

LAB #12

D'BUGGING

Ted Pawlicki

October 25-26, 2004

This lab should be completed during the scheduled lab sessions. In order to complete this lab you must demonstrate programs to your lab TA. The technical knowledge on how to accomplish these tasks is found in the assigned reading or the lecture notes, but the lab TA will help as well.

1. Write a JAVA application that prompts the user to enter three integer numbers: ("a", "b", and "c"). Use the console for input. Your program should calculate and print the value of a^b (a raised to the power b). Your program should also print out the binary representation of c . Use the methods below to perform the computations.

```
public static long power(int a, int n) {
    long r = 1; int b = a; int i = n ;
    while (i>0) {
        if (i%2 == 0) {
            b = b * b;
            i = i / 2;
        }
        else {
            r = r * b;
            i--;
        }
    }
    return r;
}
```

```
public static String int2bin(int n) {
    String rstring = "";
    boolean negval;
    if (n < 0) {
        negval = true;
        n *= -1;
    } else {
        negval = false;
    }
    if (n == 0) rstring = "0";
    while (n>0) {
```

```

        if (n%2 == 0) {
            rstring = "0" + rstring;
        }
        else {
            rstring = "1" + rstring;
        }
        n /= 2;
    }
    return (negval ? "-" : "") + rstring;
}

```

2. Use the BlueJ debugger to set breakpoints in at the "if" statements in the loops. Using the debugger, build a table of showing how the local variables in the methods change each time you go around the loop until completion.
3. Note: Your lab document must contain two tables. One shows the change in the local variables for each method, above. In order to test the power method, choose a random value of "a" between 3 and 11, choose a random "b" between 10 and 20. For the int2bin method, choose a random number between 10000 and 20000. No two students should chose the same numbers.
4. Cut and paste your source code and screen shots of your debugging window into your lab document and hand it in. Included your two tables in the lab document. Be sure to demo your running code to your TA so that the TA has a record of "checking you off" as having done this lab.

NOTE: Electronic hand in should be working at this point. Submit your lab work through the homework drop box in WebCT. However, if you encounter any problems, revert to paper based hand in.