

rogram Structures & Algorithms

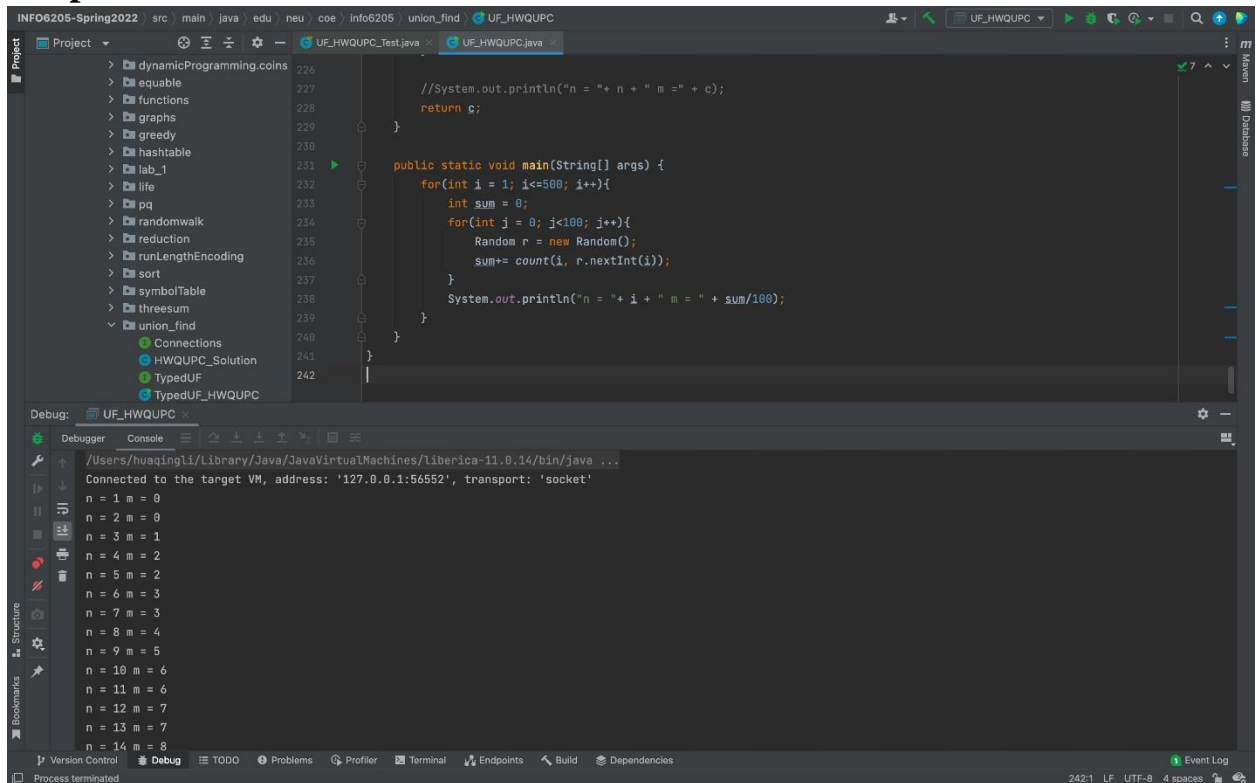
Spring 2022

Assignment No. 3

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- Task
WQUPC
- Output screenshot



The screenshot displays an IDE with a project named 'INFO6205-Spring2022'. The left sidebar shows a file tree with various folders like 'dynamicProgramming.coins', 'equable', 'functions', 'graphs', 'greedy', 'hashtable', 'lab_1', 'life', 'pq', 'randomwalk', 'reduction', 'runLengthEncoding', 'sort', 'symbolTable', 'threesum', and 'union_find'. The main editor shows the file 'UF_HWQUPC.java' with the following code:

```
//System.out.println("n = " + n + " m = " + c);
return c;
}

public static void main(String[] args) {
    for(int i = 1; i<=500; i++){
        int sum = 0;
        for(int j = 0; j<100; j++){
            Random r = new Random();
            sum+= count(i, r.nextInt(i));
        }
        System.out.println("n = " + i + " m = " + sum/100);
    }
}
```

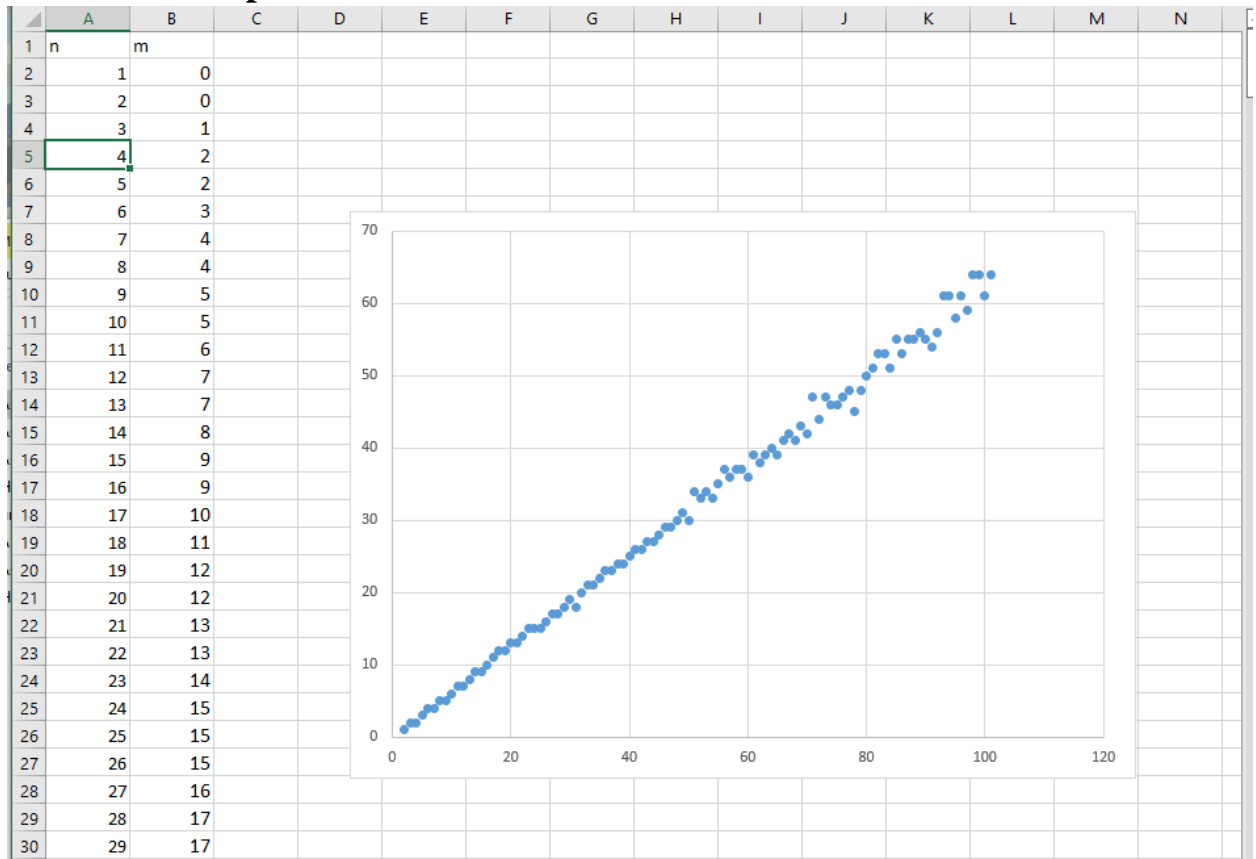
The bottom panel shows the 'Debug' console with the following output:

```
/Users/huajiel/Library/Java/JavaVirtualMachines/liberica-11.0.14/bin/java ...
Connected to the target VM, address: '127.0.0.1:56552', transport: 'socket'
n = 1 m = 0
n = 2 m = 0
n = 3 m = 1
n = 4 m = 2
n = 5 m = 2
n = 6 m = 3
n = 7 m = 3
n = 8 m = 4
n = 9 m = 5
n = 10 m = 6
n = 11 m = 6
n = 12 m = 7
n = 13 m = 7
n = 14 m = 8
```

- Relationship Conclusion

$$M = C * n \text{ (} C = \text{Constant)}$$

• Evidence / Graph



• Unit tests result

```
INFO6205-Spring2022 - UF_HWQUPC_Test.java
INFO6205-Spring2022 [INFO6205] ~/D...
Project
  INFO6205-Spring2022 [INFO6205] ~/D...
    .idea
    logs
    src
    main
      java
        edu.neu.coe.info6205
          balsearchtree
          bqs
          codelength
          coupling
          dynamicProgramming.coins
UF_HWQUPC_Test
1  //...
2
3 package edu.neu.coe.info6205.union_find;
4
5
6
7 import ...
8
9
10
11
12 public class UF_HWQUPC_Test {
13
14
15 @Test
16 public void testToString() {
17     Connections h = new UF_HWQUPC( n: 2);
18 }
```

Debug: UF_HWQUPC_Test

Tests passed: 13 of 13 tests - 3 ms

UF_HWQUPC_Test (edu.neu.coe 3 ms)

- testIsConnected01 1ms
- testIsConnected02 1ms
- testIsConnected03 1ms
- testFind0 0ms
- testFind1 0ms
- testFind2 0ms
- testFind3 0ms
- testFind4 0ms
- testFind5 0ms
- testToString 0ms
- testConnect01 0ms
- testConnect02 0ms
- testConnect03 0ms

Process finished with exit code 0

Connected to the target VM, address: '127.0.0.1:55786', transport: 'socket'

Disconnected from the target VM, address: '127.0.0.1:55786', transport: 'socket'