CMPE 242
Spring 2021
Hands-On Activity 4

- Find the running time of the following code fragments.
- Give your answers in both *Big-O* and ~ notations.

ITERATIVE ALGORITHMS:

1.	`k = 1;`
	`for (i=1; i<n; i++)`
	`  k++;`
		Answer: _____

2.	`if (x < 3)`
	`  k++;`
	`else {`
	`  k = 1;`
	`  for (i=1; i<n; i++)`
	`  k++;`
	`}`
		Answer: _____

3.	`k = 1;`
	`for (i=1; i < n; i++)`
	`  for (j=1; j < m; j++)`
	`  k++;`
		Answer: _____

4.	`for (i = 1; i < n * n; i++)` `  i++;`	Answer: _____

5.	`k=1;`
	`for (i = 0; i < n; i++)`
	`  for (j = i + 1; j < n; j++)`
	`  k++;`
		Answer: _____

6.	`i = 0;`
	`while (i < n * n * n)`
	`  i = i + 2 * n;`
		Answer: _____

7.	`i = 0;`
	`while (i < n * n)`
	`  i = i + n / 4;`
		Answer: _____

8.	`for (i = 1; i < n; i = 3 * i) {`
	`  j = 1;`
	`  while (j < n)`
	`  j = j + 1;`
	`}`
		Answer: _____

9.	`for (i = 1; i < n; i++) {`
	`  j = 1;`
	`  while (j < 10000)`
	`  j = j + 1;`
	`}`
		Answer: _____

RECURSIVE ALGORITHMS

1.	`int factorial( int n)`
	`{`
	`  if (n == 0)`
	`  return 1;`
	`  else`
	`  return n * factorial(n-1);`
	`}`
		Answer: _____

2.	`void hanoi( int n, char source,`
	`  char dest, char space)`
	`{`
	`  if (n > 0) {`
	`  hanoi( n-1, source, spare, dest);`
	`  moveDisk( source, dest);`
	`  hanoi( n-1, spare, dest, source);`
	`  }`
	`}`
		Answer: _____

3.	`int binarySearch ( int[] arr, int x,`
	`  int low, int high)`
	`{`
	`  if (low > high)`
	`  return -1;`
	`  int mid = (low + high) / 2;`
	`  if (arr[mid] == x)`
	`  return mid;`
	`  else if (arr[mid] > x)`
	`  return binarySearch(`
	`  arr, x, low, mid-1);`
	`  else`
	`  return binarySearch(`
	`  arr, x, mid+1, high);`
	`}`
		Answer: _____

4.	`void f ( int n)`
	`{`
	`  if (n == 1)`
	`  System.out.println("Tick");`
	`  if ( n > 1) {`
	`  f( n/2);`
	`  f( n/2);`
	`  }`
	`}`
		Answer: _____