XMind

Writing Test

Name_____

Date _____

1. What's the time complexity of the following code, and why?

```
var a = 0;
for (var i = 0; i < N; i +) {
    for (var j = N; j > i; j -)
        { a = a + i + j;
    }
}
```

2. Tell the differences between a byte, a character, and a string. Tell the differences between Unicode, UTF-8, UTF-16, GB2312, and GB18030.

3. What are the mobile and desktop operating systems you use everyday? What applications do you use frequently? Can you name a few of them and tell how they can be improved or have bugs fixed?

4. What is the difference between Factory and Builder design patterns? What is the difference between Adapter and Decorator design patterns? Give an example for each above pattern.

5. Given a number of rectangles defined by their width, height, and location (x, y) of their top-left corners, how can we insert a new rectangle(with a fixed size) as close as possible to a desired target location, without making it intersect with any existing rectangles?