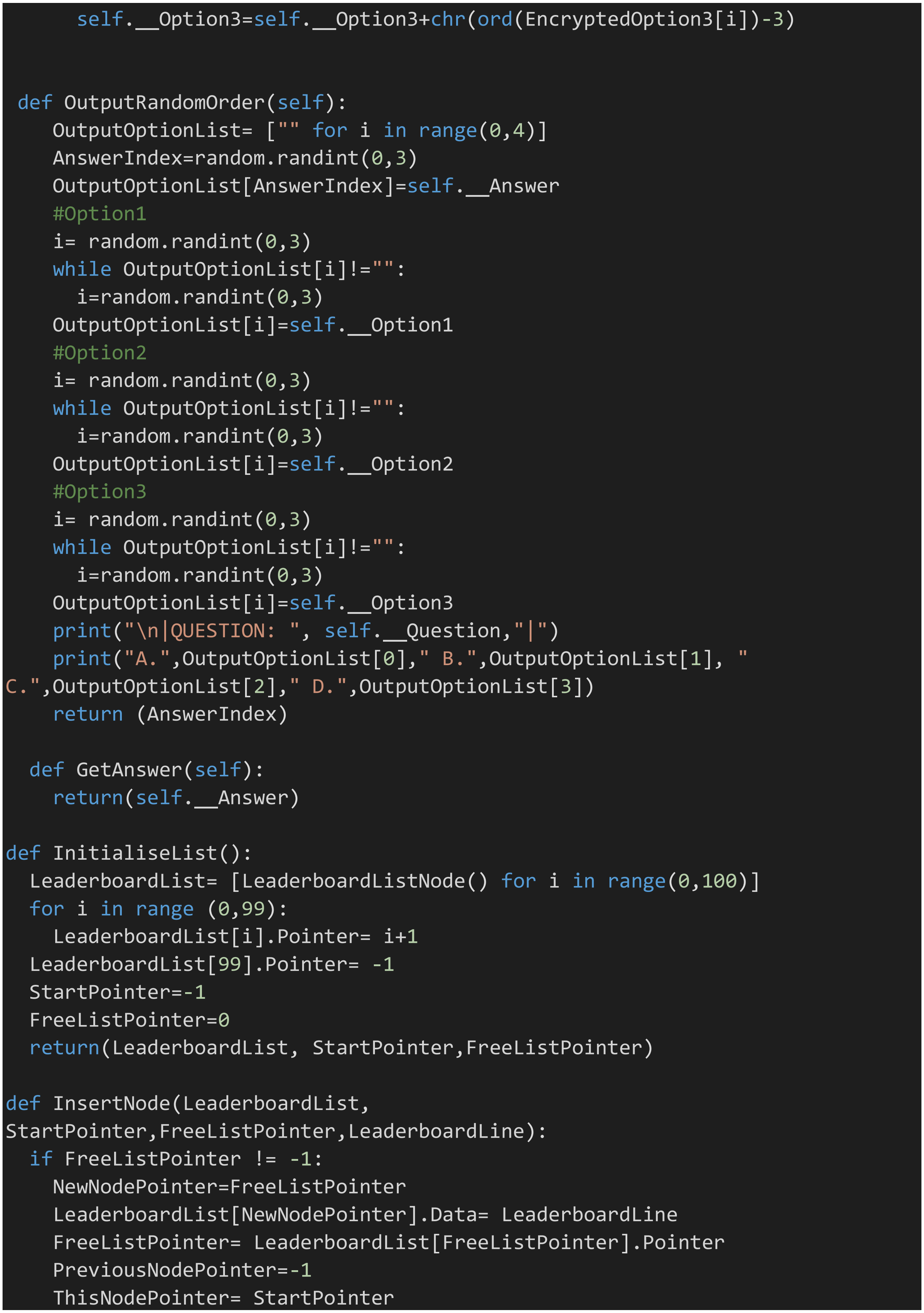
Implementation

To run the code on repl.it click here: https://csprojectkeith.keith21.repl.run/

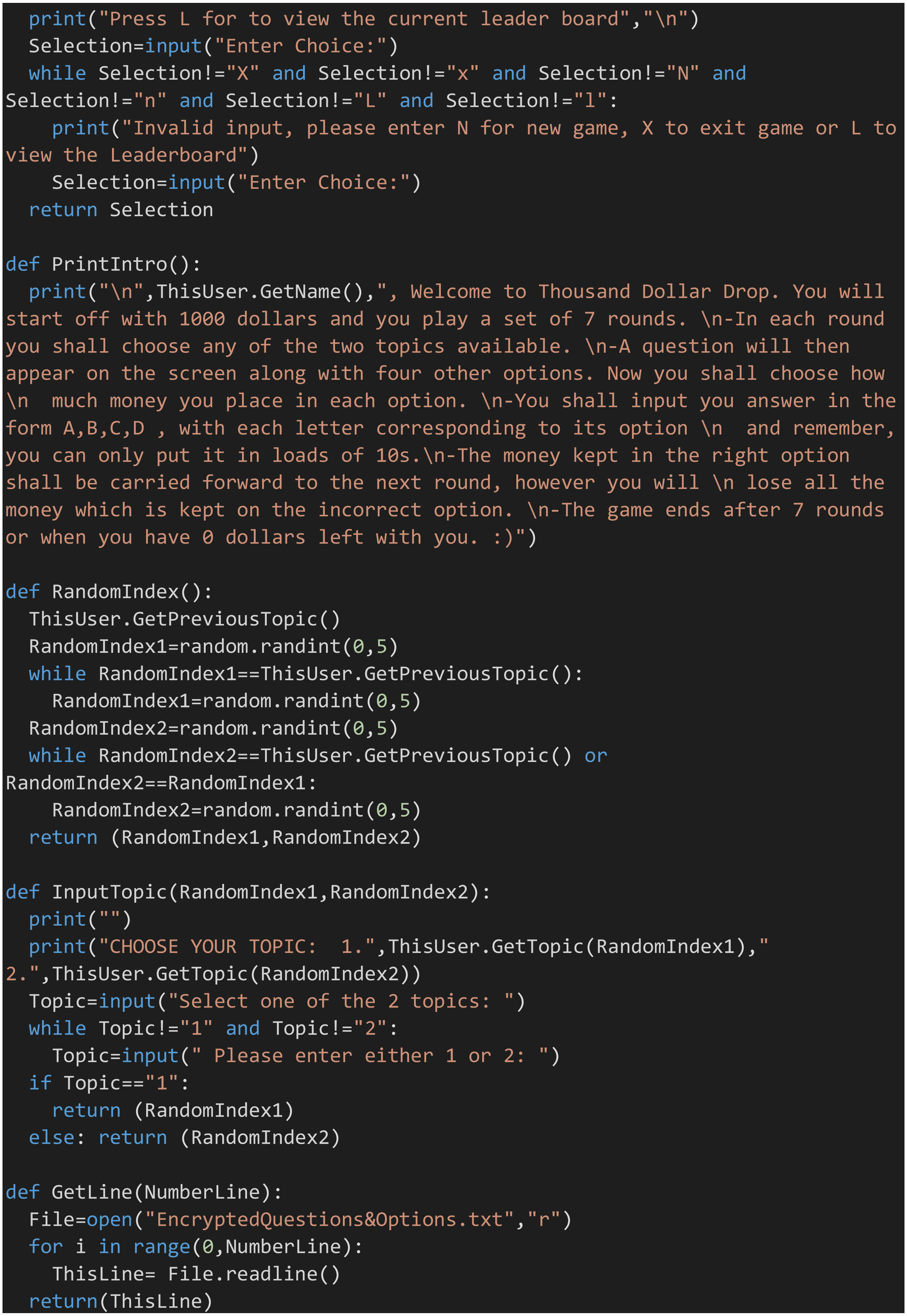
To view the code on repl.it click here: https://repl.it/@Keith21/CSProjectKeith

The following is the code for the game “Thousand Dollar Money Drop”:

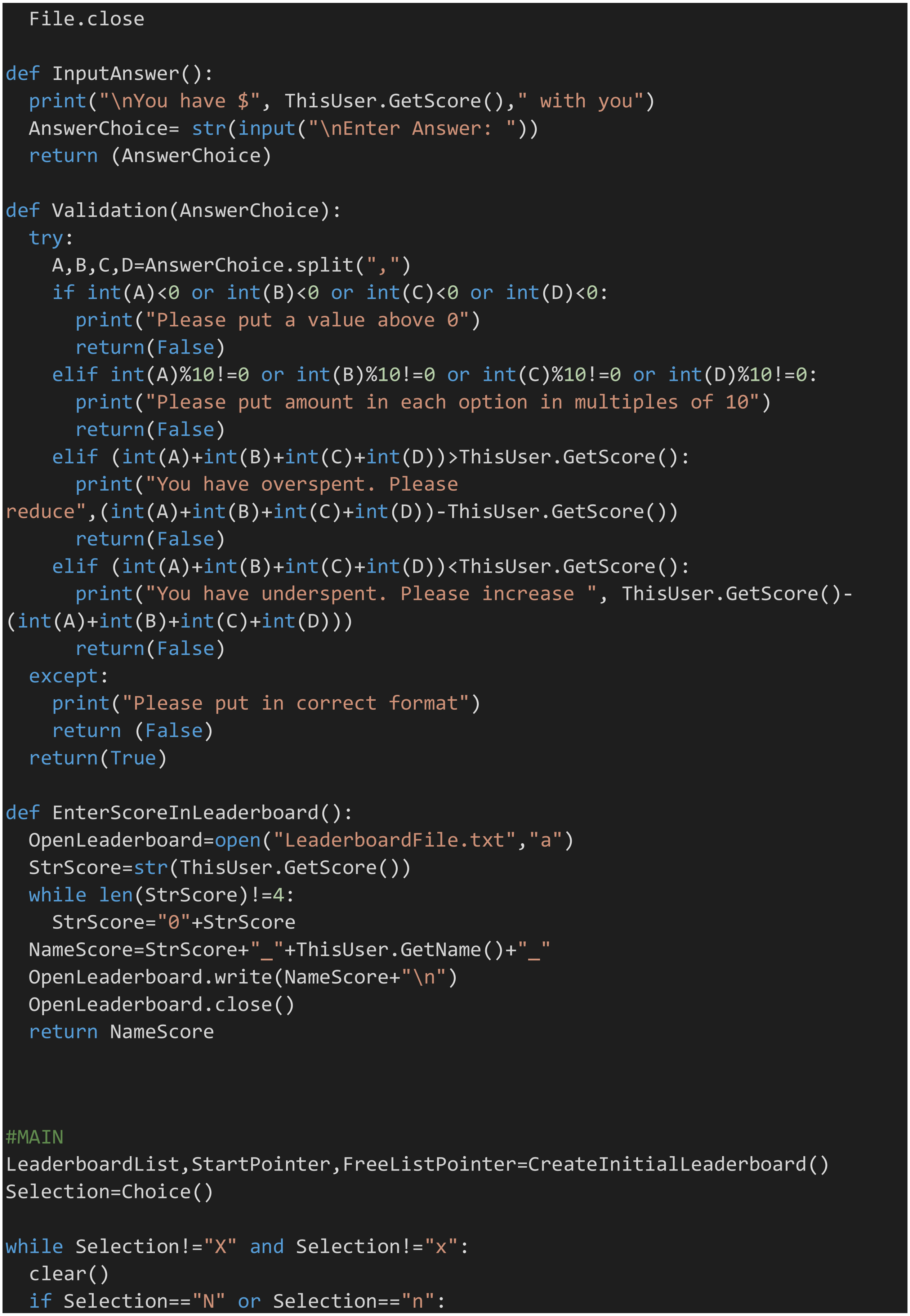
```
import random
import os
def clear():
  os.system('clear')

#CLASS DECLARATION
class LeaderboardListNode:
  def __init__(self):
    self.Data = ""
    self.Pointer= -1

#CLASS DECLARATION
class User:
  def __init__(self,n):
    self.__Score=1000
    self.__RoundNo=1
    self.__PreviousTopic=0
    self.__Name=n
    self.__TopicList=["Cars","General Knowledge","Sport","Geography","Science","Technology"]
    self.__LineNoOfQuestionsRepeated=[0 for i in range(0,7)]


  def NoQuestionsRepeated(self,LineNo):
    Valid=True
    i=0
    while i!=(self.__RoundNo)-1 and Valid==True:
      if LineNo==self.__LineNoOfQuestionsRepeated[i]:
        Valid=False
      i=i+1
    if Valid==True:
      self.__LineNoOfQuestionsRepeated[i]=LineNo
    return (Valid)

  def SetScore(self,AnswerChoice,AnswerIndex):
    A,B,C,D=AnswerChoice.split(",")
    if AnswerIndex==0:
      self.__Score=int(A)
    elif AnswerIndex==1:
      self.__Score=int(B)
    elif AnswerIndex==2:
      self.__Score=int(C)
    elif AnswerIndex==3:
      self.__Score=int(D)

  def SetPreviousTopic(self,TopicNo):
    self.__PreviousTopic=TopicNo

  def IncrementRoundNo(self):
    self.__RoundNo=self.__RoundNo+1

  def GetName(self):
    return(self.__Name)

  def GetScore(self):
    return(self.__Score)

  def GetPreviousTopic(self):
    return(self.__PreviousTopic)

  def GetTopic(self,Index):
    return(self.__TopicList[Index])

  def GetRoundNo(self):
    return(self.__RoundNo)

#CLASS DECLARATION
class QuestionAndOptions:
  def __init__(self):
    self.__Question=""
    self.__Answer=""
    self.__Option1=""
    self.__Option2=""
    self.__Option3=""

  def SetQuestionAndAnswers(self,ThisLine):
    EncryptedQuestion, EncryptedAnswer, EncryptedOption1, EncryptedOption2,
EncryptedOption3,EmptySpace=ThisLine.split("_")
    for i in range(0,len(EncryptedQuestion)):
      self.__Question=self.__Question+chr(ord(EncryptedQuestion[i])-3)
    for i in range(0,len(EncryptedAnswer)):
      self.__Answer=self.__Answer+chr(ord(EncryptedAnswer[i])-3)
    for i in range(0,len(EncryptedOption1)):
      self.__Option1=self.__Option1+chr(ord(EncryptedOption1[i])-3)
    for i in range(0,len(EncryptedOption2)):
      self.__Option2=self.__Option2+chr(ord(EncryptedOption2[i])-3)
    for i in range(0,len(EncryptedOption3)):
```



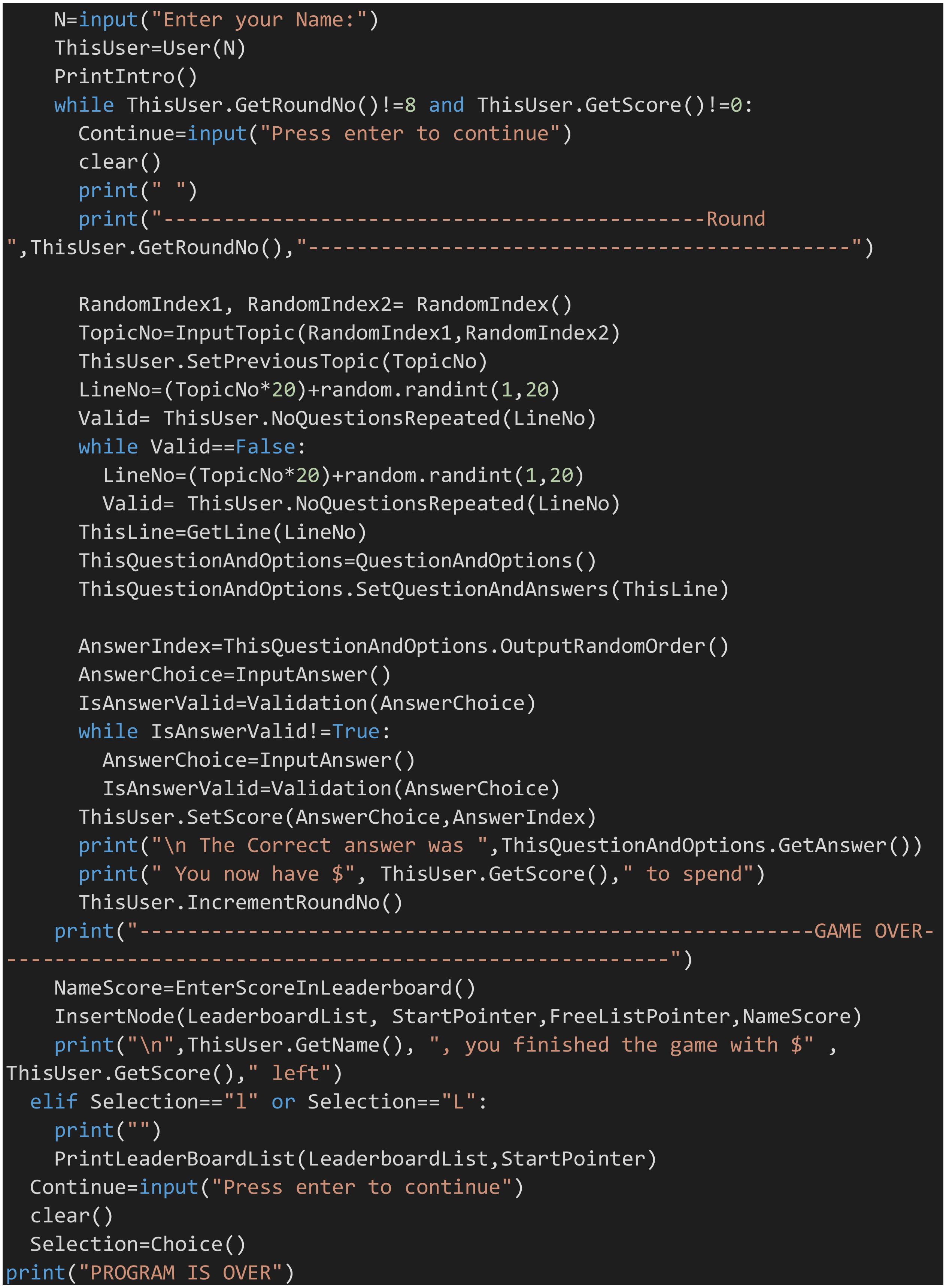
```
      self.__Option3=self.__Option3+chr(ord(EncryptedOption3[i])-3)


 def OutputRandomOrder(self):
    OutputOptionList= ["" for i in range(0,4)]
    AnswerIndex=random.randint(0,3)
    OutputOptionList[AnswerIndex]=self.__Answer
    #Option1
    i= random.randint(0,3)
    while OutputOptionList[i]!="":
      i=random.randint(0,3)
    OutputOptionList[i]=self.__Option1
    #Option2
    i= random.randint(0,3)
    while OutputOptionList[i]!="":
      i=random.randint(0,3)
    OutputOptionList[i]=self.__Option2
    #Option3
    i= random.randint(0,3)
    while OutputOptionList[i]!="":
      i=random.randint(0,3)
    OutputOptionList[i]=self.__Option3
    print("\n|QUESTION: ", self.__Question,"|")
    print("A.",OutputOptionList[0]," B.",OutputOptionList[1], "
C.",OutputOptionList[2]," D.",OutputOptionList[3])
    return (AnswerIndex)

  def GetAnswer(self):
    return(self.__Answer)

def InitialiseList():
  LeaderboardList= [LeaderboardListNode() for i in range(0,100)]
  for i in range (0,99):
    LeaderboardList[i].Pointer= i+1
  LeaderboardList[99].Pointer= -1
  StartPointer=-1
  FreeListPointer=0
  return(LeaderboardList, StartPointer,FreeListPointer)

def InsertNode(LeaderboardList,
StartPointer,FreeListPointer,LeaderboardLine):
  if FreeListPointer != -1:
    NewNodePointer=FreeListPointer
    LeaderboardList[NewNodePointer].Data= LeaderboardLine
    FreeListPointer= LeaderboardList[FreeListPointer].Pointer
    PreviousNodePointer=-1
    ThisNodePointer= StartPointer
    while ThisNodePointer!= -1 and LeaderboardList[ThisNodePointer].Data>
LeaderboardLine:
      PreviousNodePointer=ThisNodePointer
      ThisNodePointer= LeaderboardList[ThisNodePointer].Pointer
    if PreviousNodePointer==-1:
      LeaderboardList[NewNodePointer].Pointer= StartPointer
      StartPointer=NewNodePointer
    else:
      LeaderboardList[NewNodePointer].Pointer=
LeaderboardList[PreviousNodePointer].Pointer
      LeaderboardList[PreviousNodePointer].Pointer= NewNodePointer
  else:
    print (" LEADERBOARD FULL")
  return (LeaderboardList, StartPointer, FreeListPointer)

def PrintLeaderBoardList (LeaderboardList, StartPointer):
  CurrentNodePointer= StartPointer
  print("------------------------------------------LEADERBOARD:--------------
----------------------------")
  if CurrentNodePointer!=-1:
    LeaderboardPosition=1
    while CurrentNodePointer!= -1:
      Score,Name,EmptySpace=(LeaderboardList[CurrentNodePointer].Data).split(
"_")
      print (LeaderboardPosition,". ",Score,"-> ",Name)
      CurrentNodePointer= LeaderboardList[CurrentNodePointer].Pointer
      LeaderboardPosition=LeaderboardPosition+1
  else: print('LEADERBOARD IS EMPTY')
  print("---------------------------------------------------------------------
----------------------------")


def CreateInitialLeaderboard():
  LeaderboardList, StartPointer, FreeListPointer= InitialiseList()
  Leaderboard=open("LeaderboardFile.txt","r")
  LeaderboardLine=Leaderboard.readline()
  while len(LeaderboardLine)>0:
    LeaderboardList, StartPointer, FreeListPointer=
InsertNode(LeaderboardList, StartPointer, FreeListPointer, LeaderboardLine)
    LeaderboardLine=Leaderboard.readline()
  Leaderboard.close
  return LeaderboardList,StartPointer,FreeListPointer

def Choice():
  print("---------------------------------------------------------------------
----------------------------")
  print("Press N for a new game")
  print("Press X to end game")
```



```
  print("Press L for to view the current leader board","\n")
  Selection=input("Enter Choice:")
  while Selection!="X" and Selection!="x" and Selection!="N" and
Selection!="n" and Selection!="L" and Selection!="l":
    print("Invalid input, please enter N for new game, X to exit game or L to
view the Leaderboard")
    Selection=input("Enter Choice:")
  return Selection

def PrintIntro():
  print("\n",ThisUser.GetName(),", Welcome to Thousand Dollar Drop. You will
start off with 1000 dollars and you play a set of 7 rounds. \n-In each round
you shall choose any of the two topics available. \n-A question will then
appear on the screen along with four other options. Now you shall choose how
\n  much money you place in each option. \n-You shall input you answer in the
form A,B,C,D , with each letter corresponding to its option \n  and remember,
you can only put it in loads of 10s.\n-The money kept in the right option
shall be carried forward to the next round, however you will \n lose all the
money which is kept on the incorrect option. \n-The game ends after 7 rounds
or when you have 0 dollars left with you. :)")

def RandomIndex():
  ThisUser.GetPreviousTopic()
  RandomIndex1=random.randint(0,5)
  while RandomIndex1==ThisUser.GetPreviousTopic():
    RandomIndex1=random.randint(0,5)
  RandomIndex2=random.randint(0,5)
  while RandomIndex2==ThisUser.GetPreviousTopic() or
RandomIndex2==RandomIndex1:
    RandomIndex2=random.randint(0,5)
  return (RandomIndex1,RandomIndex2)

def InputTopic(RandomIndex1,RandomIndex2):
  print("")
  print("CHOOSE YOUR TOPIC:  1.",ThisUser.GetTopic(RandomIndex1),"
2.",ThisUser.GetTopic(RandomIndex2))
  Topic=input("Select one of the 2 topics: ")
  while Topic!="1" and Topic!="2":
    Topic=input(" Please enter either 1 or 2: ")
  if Topic=="1":
    return (RandomIndex1)
  else: return (RandomIndex2)

def GetLine(NumberLine):
  File=open("EncryptedQuestions&Options.txt","r")
  for i in range(0,NumberLine):
    ThisLine= File.readline()
  return(ThisLine)
```



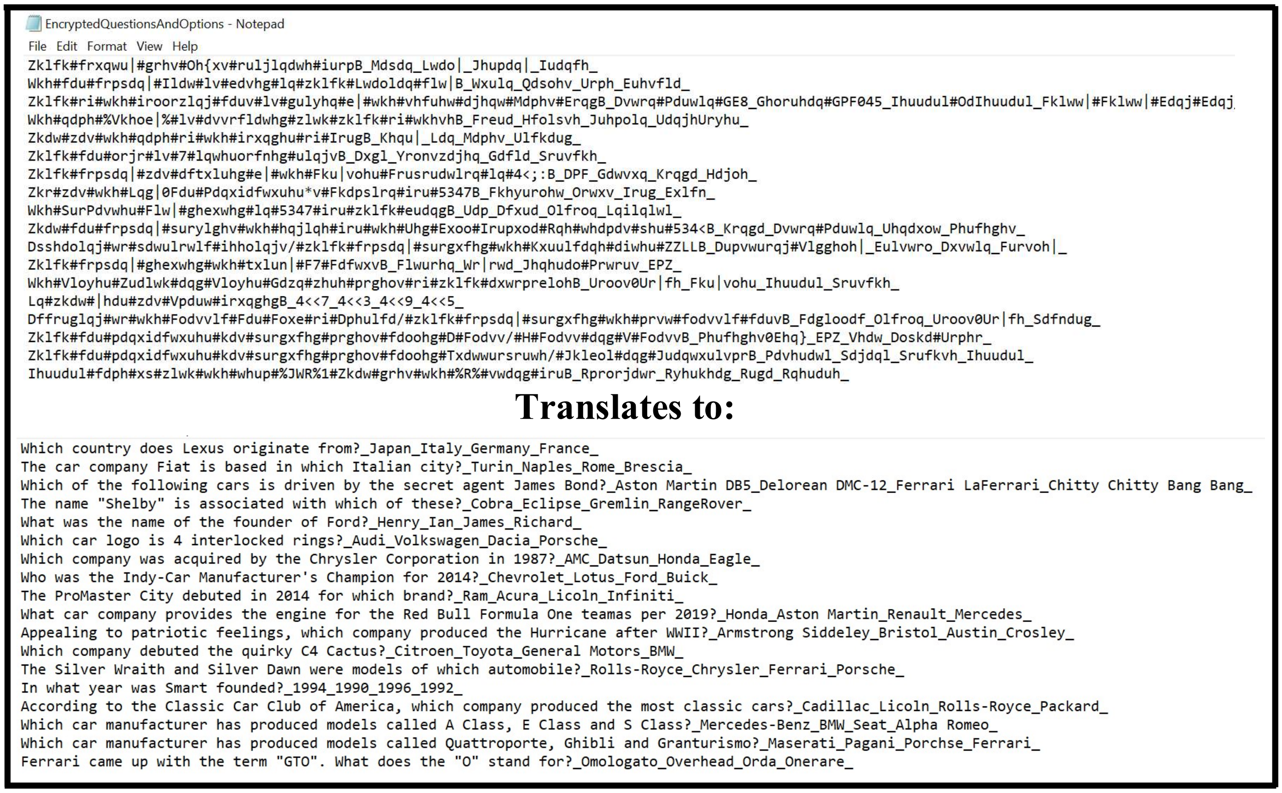
```
  File.close

def InputAnswer():
  print("\nYou have $", ThisUser.GetScore()," with you")
  AnswerChoice= str(input("\nEnter Answer: "))
  return (AnswerChoice)

def Validation(AnswerChoice):
  try:
    A,B,C,D=AnswerChoice.split(",")
    if int(A)<0 or int(B)<0 or int(C)<0 or int(D)<0:
      print("Please put a value above 0")
      return(False)
    elif int(A)%10!=0 or int(B)%10!=0 or int(C)%10!=0 or int(D)%10!=0:
      print("Please put amount in each option in multiples of 10")
      return(False)
    elif (int(A)+int(B)+int(C)+int(D))>ThisUser.GetScore():
      print("You have overspent. Please
reduce",(int(A)+int(B)+int(C)+int(D))-ThisUser.GetScore())
      return(False)
    elif (int(A)+int(B)+int(C)+int(D))<ThisUser.GetScore():
      print("You have underspent. Please increase ", ThisUser.GetScore()-
(int(A)+int(B)+int(C)+int(D)))
      return(False)
  except:
    print("Please put in correct format")
    return (False)
  return(True)

def EnterScoreInLeaderboard():
  OpenLeaderboard=open("LeaderboardFile.txt","a")
  StrScore=str(ThisUser.GetScore())
  while len(StrScore)!=4:
    StrScore="0"+StrScore
  NameScore=StrScore+"_"+ThisUser.GetName()+"_"
  OpenLeaderboard.write(NameScore+"\n")
  OpenLeaderboard.close()
  return NameScore



#MAIN
LeaderboardList,StartPointer,FreeListPointer=CreateInitialLeaderboard()
Selection=Choice()

while Selection!="X" and Selection!="x":
  clear()
  if Selection=="N" or Selection=="n":
```



```
    N=input("Enter your Name:")
    ThisUser=User(N)
    PrintIntro()
    while ThisUser.GetRoundNo()!=8 and ThisUser.GetScore()!=0:
      Continue=input("Press enter to continue")
      clear()
      print(" ")
      print("---------------------------------------------Round
",ThisUser.GetRoundNo(),"---------------------------------------------")

      RandomIndex1, RandomIndex2= RandomIndex()
      TopicNo=InputTopic(RandomIndex1,RandomIndex2)
      ThisUser.SetPreviousTopic(TopicNo)
      LineNo=(TopicNo*20)+random.randint(1,20)
      Valid= ThisUser.NoQuestionsRepeated(LineNo)
      while Valid==False:
        LineNo=(TopicNo*20)+random.randint(1,20)
        Valid= ThisUser.NoQuestionsRepeated(LineNo)
      ThisLine=GetLine(LineNo)
      ThisQuestionAndOptions=QuestionAndOptions()
      ThisQuestionAndOptions.SetQuestionAndAnswers(ThisLine)

      AnswerIndex=ThisQuestionAndOptions.OutputRandomOrder()
      AnswerChoice=InputAnswer()
      IsAnswerValid=Validation(AnswerChoice)
      while IsAnswerValid!=True:
        AnswerChoice=InputAnswer()
        IsAnswerValid=Validation(AnswerChoice)
      ThisUser.SetScore(AnswerChoice,AnswerIndex)
      print("\n The Correct answer was ",ThisQuestionAndOptions.GetAnswer())
      print(" You now have $", ThisUser.GetScore()," to spend")
      ThisUser.IncrementRoundNo()
    print("--------------------------------------------------------GAME OVER-
-------------------------------------------------------")
    NameScore=EnterScoreInLeaderboard()
    InsertNode(LeaderboardList, StartPointer,FreeListPointer,NameScore)
    print("\n",ThisUser.GetName(), ", you finished the game with $" ,
ThisUser.GetScore()," left")
  elif Selection=="l" or Selection=="L":
    print("")
    PrintLeaderBoardList(LeaderboardList,StartPointer)
  Continue=input("Press enter to continue")
  clear()
  Selection=Choice()
print("PROGRAM IS OVER")
```

Text Files: There are two text files used in the “Thousand Dollar Money Drop”.

- **EncryptedQuestions&Options.txt** : This is an encrypted text file containing the Questions and Options. Each line in the Text File is stored as Question_Answer_Option1_Option2_Option3_. To decrypt the line, the ASCII code of each character is subtracted by 3.



EncryptedQuestionsAndOptions - Notepad
File Edit Format View Help

```
Zklfk#frxqwu|#grhv#Oh{xv#ruljlqdwh#iurpB_Mdsdq_Lwdo|_Jhupdq|_Iudqfh_
Wkh#fdu#frpsdq|#Ildw#lv#edvhg#lq#zklfk#Lwdoldq#flw|B_Wxulq_Qdsohv_Urph_Euhvfld_
Zklfk#ri#wkh#iroorzlqj#fduv#lv#gulyhq#e|#wkh#vhfuhw#djhqw#Mdphv#ErqgB_Dvwrq#Pduwlq#GE8_Ghoruhdq#GPF045_Ihuudul#OdIhuudul_Fklww|#Fklww|#Edqj#Edqj
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Ihuudul#fdph#xs#zlwk#wkh#whup#%JWR%1#Zkdw#grhv#wkh#%R%#vwdqg#iruB_Rprorjdwr_Ryhukhdg_Rugd_Rqhuduh_
```
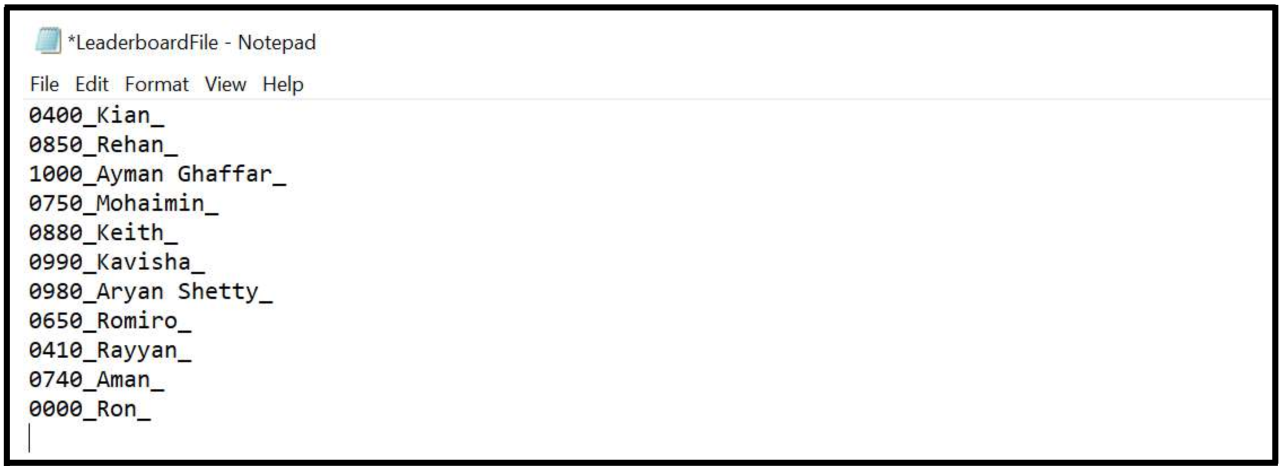

Translates to:

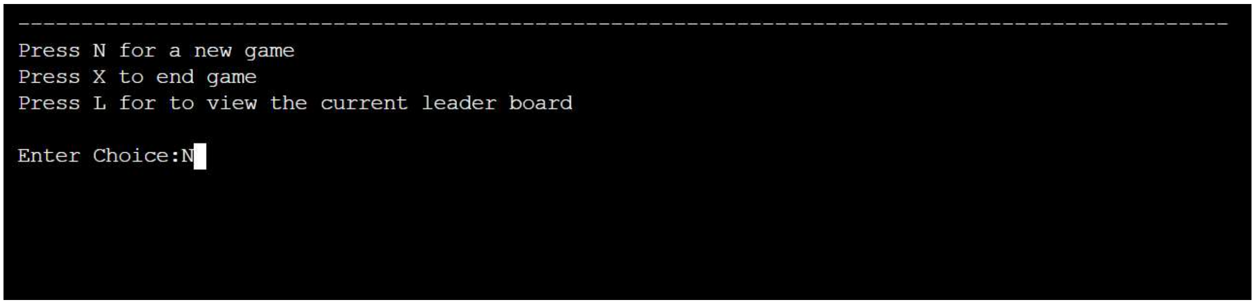
```
Which country does Lexus originate from?_Japan_Italy_Germany_France_
The car company Fiat is based in which Italian city?_Turin_Naples_Rome_Brescia_
Which of the following cars is driven by the secret agent James Bond?_Aston Martin DB5_Delorean DMC-12_Ferrari LaFerrari_Chitty Chitty Bang Bang_
The name "Shelby" is associated with which of these?_Cobra_Eclipse_Gremlin_RangeRover_
What was the name of the founder of Ford?_Henry_Ian_James_Richard_
Which car logo is 4 interlocked rings?_Audi_Volkswagen_Dacia_Porsche_
Which company was acquired by the Chrysler Corporation in 1987?_AMC_Datsun_Honda_Eagle_
Who was the Indy-Car Manufacturer's Champion for 2014?_Chevrolet_Lotus_Ford_Buick_
The ProMaster City debuted in 2014 for which brand?_Ram_Acura_Licoln_Infiniti_
What car company provides the engine for the Red Bull Formula One teamas per 2019?_Honda_Aston Martin_Renault_Mercedes_
Appealing to patriotic feelings, which company produced the Hurricane after WWII?_Armstrong Siddeley_Bristol_Austin_Crosley_
Which company debuted the quirky C4 Cactus?_Citroen_Toyota_General Motors_BMW_
The Silver Wraith and Silver Dawn were models of which automobile?_Rolls-Royce_Chrysler_Ferrari_Porsche_
In what year was Smart founded?_1994_1990_1996_1992_
According to the Classic Car Club of America, which company produced the most classic cars?_Cadillac_Licoln_Rolls-Royce_Packard_
Which car manufacturer has produced models called A Class, E Class and S Class?_Mercedes-Benz_BMW_Seat_Alpha Romeo_
Which car manufacturer has produced models called Quattroporte, Ghibli and Granturismo?_Maserati_Pagani_Porchse_Ferrari_
Ferrari came up with the term "GTO". What does the "O" stand for?_Omologato_Overhead_Orda_Onerare_
```

- **LeaderboardFile.txt**: Stores each player’s Name and Score who played the game in the format _Name(#XXXX)_Score_.

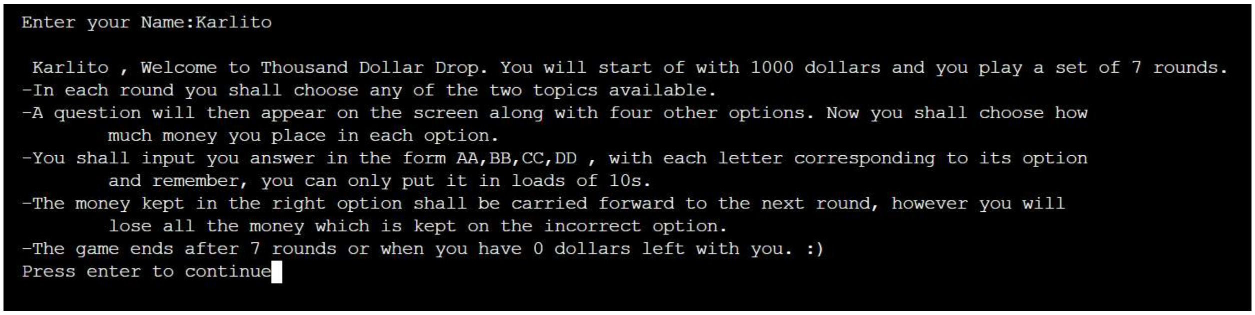


```
0400_Kian_
0850_Rehan_
1000_Ayman Ghaffar_
0750_Mohaimin_
0880_Keith_
0990_Kavisha_
0980_Aryan Shetty_
0650_Romiro_
0410_Rayyan_
0740_Aman_
0000_Ron_
```

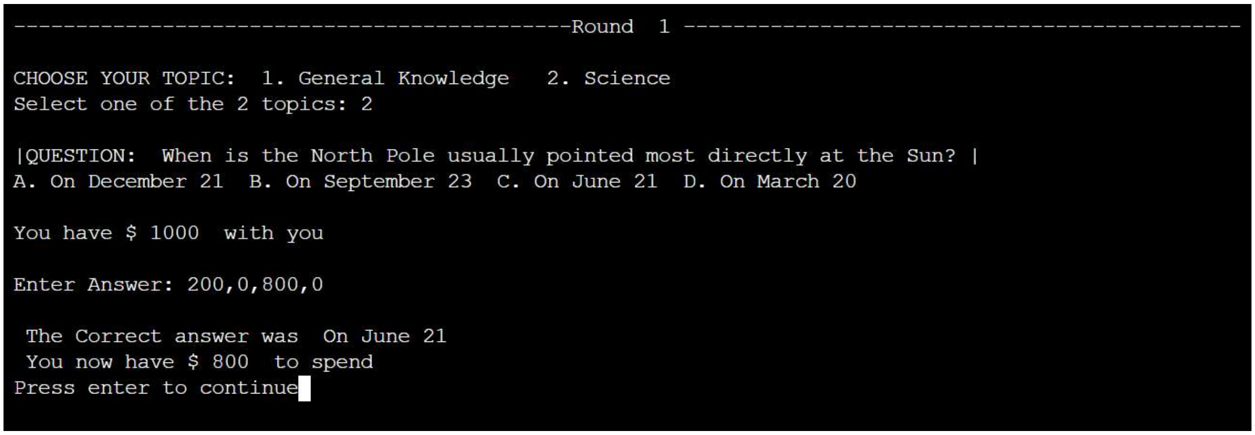
Input and Output screens:



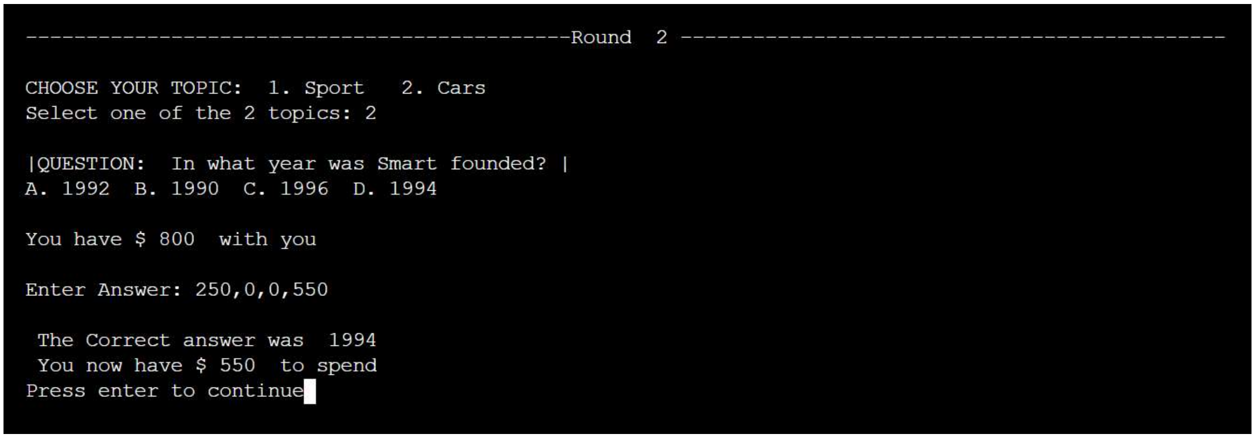
```
------------------------------------------------------------------------------------------------
Press N for a new game
Press X to end game
Press L for to view the current leader board

Enter Choice:N
```



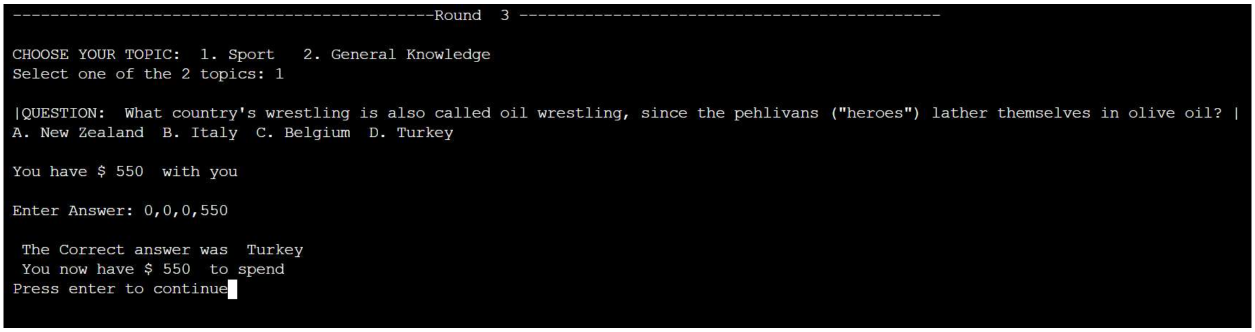
```
Enter your Name:Karlito

 Karlito , Welcome to Thousand Dollar Drop. You will start of with 1000 dollars and you play a set of 7 rounds.
-In each round you shall choose any of the two topics available.
-A question will then appear on the screen along with four other options. Now you shall choose how
        much money you place in each option.
-You shall input you answer in the form AA,BB,CC,DD , with each letter corresponding to its option
        and remember, you can only put it in loads of 10s.
-The money kept in the right option shall be carried forward to the next round, however you will
        lose all the money which is kept on the incorrect option.
-The game ends after 7 rounds or when you have 0 dollars left with you. :)
Press enter to continue
```



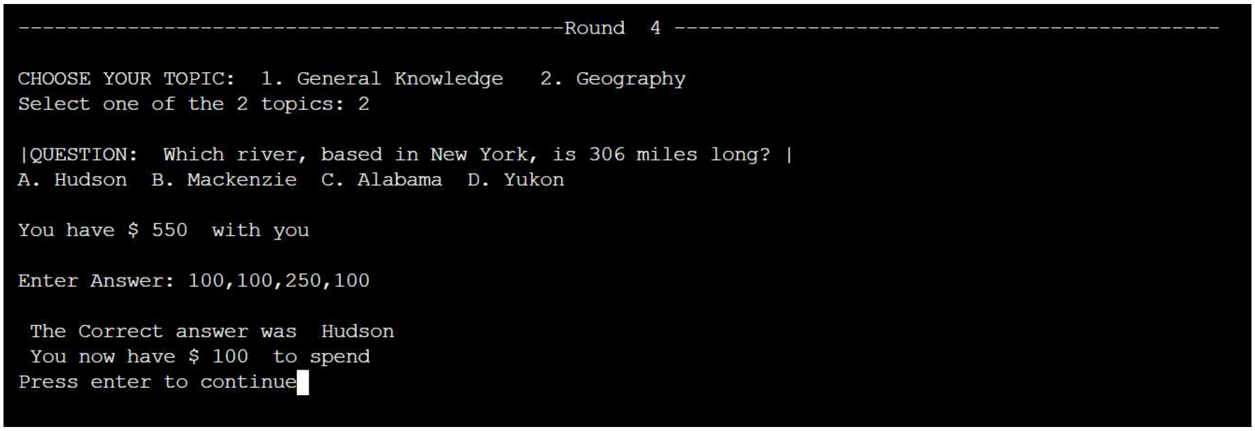
```
---------------------------------------------Round  1 ---------------------------------------------

CHOOSE YOUR TOPIC:  1. General Knowledge   2. Science
Select one of the 2 topics: 2

|QUESTION:  When is the North Pole usually pointed most directly at the Sun? |
A. On December 21  B. On September 23  C. On June 21  D. On March 20

You have $ 1000  with you

Enter Answer: 200,0,800,0

 The Correct answer was  On June 21
 You now have $ 800  to spend
Press enter to continue
```



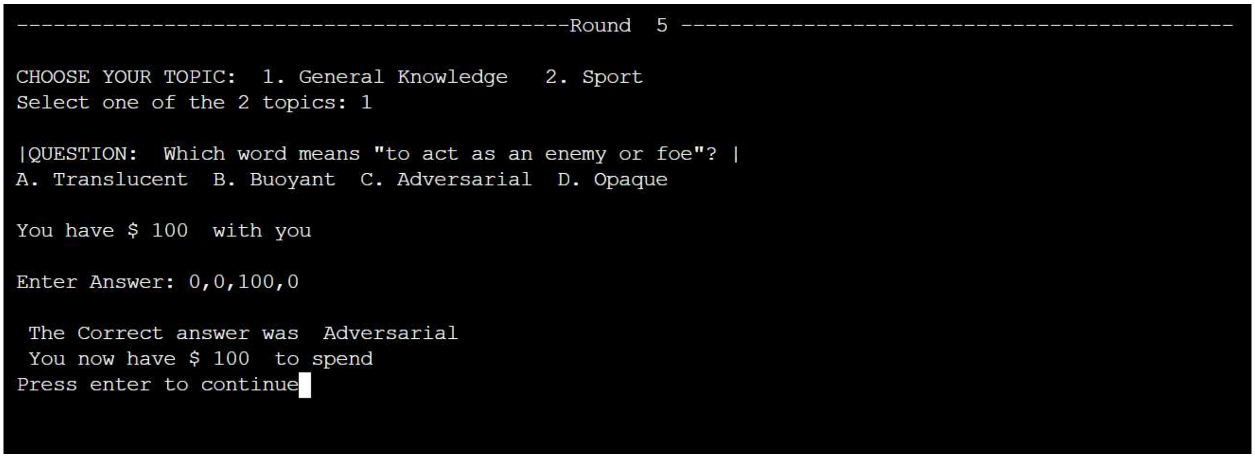
```
--------------------------------------------Round  2 --------------------------------------------

CHOOSE YOUR TOPIC:  1. Sport   2. Cars
Select one of the 2 topics: 2

|QUESTION:  In what year was Smart founded? |
A. 1992  B. 1990  C. 1996  D. 1994

You have $ 800  with you

Enter Answer: 250,0,0,550

 The Correct answer was  1994
 You now have $ 550  to spend
Press enter to continue
```



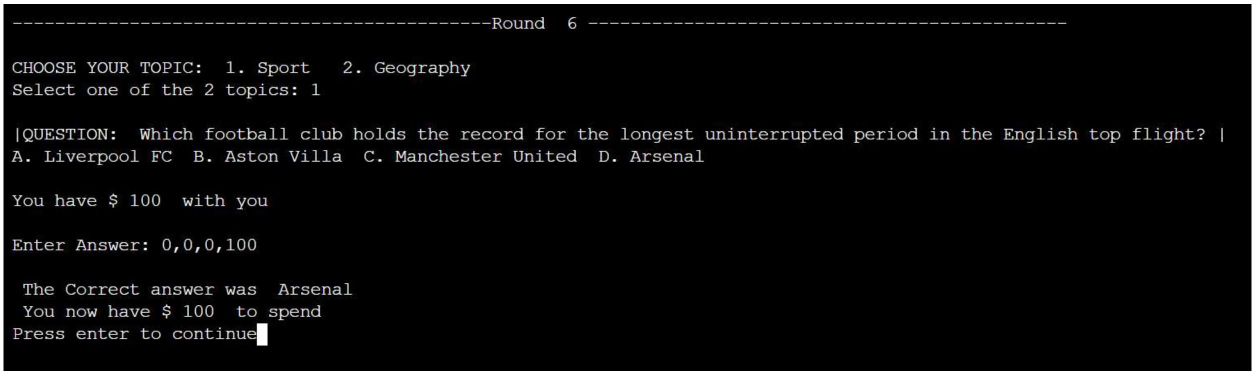
```
---------------------------------------------Round  3 ---------------------------------------------

CHOOSE YOUR TOPIC:  1. Sport   2. General Knowledge
Select one of the 2 topics: 1

|QUESTION:  What country's wrestling is also called oil wrestling, since the pehlivans ("heroes") lather themselves in olive oil? |
A. New Zealand  B. Italy  C. Belgium  D. Turkey

You have $ 550  with you

Enter Answer: 0,0,0,550

 The Correct answer was  Turkey
 You now have $ 550  to spend
Press enter to continue
```



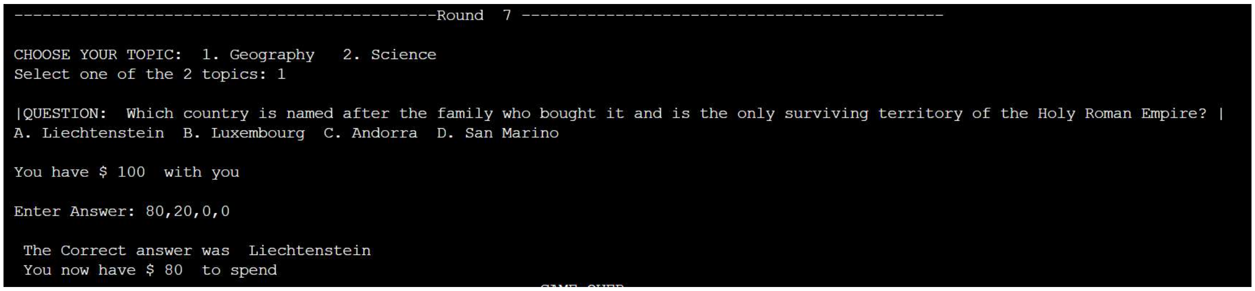
```
---------------------------------------------Round  4 ---------------------------------------------

CHOOSE YOUR TOPIC:  1. General Knowledge   2. Geography
Select one of the 2 topics: 2

|QUESTION:  Which river, based in New York, is 306 miles long? |
A. Hudson  B. Mackenzie  C. Alabama  D. Yukon

You have $ 550  with you

Enter Answer: 100,100,250,100

 The Correct answer was  Hudson
 You now have $ 100  to spend
Press enter to continue
```



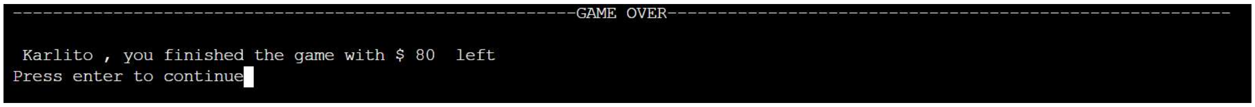
```
---------------------------------------------Round  5 ---------------------------------------------

CHOOSE YOUR TOPIC:  1. General Knowledge   2. Sport
Select one of the 2 topics: 1

|QUESTION:  Which word means "to act as an enemy or foe"? |
A. Translucent  B. Buoyant  C. Adversarial  D. Opaque

You have $ 100  with you

Enter Answer: 0,0,100,0

 The Correct answer was  Adversarial
 You now have $ 100  to spend
Press enter to continue
```



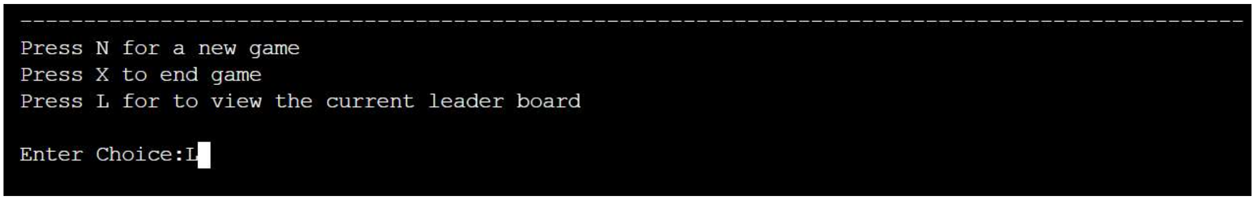
```
---------------------------------------------Round  6 ---------------------------------------------

CHOOSE YOUR TOPIC:  1. Sport   2. Geography
Select one of the 2 topics: 1

|QUESTION:  Which football club holds the record for the longest uninterrupted period in the English top flight? |
A. Liverpool FC  B. Aston Villa  C. Manchester United  D. Arsenal

You have $ 100  with you

Enter Answer: 0,0,0,100

 The Correct answer was  Arsenal
 You now have $ 100  to spend
Press enter to continue
```



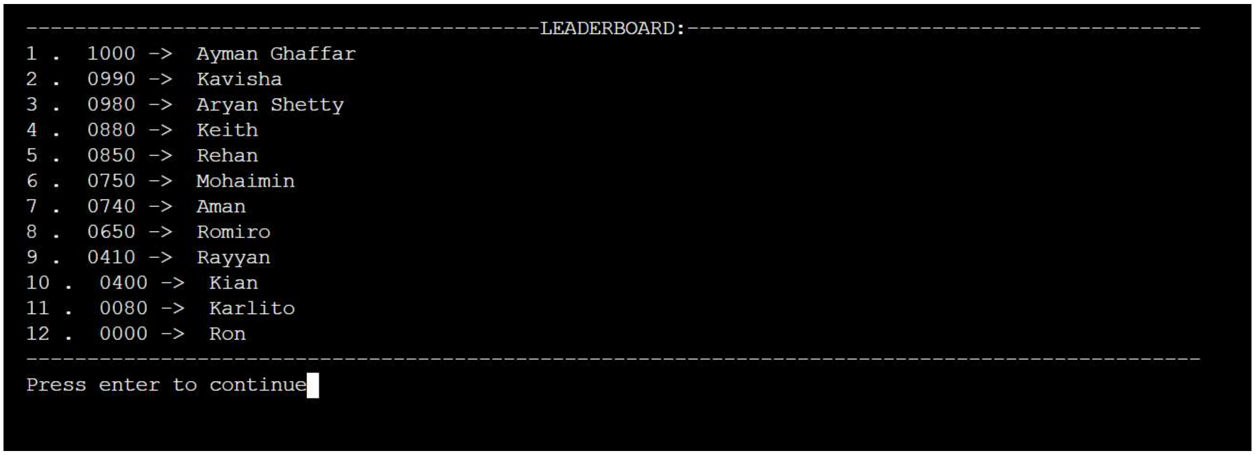
```
--------------------------------------------Round  7 --------------------------------------------

CHOOSE YOUR TOPIC:  1. Geography   2. Science
Select one of the 2 topics: 1

|QUESTION:  Which country is named after the family who bought it and is the only surviving territory of the Holy Roman Empire? |
A. Liechtenstein  B. Luxembourg  C. Andorra  D. San Marino

You have $ 100  with you

Enter Answer: 80,20,0,0

 The Correct answer was  Liechtenstein
 You now have $ 80  to spend
```



```
------------------------------------------------------------GAME OVER------------------------------------------------------------

 Karlito , you finished the game with $ 80  left
Press enter to continue
```



```
------------------------------------------------------------------------------------------------
Press N for a new game
Press X to end game
Press L for to view the current leader board

Enter Choice:L
```



```
------------------------------------------LEADERBOARD:------------------------------------------
1 .  1000 ->  Ayman Ghaffar
2 .  0990 ->  Kavisha
3 .  0980 ->  Aryan Shetty
4 .  0880 ->  Keith
5 .  0850 ->  Rehan
6 .  0750 ->  Mohaimin
7 .  0740 ->  Aman
8 .  0650 ->  Romiro
9 .  0410 ->  Rayyan
10 .  0400 ->  Kian
11 .  0080 ->  Karlito
12 .  0000 ->  Ron
-----------------------------------------------------------------------------------------------
Press enter to continue
```

Conclusion

Advantages of the program:

- The user might be able to access the text file, however since it is encrypted, it will be unreadable
- The code clears the output screen, there making it more user interactive
- There is a big database of 120 questions which could be expanded further
- Due to the use of linked lists for the leaderboard, there's more efficient memory utilization (no need to pre-allocate memory).

Disadvantages of the program:

- The leaderboard can only hold up to 100 names, however the capacity could be increased by increasing the size of the array
- The use of pictures and animations could make the game more user friendly.

How this code is related to the A-level grade:

- The concept of computational thinking is used to design the code, which is a process where several steps, such as abstraction, decomposition, data modelling and algorithm design, are taken in order to reach a solution.
- Shows a simple use of decrypting a cipher text using a key.
- The code shows application of linked lists to a real-life scenario, which producing a leaderboard.
- The concept of exception handling is used to validate the input by the user
- The concept of object-oriented programming by using classes, methods and attributes, and to create objects by instantiating the class.