

INFO 6205

Program Structures & Algorithms

Fall 2020

Assignment No 3

- **Task**
- **Output** (few outputs to prove relationship)

Make the n to be $i * i * 100$ and $i * i * 1000$:

```
//int n = i * i * 100;  
int n = i * i * 1000;
```

And we got the outputs:



```
UF_Assign x  
"C:\Program Files\Java\jdk-14.0.1\bin\java.exe" -Didea.launcher.port=519  
257.925  
1318.48  
3387.36  
6360.785  
10376.86  
15942.435  
22112.14  
29687.915  
38139.905  
49032.205  
  
Process finished with exit code 0
```



```
"C:\Program Files\Java\jdk-14.0.1\bin\java.exe" -Didea.launcher.port=3749.59
3749.59
17696.455
43912.38
82422.295
133778.685
200531.22
280498.64
368279.22
482204.31
609650.85

Process finished with exit code 0
```

And then I put these values into the Excel:

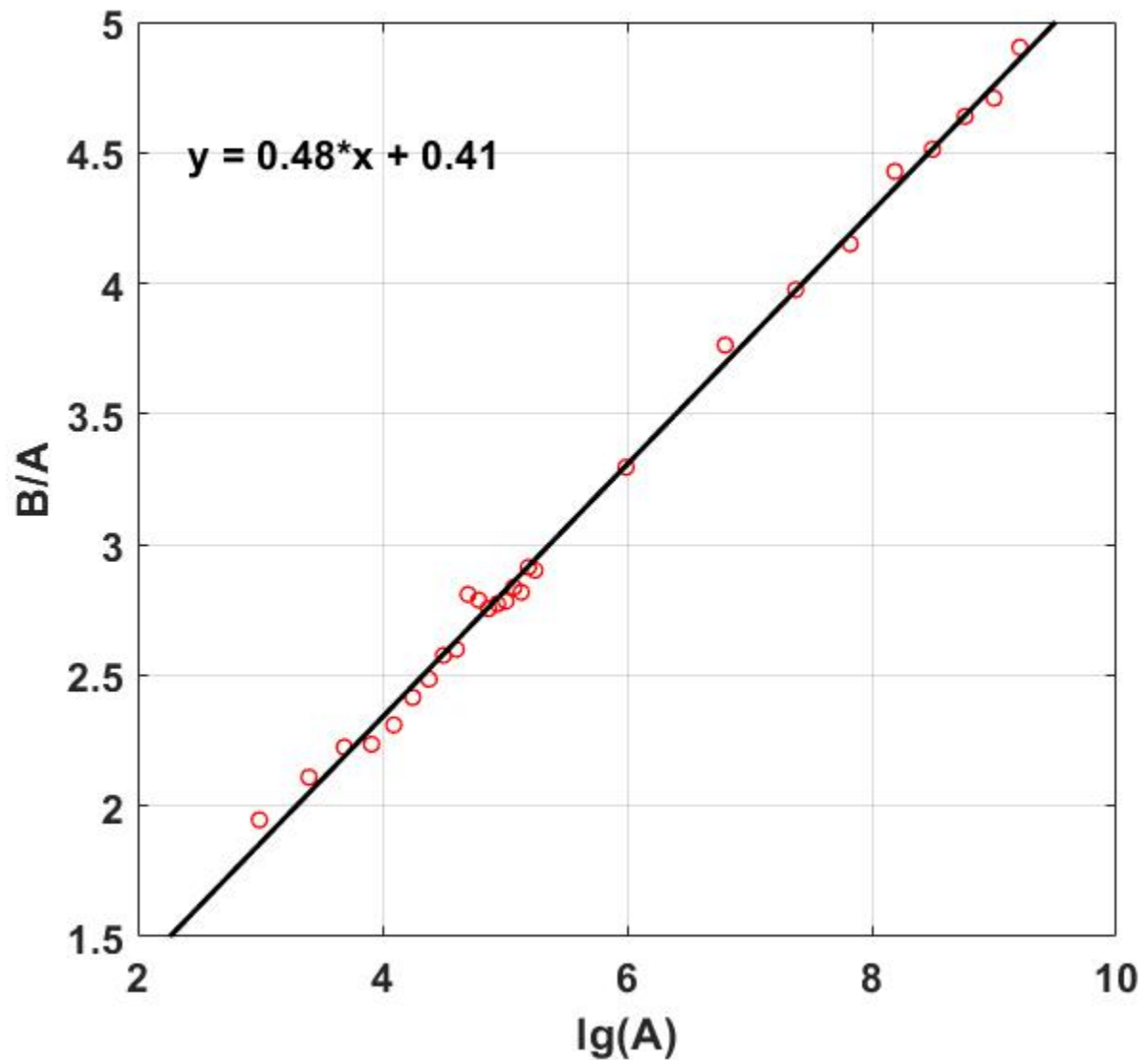
| A | B |
|--------|----------|
| 100 | 257.925 |
| 400 | 1318.48 |
| 900 | 3387.36 |
| 1600 | 6360.785 |
| 2500 | 10376.86 |
| 3600 | 15942.44 |
| 4900 | 22112.14 |
| 6400 | 29687.92 |
| 8100 | 38139.91 |
| 10000 | 49032.21 |
| 1000 | 3749.59 |
| 4000 | 17696.46 |
| 9000 | 43912.38 |
| 16000 | 82422.3 |
| 25000 | 133778.7 |
| 36000 | 200531.2 |
| 49000 | 280498.6 |
| 64000 | 368279.2 |
| 81000 | 482204.3 |
| 100000 | 609650.9 |

- **Relationship conclusion**

I think the relationship is: $m \approx 0.5 * n * (\log(n) + 1)$

- **Evidence to support relationship** (screen shot and/or graph and/or spreadsheet)

We make the $y = m / n$, and $x = \log(n)$, then we get:



So the conclusion should be correct.

- **Screenshot of Unit test passing**

Dayu Jia (NUID: 001569081)

