Recursion Lab

1) Trace the following code. (Draw a table with the appropriate variables and fields.)

```
int mystery (int x) {
  if (x/10 < 10) {
    return x;
  }
  else {
    return x%10 + mystery(x/10);
  }
}

println(mystery(123456));
```

2) Trace the following code. (Draw a table with the appropriate variables and fields.)

```
int mystery2 (int num) {
  if (num==1) {
    return num;
  }
  else {
    return (num/2) * mystery2(num-1);
  }
}

println(mystery2(4));
```

3) Write a recursive function `int power(int x, int y)` that takes two integer parameters `x` and `y`. The function should return the y^{th} power of `x`. Assume that `y` is nonnegative.

4) Write a recursive function `void rev(int[] a, int start, int end)` that takes an integer array `a`, a starting index `start` and an ending index `end` and reverses the portion of the array between the indices. For example, if array `a` is declared and initialized as follows:

```
int[] a = {1, 2, 3, 4, 5};
```

then the call `rev(a, 0, a.length-1)` will result in the contents of `a` completely reversed.