CSCI 2110
Data Structures and Algorithms
Extra Practice on O Notation

1. Arrange the following in increasing orders of complexity

$n, n^2, n^3, 2^n, \sqrt{n}, n\log n^n$

2. An algorithm with complexity $O(n^2)$ takes 5 ms to process 50 data items.

a) Estimate how long it will take to process 5000 data items.

b) Estimate how much data can be processed in 500 ms.

3. Derive the big O complexity of each of the following code segments:

Code Segment 1:

```
for (int i = 1; i <= n; i++)
      for (int j = 1; j <=n; j++)
            sum++;
```

Code Segment 2:

```
for (int i = 1; i <= n; i++)
      for (int j = 1; j <=n^2; j++)
            sum++;
```

Code Segment 3:

```
if (x==10)

      for (int i = 1; i <= n; i++)
            sum++;
else
{
      for(int i=1;i<=n;i++)
            for(int j=1; j<=n;j=2*j)
                  for(int k=1;k<=1000;k++)
                        sum++;
}
```