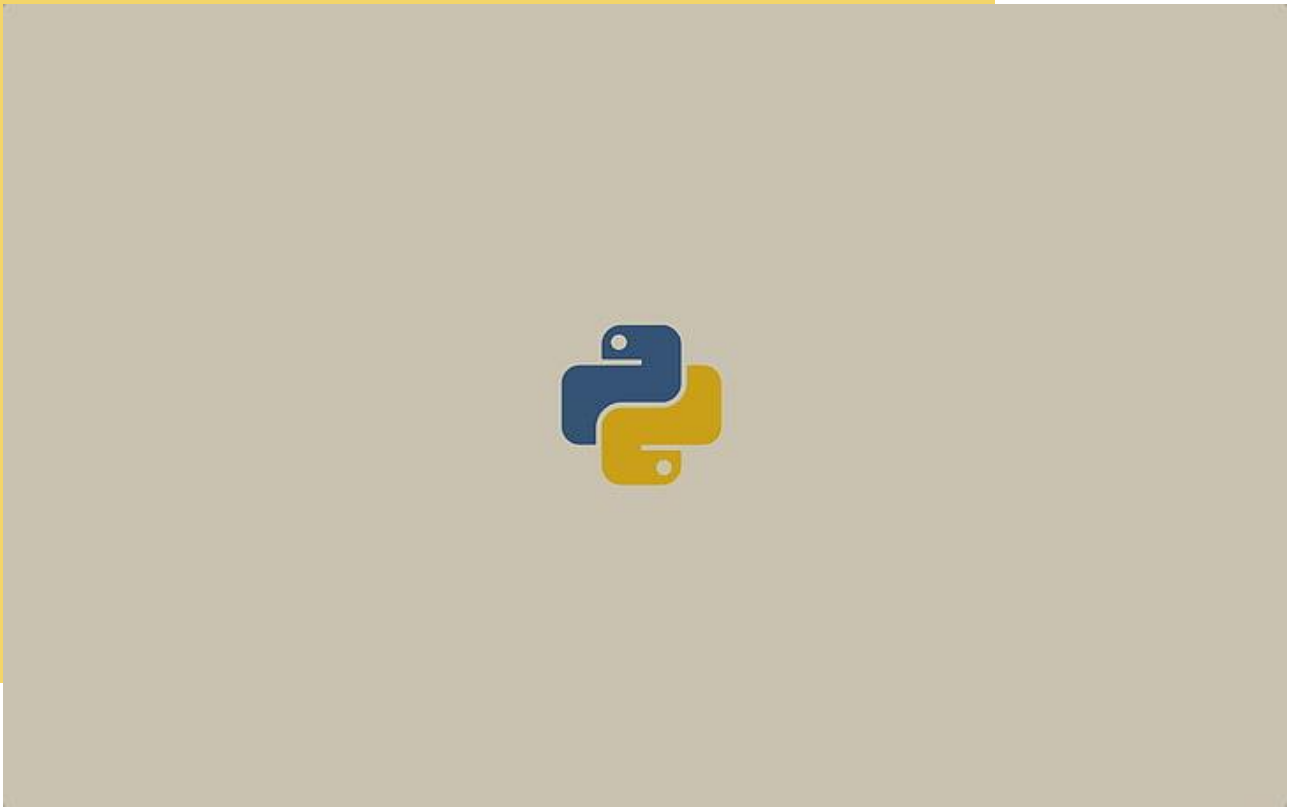

Technical Report JAN_22

JFSEC3.1 “Math Practice” game

Kingston University London

Study Group

WHAT IS PYTHON?

Python is a high-level programming language that supports modules, packages and automatic memory management. Has a syntax close to English and is object-oriented scripting language.

WHY USE PYTHON?

-As Python is written in English-like format; therefore, is easy to read and understand code. In addition, making it easy to learn and attractive for beginners.

-It's a more productive language as it consumes less time understanding and focus on solving the main issue.

-Easy to debug as an interpreted language that executes code line by line. Thus, showing the error with location when faced easing the de-bugging process

-Portability, As Python does not need to apply changes to run on different platforms unlike counter parts as C++

PROJ. USED IDE(S)

During the development of this Project, 2 IDEs where used. The main IDE is “Online Python” as it is easy to access and simple to use. While the secondary IDE was “Microsoft Visual studio code” in order to make use of more professional tools, mainly for high-level de-bugging.

GAME DETAILS

The game “Math practice”, allow participant to test his/her math skills by finding area, perimeter/ volume of **chosen** or **randomly** picked shape from 10 shape choices. Each shape will be provided a randomly generated measure(s) that would enable user to answer 2 mathematical questions given by each shape. A maximum of 2 attempts per question is provided. Each shape would have a total of 3 grade units however, due to smart grading system the grade will be determined based on attempts/ any given help. If user managed to get both answers right first-try full grades will be given, but if user only answers 1 question right first-try a second chance would be given but with choice of getting a hint without hint user get chance to get full 3 marks however if user uses HINT then maximum marks would be 2. (1 mark is given for the first question). Furthermore, If user gets first try user could get 2 marks (without hint, 1 mark each) or 1 mark (with hint, must answer both). At

the end, the right answers would be shown. Then grade is stored, and user will be given the chance to quit or continue playing (user could play infinitely). If user chooses to continue, he/she would be returned to the loop and choose a shape or get a random one. However, If user proceeds to end a summary would be shown including the number of questions attempted, number of right questions, number of wrong/semi-wrong questions and overall grade and Lastly would be given a final message before exiting the code.

In addition, user would be able to views state-of-the-art python script which is easy to read/understand adding to the experience by allowing participants to understand code especially with strong variety of terms, yet simple enough to understand.

PROJ. CODE

A strong variety of functions, variables, loops, lists , … Had been used. At first, “random” and “math” are imported to allow code to perform certain tasks / calculations as in Line 298 where random.randint was used to generate a random square side or Line 414 where math.pi was used to get volume of Sphere. User, is given a welcoming message by a print function and welcomed by name (after input) Line 13-14 . “#” Are used to outline each area of project as in Line 11 and may also be used to store “testing functions” that was used while development to ensure code is working/ a condition is met as Line 179 where it checks that all given sides of triangle obey isosceles theorem which validates that these sides could make a triangle while random range values are given respectively to obey the theorem. The proj. is put in main loop in following sequence (example):

```
16  def game_choice():
52  #Solid Rectangle
53  def sld_rktngl():
169 #Triangle
170 def tri():
291 #Square
292 def sqr():
406 #Sphere
407 def sphyr():
521 #Rectangle
522 def rktngl():
```

Where in game_choice() a shape is chosen and hence will excute relative function. After question ends if user decides to continue user will forwarded to game_choice() to continue LOOP. In execution a strong use of LOOPs as for / while had been achieved as in Line 20 and Line 283 respectively. In addition to strong use of pseudocode as IF ELSE , for example in Line 28 and Line 1207 . Additionally use of of code such as .lower , global , \n, .startswith() …. +=1

Report Summary

Word count: 729