COMP 110 Midterm

UNC Honor Pledge: I certify that no unauthorized assistance has been received or given in the completion of this work

Signature ______________________________

You may NOT use any course materials in completing this test.

The test consists of three sections: first, a section of short answer questions; second, a section requiring you to trace a short piece of code and write the output produced by the code; finally, a section requiring you to write code. The second and third sections each provide four questions of different point values. You can choose THREE questions from section two, and TWO questions from section three to be graded. It is possible to attempt greater than or fewer than 100 points, however your final grade will be calculated out of 100 points. Point values are given for each question.

Illegible answers will not receive credit.
Part 1. (40 points) Answer ALL questions

1.) (2 points) What is the value of var?

   double var = (3 / 2) * 2.0;

2.) (4 points) List 4 primitive types.

3.) (3 points) Declare a variable to hold the amount of money you have saved for spring break and initialize it to 150.75. Name your Java variable so any programmer would know what value it holds. Your variable name should be at least two words.

4.) (3 points) Declare and calculate a double, averageAge, if you have (as integers) sumAges and totalPeople.

5.) (2 points) Give me two good reasons why you should always comment your code.

6.) (2 points) Circle the expression you would use? Why?

   if (myVar == 15)       if(15 == myVar)

7.) (2 points) Why is information hiding a good thing?
8.) (2 point) The two values of a bit are ___ and ___.

9.) (3 points) Explain how and when to use each of the following?
   a.) =
   
   b.) ==
   
   c.) equals()

10.) (2) Suppose you have the variable $s$ of type String that has been initialized to "Spring break! Woo!" Write the data stored in $s$ and place the index of each character below the string.

11.) (5) Give the return type and value for the following method calls on $s$ as defined in problem 10.
   a.) $s.length();$
   
   b.) $s.charAt(8);$
   
   c.) $s.indexOf("!");$
   
   d.) $s.lastIndexOf("r");$
c.) s.substring(14);

12.) (10 points) In the code that follows, underline all Classes, circle all objects, draw boxes around all methods, and draw a line through all arguments.

Scanner sc = new Scanner(System.in);

System.out.println("Do you think exams are fun?");

String s = sc.nextLine();

if(s.equals("yes"))
{
    System.out.print("Really?");
}
else if(s.equals("no"))
{
    String s2 = new String("me neither");

    System.out.print(s2);
}
Part 2. (30 points) Choose any THREE questions.
For questions 13-16, write the output for the piece of code if it compiles. If it does not compile, tell me what error I made.

13.) (8 points)

```java
int i = 4;
int total = 0;
while (i < 7)
{
    int j = i;
    j = (j * 4) % 15;
    total += j;
    System.out.print(j + " + ");
    i++;
}
total += j;
System.out.print( j + " = " + total);
```

14.) (10 points)

```java
for(int i = 1; i < 8; i += 3)
    for(int j = 8; j > i; j -= 2)
        System.out.print(j + " ");
```
15.) (12 points) Given the input order:
4 10 17 1 2 7 20 100

Scanner sc = new Scanner(System.in);
int sum = 0;
int a = sc.nextInt();
do
{
    if (a % 3 == 1)
    {
        sum += a;
        System.out.print(a + " ");
    }
    else
    {
        sum += 2*a;
        System.out.print(2*a + " ");
    }
    System.out.print("+ ");
a = sc.nextInt();
}while (!(sum > 50));

System.out.println("= " + sum);
public static void methodFun(int x, int y)
{
    String s = null;
    switch ((x + y) % 5)
    {
        case 4: s = " compile again";
            break;
        case 3: s = " big bugs";
            break;
        case 1: s = " fix one bug,"
            break;
        case 2: s = " little bugs";
            break;
        case 0: s = " fix a bug";
            break;
        default:
            break;
    }
    System.out.print(s);
}

public static void main(String[] args)
{
    int x = 3, y = 4, z = 4;

    if ( (z < x) && (y < z) ) System.out.print("Go Heels");
    else System.out.print((x * y * z + 52));

    while (z != 0)
    {
        if ((x - y) >= 0)
        {
            if (x < 9)
            {
                System.out.print(" in the code
" +(25*x-25));
                methodFun(z-1, x);
                System.out.println("\n");
            }
            else
            {
                methodFun(x,z);
                x += 4;
            }
        }
        else
        {
            methodFun(z,x);
            x += 2;
        }
        z --;
    }
    System.out.print("\n" + ((y * 25) + (z + 1)));
    methodFun(z,x);
    System.out.print(" in the code...");
}
Part 3. (30 points) Choose any TWO questions

17.) (10 points) Write code (using a loop) to calculate the value $2^n$. Assume $n$ is a non-negative integer that is already declared and initialized number. Store the answer in a new variable called $p$ that is not yet created.

18.) (15 points) Write the code for removing the first and last word of any string. (Example: “Spring break! Woo! Hoo!” would return “break! Woo!”) Do not worry about error checking. I will not take off for simple syntax or off-by-one errors. You should only need methods from problem 11.
19.) (20 points) The Fibonacci sequence is defined such that a number in the sequence is
the sum of the previous two numbers in the sequence such that the first two numbers are
0, 1.

The Fibonacci sequence: 0, 1, 1, 2, 3, 5, 8, 13, 21, …

Write a function, fib that takes an integer as input and displays the Fibonacci sequence to
the first value greater than the input.

Example: fib(6) would display 0, 1, 1, 2, 3, 5, 8