**Assignment # 4**

**Q.3 Heap/Stack diagram**

←Diagram at this point

|  |  |
| --- | --- |
| **Heap** | **Stack** |
| Stores objects. Example, (int a, int b) | Stores variables. Example, r, i, n, x |
| Rational 🡪division of 2 int. First number is int and second is denominator. Its more like (a/b) |  |
| Line 1-a will memory allocate location for (1,2) |  |
| raisToPower method is called, will allocate memory locations for subroutine raisToPower(r,3)…. That is (1,1), (1,2),(1,4), (1,8) |  |

1,2

100

Garbage

1,1

i

1,2

n

1,4

x

1,8

r

**Indicate which values in the heap are garbage at this point in the calculation.**

Once we get the final results (1,8) we will not need (1,1), (1,2),(1,4) because they are temporary objects. So, (1,1), (1,2),(1,4) are garbage.

**Q.4 Tracing method execution**

For the program below, show what output is produced by the program when it runs.

witch: x = 1, y = 1

witch: x = 10, y = 0

witch: x = 101, y = 1

witch: x = 1011, y = 1

ghost: x = 13, y = 1011