1 High-level programming languages usually have libraries of commonly used routines. These include random number generators.

Task 1.1

Write program code to generate 1000 random integers in the range 1 to 20.
The program will:

- Maintain a count of how many times each number is produced
- Print out a frequency table.

Example output:

Integer	Frequency
1:	54
2:	48
3:	52
4:	43
5:	48
6:	51
7:	41
8:	48
9:	53
10:	51
11:	45
12:	54
13:	44
14:	40
15:	54
16:	59
17:	47
18:	49
19:	66
20:	53

Evidence 1
Your program code.
Screenshot of the program output. [7]

Random numbers generated by computers are usually referred to as pseudo-random numbers because they are generated by executing program code.

One criterion of a good pseudo-random number generator is that every number in the range has an equal chance of being generated. This means if 200 numbers are generated in the range 1 to 10, the expected frequency value of every number in this range is 20.

The program code is to be amended to check how well the given pseudo-random number generator meets this requirement.

Task 1.2

Amend your program code to:

- Calculate the expected frequency
- Output this expected frequency
- Output the difference between the actual and the expected frequency for each number in the range as a third column of the frequency table.

Evidence 2

Your program code.
Screenshot of the program output. [5]