

Given the two functions below create the codes that will perform the following task:

$$f(x) = x - 2$$

$$g(x) = x + 2$$

Code:

```
midterm3.py > ...
1  import random
2
3  # Define the functions f(x) and g(x)
4  def f(x):
5      return x - 2
6
7  def g(x):
8      return x + 2
9
10 # Step 1: Generate 10 random integers from 0 to 10
11 inputs = [random.randint(0, 10) for _ in range(10)]
12
13 # Step 2: Calculate outputs of f(x) and g(x) for each input
14 output_f = [f(x) for x in inputs]
15 output_g = [g(x) for x in inputs]
16
17 # Step 3: Calculate the product of f(x) and g(x) for each input
18 output_multiplication = [f(x) * g(x) for x in inputs]
19
20 # Step 4: Calculate the composition of g o f for each input
21 output_composition = [g(f(x)) for x in inputs]
22
23 # Display results
24 print("Input:", inputs)
25 print("OutputF:", output_f)
26 print("OutputG:", output_g)
27 print("FmultiplicationG:", output_multiplication)
28 print("GcompositionF:", output_composition)
```

- 1.) Generate randomly 10 integers from 0 to 10. Place these in “Input” as the input holder.

Input: [7, 5, 1, 7, 5, 3, 8, 10, 9, 7]

- 2.) Use the inputs in no.1 to generate the output of f(x), place it in “OutputF”. Use the same inputs for g(x) and place it in “OutputG”.

OutputF: [5, 3, -1, 5, 3, 1, 6, 8, 7, 5]
OutputG: [9, 7, 3, 9, 7, 5, 10, 12, 11, 9]

3.) Find the output of the product of $(f \circ g)(x)$, and place it in "FmultiplicationG".

FmultiplicationG: [45, 21, -3, 45, 21, 5, 60, 96, 77, 45]

4.) Find the output of the composition of $(g \circ f)(x)$, and place it in "GcompositionF".

GcompositionF: [7, 5, 1, 7, 5, 3, 8, 10, 9, 7]