COP 3804
Intermediate Java Programming

Examination 4

Name: ___________________________

SAMPLE

This exam has 3 additional pages. Please answer each question on the page on which it is asked. If you need more space than has been provided, you are doing something wrong.
1. [30 pts] Answer the following questions based on this code:

```java
public static int foo( int x )
{
    if( x <= 0 )
        return 1;
    else
        return foo( x - 1 ) * 2;
}
```

(a) What is returned by the call `foo( 0 )`?
(b) What is returned by the call `foo( 1 )`?
(c) What is returned by the call `foo( 2 )`?
(d) What is returned by the call `foo( 5 )`?
(e) In the code above, circle the base case.
2. [35 pts] The binomial coefficients are defined as follows

\[ B(n, k) = \begin{cases} 
1 & \text{if } k = 0 \text{ or } k = N \\
B(n - 1, k - 1) + B(n - 1, k) & \text{otherwise}
\end{cases} \]

Implement this function to compute the binomial coefficient:

```java
// 0 <= k <= n
public static long binomial( int n, int k )
{
```
3. [35 pts] Method `reverseString` returns the reversal of a string. For instance, the following table shows the result of some calls to `reverseString`

```java
str reverseString( str )
== ====================
"" ""
"abc" "cba"
"xabc" "cbax"
```

Implement `reverseString` recursively.

```java
public static String reverseString( String str )
{
```