

C212/A592 Lab 3

Intro to Software Systems

Objectives:

- Implementing method
- Reading values from keyboard (Using Scanner class)
- Using a simple loop
- Casting
- Working with strings

Lab instructions

1. Create a class named Lab3Exercises
2. Implement the following static methods (we will not use this class to *instantiate objects*)
 - a. *public static boolean palidrome(String myPString)*
 - i. Implement a function that can check whether or not the resulting word is a Palindrome. Such strings are the same when you write them backwards. For example: racecar. This word written in reverse is also racecar, thus, it is a palindrome. You must use a **while** loop to reverse your original string. The function returns true if the argument is a palindrome otherwise returns false.
 - ii. Use the *Scanner* class covered in lecture to get input from the user and pass that as a parameter to the method above.
 - b. *public static String numbers()*
 - i. Using the *Scanner* class and a while loop, continue to process integer values from a user until they have entered a value other than an *int*. To keep it simple, let's assume that numbers are between 0 and 9.
 - ii. Excluding any duplicates values, Calculate the sum of all unique numbers, the min value, and the max value and return a *String* with the following format: SUM,MIN,MAX
 - iii. Do not use Java's *min* or *max* methods
 - c. *public static String grade()*
 - i. Using *the Scanner* class, process a double value between [0 – 100]. Return a String value of the letter grade.
 - ii. e.g., input = 85.5 return "Your grade is a B"
 - iii. *grade greater than 92.1 –A*
 - iv. *grade greater than 82.1 –B*
 - v. *grade greater than 72.1 –C*
 - vi. *grade greater than 62.1 –D*
 - vii. *grade less than 62.1 –F*

- d. *public static String intToBinary(int n)*
- Implement a method that converts the positive integer value to its binary representation and returns it as a *String*. You do not need to have leading zeroes, e.g., 1 in binary is 1, 2 in binary is 10, 3 in binary is 11
Note: Do not use the java method *Integer.toBinaryString(N)*
 - Here are two very good explanations to converting an integer value to binary <http://www.wikihow.com/Convert-from-Decimal-to-Binary>
 - Examples:
intToBinary(4) returns 100
intToBinary(8) returns 1000

e. Answer the following questions as comments below your class file:

- Give the type and value for each of the following expressions:
 - $(1 + 2.236)/2$
 - $1 + 2 + 3 + 4.0$
 - $4.1 \geq 40$
 - $1 + 2 + "3"$
- Give the value printed by each of the following code fragments:
 - The following code in 1 is using Newton's Method to calculate the square root of a number

```
double t = 9.0;
while (Math.abs(t - 9.0/t) > .001) {
    t = (9.0/t + t) / 2.0;
}
System.out.println(t);
```

```
2. int sum = 0;
   for (int i = 1; i < 1000; i++) {
       for (int j = 0; j < 1000; j++) {
           sum++;
       }
   }
   System.out.println(sum);
```

```
3. int sum = 0;
   for (int i = 1; i < 1000; i *= 2) {
       for (int j = 0; j < 1000; j++) {
           sum++;
       }
   }
   System.out.println(sum);
```