Chapter 19 Exercise

Write in a word file or text file

1. What is the Big O value for a sequential search on an unordered list?

2. What requirement must we impose on a list before we can apply a binary search to it?

3. What is the time complexity order of a binary search on an ordered list?

4. Suppose an algorithm with a Big O value of O(n) has a runtime of 20 sec for n = 5000. What will be the runtime for n = 1000?

5.
```
for(j = 0;j < n + 5; j++)
{
        …some code…
}
```
What is the Big O value?

6.
```
for(j = 0;j < n + 5; j++)
        for(k = 0; k < n; k+=8)
                for(z = 0; z <= (n*n); z++)
                {   …some code…   }
```
What is the Big O value?

7.
```
for(j = 0;j < n - 5; j++)
{
        for(k = 0; k < 7; k++)
        {   …some code…   }
}
```
What is the Big O value?

8.
```
for(j = 2; j < n + 5; j*=7)
{
        …some code…
}
```
What is the Big O value?

9. There are two types of complexity analysis. What two things can be analyzed?

10. Which of these two types does Big O address?

11. Suppose a time complexity analysis yields $5000n^2 + (1/1000)\ n^3 + n - 2$. What would be the Big O value?

12. Will a O(n) algorithm generally always win in a time-race over a $O(n^3)$ algorithm?

13. Which is generally the fastest for large n, O(log n) or $O(2^n)$?

14. An algorithm has a time complexity of the order 2^n. How many times more slowly would this algorithm run when n= 200, as compared to n = 100?

15.
```
for(j = 0 ;j < n - 5; j++)
{
        for(k = 0; k < n; k++)
        {   …some code…   }
}
```
What is the Big O value?

16.
```
for(j = 0 ;j < n; j++)
{
        for(k = j; k < n; k++)
        {   …some code…   }
}
```
What is the Big O value?

