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BSCS-2B
CS223 - Discrete Structures

Laboratory 2

1. Generate randomly 20 integers from -10 to 10. Place these in "Input" as the input holder.

```
Input  [9, -9, 6, 1, 0, 3, 4, 4, 1, 10, -4, 10, 1, -2, -4, -6, -10, -4, 8, 2]
```

2. Use the inputs in no.1 to generate the output of f(x), place it in "F". Use the same inputs for h(x) and place it in "H".

```
F  [1295, 1295, 575, 15, -1, 143, 255, 255, 15, 1599, 255, 1599, 15, 63, 255, 575, 1599,
    255, 1023, 63]
```

```
H  [17.25, -18.75, 11.25, 1.25, -0.75, 5.25, 7.25, 7.25, 1.25, 19.25, -8.75, 19.25, 1.25
   , -4.75, -8.75, -12.75, -20.75, -8.75, 15.25, 3.25]
```

3. Find the output of the sum of f(x) and h(x), and place it in "F+H".

```
F+H  [1312.25, 1276.25, 586.25, 16.25, -1.75, 148.25, 262.25, 262.25, 16.25, 1618.25,
     246.25, 1618.25, 16.25, 58.25, 246.25, 562.25, 1578.25, 246.25, 1038.25, 66.25]
```

4. Find the output of the difference of f(x) and h(x) and place it in "F-H".

```
F-H  [1277.75, 1313.75, 563.75, 13.75, -0.25, 137.75, 247.75, 247.75, 13.75, 1579.75,
     263.75, 1579.75, 13.75, 67.75, 263.75, 587.75, 1619.75, 263.75, 1007.75, 59.75]
```

5. Find the output of the product of f(x) and h(x) and place it in "F*H".

```
F*H  [22338.75, -24281.25, 6468.75, 18.75, 0.75, 750.75, 1848.75, 1848.75, 18.75, 30780
     .75, -2231.25, 30780.75, 18.75, -299.25, -2231.25, -7331.25, -33179.25, -2231.25,
     15600.75, 204.75]
```

6. Find the output of the quotient of f(x) and h(x) and place it in "F/H".

```
F/H  [75.07246376811594, -69.06666666666666, 51.111111111111114, 12.0, 1
     .3333333333333333, 27.238095238095237, 35.172413793103445, 35.172413793103445, 12.0,
     83.06493506493507, -29.142857142857142, 83.06493506493507, 12.0, -13.263157894736842
     , -29.142857142857142, -45.09803921568628, -77.06024096385542, -29.142857142857142,
     67.08196721311475, 19.384615384615383]
```

7. Find the output of the composition of (f o g) (x0, and place it in "F(G)".

```
F(H)  [4760.0, 5624.0, 2024.0, 24.0, 8.0, 440.0, 840.0, 840.0, 24.0, 5928.0, 1224.0,
      5928.0, 24.0, 360.0, 1224.0, 2600.0, 6888.0, 1224.0, 3720.0, 168.0]
```

8. Find the output of the composition of (g o f) (x0, and place it in "G(F)".

```
H(F)  [2589.25, 2589.25, 1149.25, 29.25, -2.75, 285.25, 509.25, 509.25, 29.25, 3197.25,
      509.25, 3197.25, 29.25, 125.25, 509.25, 1149.25, 3197.25, 509.25, 2045.25, 125.25]
```

9. Print the input and output as ordered pairs of f^−1(x), and name it "Inverse of f".

```
Inverse of f [(1295, 9), (1295, -9), (575, 6), (15, 1), (-1, 0), (143, 3), (255, 4),
             (255, 4), (15, 1), (1599, 10), (255, -4), (1599, 10), (15, 1), (63, -2), (255, -4),
             (575, -6), (1599, -10), (255, -4), (1023, 8), (63, 2)]
```

10. Print the input and output as ordered pairs of g^−1(x), and name it "Inverse of g".

```
Inverse of g [(17.25, 9), (-18.75, -9), (11.25, 6), (1.25, 1), (-0.75, 0), (5.25, 3), (7
    .25, 4), (7.25, 4), (1.25, 1), (19.25, 10), (-8.75, -4), (19.25, 10), (1.25, 1), (-4
    .75, -2), (-8.75, -4), (-12.75, -6), (-20.75, -10), (-8.75, -4), (15.25, 8), (3.25,
    2)]
```

Code:

```python
1   import random
2
3   input = []
4   what = []
5   when = []
6   where = []
7   who = []
8   why = []
9   how = []
10  wow = []
11  omg = []
12  lol = []
13  lmao = []
14
15  for i in range(20):
16      l = random.randint(-10, 10)
17      input.append(l)
18
19      f = (4 * l) ** 2 - 1
20      what.append(f)
21
22      h = 2 * l - 3/4
23      when.append(h)
24
25      where.append(f+h)
26      who.append(f-h)
27      why.append(f*h)
28      how.append(f/h)
29
30      foh = (4 * h) ** 2 - 1
31      wow.append(foh)
32
33      hof = 2 * f - 3/4
34      omg.append(hof)
35
36      fi = (f,l)
37      lol.append(fi)
38
39      hi = (h, l)
40      lmao.append(hi)
41
42  print("Input ", input)
43  print("F ", what)
44  print("H ", when)
45  print("F+H ", where)
46  print("F-H ", who)
47  print("F*H ", why)
48  print("F/H ", how)
49  print("F(H) ", wow)
50  print("H(F) ", omg)
51  print("Inverse of f", lol)
52  print("Inverse of g", lmao)
```