Fall 2017 CS 163/164
Exam 1 Prep

Java....
Java Everywhere!
Variables
Name the 8 primitive types
char, int, double, float, long, short, byte, boolean
Declare and assign a float variable called \(f\) to 9.
float f = 9F;
What is the difference between declaring, assigning, and initializing?
Declaring just tells the computer that you’ll use this variable sometime. Example: char c;

Assigning just assigns a value to the variable. Example c = ‘a’;

Initializing does declaring and assigning in one step. Example int i = 3;

**Note: You only declare or initialize once per variable, but you can assign (or re-assign) as many times as you want**
What is printed?

```java
public class Practice {
    public static void main (String [] args) {
        int i = 9;
        double pi = 3.14;
        i = (int) pi;
        pi = (double) i;
        System.out.println("i: " + i);
        System.out.println("pi: " + pi);
    }
}
```
i: 3
pi: 3.0
What is printed?

```java
public class Practice {
    public static void main(String[] args) {
        int i0 = 1;
        int i1 = 3;
        System.out.println("i0/i1: " + i0/i1);
        double result0 = i0/i1;
        System.out.println("double i0/i1: " + result0);

        double d0 = 1.0;
        double d1 = 3.0;
        System.out.println("d0/d1: " + d0/d1);
        int result1 = (int)(d0/d1);
        System.out.println("int d0/d1: " + result1);
    }
}
```
\[i_0/i_1: 0\]
\[\text{double } i_0/i_1: 0.0\]
\[d_0/d_1: 0.33333333333333333\]
\[\text{int } d_0/d_1: 0\]
Given the predefined char variable called c. Declare an int variable called i and assign it to the ASCII value of c. For example, if c = ‘a’, then i = 97.
int i = (int) c;
Printing (print, println, printf)
Write a print, println, and printf statement that prints the following:

```java
name
assignment
year
```

`name (String), assignment (String), and year (int)` are pre-defined variables.
// using print
System.out.print(name + "\n");
System.out.print(assignment + "\n");
System.out.print(year + "\n");
// OR
System.out.print(name + "\n" + assignment + "\n" + year + "\n");

// using println
System.out.println(name);
System.out.println(assignment);
System.out.println(year);

//using printf
System.out.printf("%s\n%s\n%d\n", name, assignment, year);
Print the following pre-defined variables in the format below (ending with a newline). GPA should print with 2 decimals:

Age: age, Name: first, GPA: gpa

Note: age (int), first(String), gpa(double) are pre-defined variables.
System.out.printf("Age: %d, Name: %s, GPA: %.2f\n", age, name, gpa);
Scanners
Initialize a Scanner called **reader** that reads from the keyboard.
Scanner reader = new Scanner (System.in);
Read in a double from the pre-defined Scanner called `reader` and store it into the pre-defined variable `d`. 
d = reader.nextDouble();
Read in an int from the pre-defined Scanner called `reader` and store it into the pre-defined variable `i`. 
i = reader.nextInt();
Read in one word from the pre-defined Scanner called **reader** and store it into the pre-defined variable **s**.
s = reader.next();
Read in one line from the pre-defined Scanner called **reader** and store it into the pre-defined variable **line**.
line = reader.nextLine();
Close the Scanner called reader.
reader.close();
Conditionals
Store the result when you check if the pre-defined int variables \texttt{i1} and \texttt{i2} are equal into the pre-defined boolean variable \texttt{b}. 
// the parenthesis are optional
b = (i1 == i2);
Write an if statement that prints “between 0 and 100” on a new line, when the predefined variable int \( i \) is between 0 and 100.
if (i >= 0 && i <= 100)
    System.out.println("between 0 and 100");
Write an if statement that prints “char is a or c” on a new line, when the predefined variable char c is either ‘a’ or ‘c’.
if (c == 'a' || c == 'c')
    System.out.println("char is a or c");
Write a switch statement based on the following information:
- if the integer \( i \) is 0, print “zero”
- if the integer \( i \) is 1, print “one”
- if the number \( i \) is 2, print “two”
- if the number \( i \) is anything else, print “less than zero or greater than two”
switch (i) {
    case 0: System.out.println("zero"); break;
    case 1: System.out.println("one"); break;
    case 2: System.out.println("two"); break;
    default: System.out.println("less than zero or greater than two");
}

// Optional: You could also have a break on the default statement
What does this code print?

```java
public class Practice {
    public static void main (String [] args) {
        double d = 3.2;
        if (d < 3.5)
            System.out.println("less than 3.5");
        else if (d < 3.3)
            System.out.println("less than 3.3");
        else if (d <= 3)
            System.out.println("less than or greater than 3");
        else
            System.out.println("greater than or equal to 3.5");
    }
}
```
less than 3.5
What does this code print?

```java
public class Practice {
    public static void main (String [] args) {
        double d = 3.2;
        if (d < 3.5)
            System.out.println("less than 3.5");
        if (d < 3.3)
            System.out.println("less than 3.3");
        if (d <= 3)
            System.out.println("less than or equal to 3");
        else
            System.out.println("greater than or equal to 3.5");
    }
}
```
less than 3.5
less than 3.3
greater than or equal to 3.5
What does this code print?

```java
public class Practice {
    public static void main (String [] args) {
        char c = 'g';
        boolean b = false;
        if (c > 'b' && c < 'z' || c == 'g')
            b = true;
        if (c == 'a' && c == 'g')
            b = false;
        if (b == true && c == 'g')
            b = true;
        System.out.println("Value of b: " + b);
    }
}
```
Value of b: true
Strings
Print the 2nd through the 4th character of the pre-defined String s.

Note: You can assume the string s is at least four characters.
System.out.println(s.substring(1,4));
Print the index of the first instance of the letter ‘c’ and the third letter of the pre-defined String $s$ separated by a space.

(For example, the program would output “0 e” if the $s = “creature”$).
System.out.println(s.indexOf('c') + " " + s.charAt(2));
Print out the length of the pre-defined String s.
System.out.println(s.length());
Print the comparison of the two pre-defined Strings \textbf{s1} and \textbf{s2} and the comparison of the two pre-defined ints \textbf{i1} and \textbf{i2} separated by a comma.

For example: If \textit{s1} = "hi" and \textit{s2} = "hello", \textit{i1} = 3 and \textit{i2} = 3. The program would output "false,true"
System.out.println(s1.equals(s2) + "," + (i1 == i2));

Note: The parenthesis are required!
If you stored the results in boolean values you would not need the parenthesis
What does this code print?  
Note: If there is an error in the code, write “error”

```java
public class Practice {
    public static void main (String [] args) {
        String s = "Davy Jones";
        String sl = "Pirates";

        System.out.println(sl.substring(0));
        System.out.println(s.concat(sl));
        sl.toLowerCase();
        System.out.println(sl);
        System.out.println(s.indexOf('x'));
        System.out.println(sl.length());
        System.out.println(sl.charAt(7));
    }
}
```
Pirates
Davy Jones
Pirates
-1
7
error
Wrapper Classes
Given a String $s$ that has an int value (“4”), store the integer value into the pre-defined int variable $i$. 
i = Integer.parseInt(s);
Given a String \( s \) that has a double value (“3.14”), store the integer value into the pre-defined double variable \( d \).
d = Double.parseDouble(s);
What does this code print?

```java
public class Practice {
    public static void main (String [] args) {
        char c1 = 'a';
        char c2 = 'Z';
        char c3 = '3';
        boolean b = false;
        if (Character.isUpperCase(c1) || Character.isLowerCase(c2) || Character.isLetter(c1))
            b = true;
        if (Character.isLetter(c3))
            b = false;
        System.out.println(b);
    }
}
```
true