Assignment # 1

Time Complexity Analysis

Submission Dead Line: Monday 7/9/2015 Before Class

LATE SUBMISSION WILL NOT BE ACCEPTED
THE ASSIGNMENT SHOULD BE HAND WRITTEN NOT TYPED.

Question 1:

Do exercise questions 3, 8 and 9 from book Chapter 1 Basic Concepts.

Question 1:

Do exercise 4(d) for question numbers 4, 5, 6 from book Chapter 1 Basic Concepts.

Question 2:

Assuming that each operation takes a single unit of time to execute calculate the time complexity function T(n) and Big-O for the following program fragments:

1:

```
for (i=1;i<=n;++i)
{     cout << i;
      Sum=0;
      for (j=1;j<=i;++j)
      {
            Sum++;
            cout << i;
      }
      cout << Sum;
}
```

2:

```
for (i=1;i<n;i=i*4)
{
      cout << i;
      for (j=0;j<n;j=j+2)
      {
            cout << j;
            sum++
      }
      cout << sum;
}
```

3:

```
sum = 0;
for (i=1;i<=n;i=i*2)
{
      cout << i;
      cout << sum;
      for (j=1;j<=i;++j)
      {
            cout << j;
            cout << "*";
            sum++;
      }
      sum =0;
}
```

4:

```
for (i=0;i<n;i=i+3)
{
      cout << i;
      for (j=1;j<n;j=j*3)
      {
            cout << j;
            sum++
      }
      cout << sum;
}
```

5:

```
for (i=1;i<=n;++i)
{     cout << i;
      Sum=0;
      for (j=1;j<=i;++j)
      {
            for (k=1;k<=j;++k)
            {

                  Sum++;
                  cout << i;
            }
      }
      cout << Sum;
}
```

6:

```
for (i=1;i<=10;++i)
{    cout << i;
     Sum=0;
}
```

7: Binary Search

```
high = N-1;
low = 0;
index = -1;
while(high >= low)
{
     mid = (high + low)/2;
     if (key == a[mid]) {
          index = mid; break;
     }
     else if (key > a[mid])
          low = mid + 1;
     else high = mid – 1;
}
```