CSC 2259 Session 2 Worksheet 01/27/2020	John Brasher SI Sessions: Sundays & Mondays @ 6:30 – 8:00 PM [PFT 1212] Office Hours: Mondays & Fridays 12:30 – 2:30 PM

1) What is a set? What is a subset?

2) State the Binomial Theorem.

3) A snowball stand lets you choose at most 3 flavors for each snowball, and the menu displays that there are 11 different flavors. How many different combinations of snowballs can you make?

4) What is the total #(lines from an m-subset to all connecting (m-1)-subsets)?

5) Derive an equation connecting C(n,m) with C(n,m-1). Do you notice anything about the result?

6) **[a]** What is the following program doing, where n is already defined?

```
int[] c = new int[n + 1];

c[0] = 1;
c[1] = n;

for (int m = 2; m <= n; m++)
    c[m] = c[m - 1] * (n – m + 1) / m;
```

[b] What is the total #(operations) in the loop-body and those outside of the loop, where n is already defined?

7) **[a]** What is the following program doing, where n is already defined?

```
int[] c = new int[n + 1];

c[0] = 1;
c[1] = n;

for (int m = 2; m <= n; m++) {

    int top = n, bottom = m;

    for (int i = 2; i <= m; i++) {

            top *= (n - i + 1);
            bottom *= (m - i + 1);

    }

    c[m] = top / bottom;

}
```

[b] Can we make the following code given in class more efficient? If so, how?

8) For the following code, determine if the modifications below will change the value of result if a and b are integers, where a != 0. If so, why?

```
int result = (a + b) * (b – a) / a;
```

[a] `(b – a) * (a + b) / a;`

[b] `(a + b) / a * (b – a);`

9) [a] Show the performance of the code for different lengths of the arrays nums1 and nums2.

```
int[] longestArray = nums1;

if (nums2.length > longestArray.length)
    longestArray = nums2;
```

[b] Can we improve the code? If we can, how?