Activity 3: Recursion

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Count to One:

```
Operation 1: Count to One
Enter an integer: 99
n is 99
n is odd - add 1
n is 100
n is even - divide by 2
n is 50
n is even - divide by 2
n is 25
n is odd - add 1
n is 26
n is even - divide by 2
n is 13
n is odd - add 1
n is 14
n is even - divide by 2
n is 7
n is odd - add 1
n is 8
n is even - divide by 2
n is 4
n is even - divide by 2
n is 2
n is even - divide by 2
n is 1
```

Factorial:

```
Operation 2: Factorial
Enter an integer: 8
n is 8
n is 7
n is 6
n is 5
n is 4
n is 3
n is 2
n is 1
8! = 40320
```

GCD:

```
Operation 3: Greatest Common Denominator
Enter an integer: 99
Enter an integer: 55
Remainder is 44
Remainder is 11
Remainder is 0
The GCD of 99 and 55 is 11
```

Knight’s Tour:

5x5 board starting at (1,1)

```
Operation 4: Knight's Tour
Enter a board size: 5
Enter a starting row: 1
Enter a starting column: 1
1 14 19 8 25
6 9 2 13 18
15 20 7 24 3
10 5 22 17 12
21 16 11 4 23
Total attempted moves: 74301
```

6x6 board starting at (1,2)
This took a very long time and rolled over the total move counter

```
Operation 4: Knight's Tour
Enter a board size: 6
Enter a starting row: 1
Enter a starting column: 2
36 1 10 25 28 3
17 24 35 2 11 26
34 9 18 27 4 29
23 16 5 30 19 12
8 33 14 21 6 31
15 22 7 32 13 20
Total attempted moves: -1148787972
```

6x6 board starting at (1,2) using Warnsdorff’s algorithm
Much faster and took exactly boardSize * boardSize attempts

```
Operation 4: Knight's Tour
Enter a board size: 6
Enter a starting row: 1
Enter a starting column: 2
12 1 28 21 10 7
27 20 11 8 29 22
2 13 26 33 6 9
19 34 17 30 23 32
14 3 36 25 16 5
35 18 15 4 31 24
Total attempted moves: 36
```

8x8 board starting at (1,1) using Warnsdorff’s algorithm

```
1 4 57 20 47 6 49 22
34 19 2 5 58 21 46 7
3 56 35 60 37 48 23 50
18 33 38 55 52 59 8 45
39 14 53 36 61 44 51 24
32 17 40 43 54 27 62 9
13 42 15 30 11 64 25 28
16 31 12 41 26 29 10 63
Total attempted moves: 64
```