Lab 2 Part 1 Sample Answers

Question 1

```
import java.util.Scanner;

public class InchesToMeters {
   public static void main(String[] args) {
      System.out.print("Input a value for inches: "); // hint for input
      Scanner input = new Scanner(System.in); // create a Scanner
      double inch = input.nextDouble(); // obtain the input value
      // Conversion
      double meters = inch * 0.0254;
      System.out.println(inch + " inches is " + meters + " meters");
   }
}
```

Question 2

```
import java.util.Scanner;

public class SumOfDigits {
   public static void main(String[] args) {
      System.out.print("Input an integer between 0 and 1000: "); // hint for input
      Scanner input = new Scanner(System.in); // create a Scanner
      int int_3 = input.nextInt(); // obtain a 3 digits integer
      int digitSum = 0; // define a var to store sum of digits
      int divisor = int_3;
      while(divisor > 0) {
         digitSum += divisor % 10; // add the latest last digit
         divisor /= 10; // update the divisor
      }
      System.out.println("The sum of all digits in " + int_3 + " is " + digitSum);
   }
}
```

Question 3

```
public class CheckPassFail {
   public static void main(String[] args) {
      int mark = 49; // set the value of "mark"
      System.out.println("The mark is " + mark);
      // classify mark
      if(mark >= 50) {
         System.out.println("PASS");
      } else {
         System.out.println("FAIL");
      }
      System.out.println("DONE");
   }
}
```

Question 4

```
public class CheckOddEven {
   public static void main(String[] args) {
      int number = 49; // set value of "number"
      System.out.println("The number is " + number);

      if(number % 2 == 1) { // odd
         System.out.println("Odd Number");
      } else {
```

```
            System.out.println("Even Number");
        }
        System.out.println("BYE!");
    }
}
```

Question 5

```
public class PrintNumberInWord {
    public static void main(String[] args) {
        int number = 5; // value of number

        // Using nested-if
        if(number == 1) {
            System.out.println("ONE");
        } else if(number == 2) {
            System.out.println("TWO");
        } else if(number == 3) {
            System.out.println("THREE");
        } else if(number == 4) {
            System.out.println("FOUR");
        } else if(number == 5) {
            System.out.println("FIVE");
        } else if(number == 6) {
            System.out.println("SIX");
        } else if(number == 7) {
            System.out.println("SEVEN");
        } else if(number == 8) {
            System.out.println("EIGHT");
        } else if(number == 9) {
            System.out.println("NIGHT");
        } else {
            System.out.println("OTHER");
        }
        // Using switch-case
        switch(number) {
        case 1:
            System.out.println("ONE");
            break;
        case 2:
            System.out.println("TWO");
            break;
        case 3:
            System.out.println("THREE");
            break;
        case 4:
            System.out.println("FOUR");
            break;
        case 5:
            System.out.println("FIVE");
            break;
        case 6:
            System.out.println("SIX");
            break;
        case 7:
            System.out.println("SEVEN");
            break;
        case 8:
            System.out.println("EIGHT");
            break;
        case 9:
            System.out.println("NIGHT");
            break;
        default:
            System.out.println("OTHER");
            break;
        }
```

```
    }
}
```

Question 6

```
public class SumAndAverage {
   public static void main(String[] args) {
      int sum = 0; // Store the accumulated sum init to 0
      double average; // average in double
      int lowerbound = 1; // The lowerbound to sum
      int upperbound = 100; // The upperbound to sum

      // Use a for-loop to sum from lowerbound to upperbound
      for(int number = lowerbound; number <= upperbound; number++) {
         sum += number; // same as "sum = sum + number"
      }
      // Compute average in double. Beware that int/int produces int.
      average = (double) sum / (upperbound - lowerbound + 1);
      // Print sum and average
      System.out.println("The sum is " + sum);
      System.out.println("The average is " + average);

      // 6.1 while loop
      System.out.println("---- While-loop:");
      sum = 0;
      int number = lowerbound;
      while(number <= upperbound) {
         sum += number;
         number++;
      }
      // Compute average in double. Beware that int/int produces int.
      average = (double) sum / (upperbound - lowerbound + 1);
      // Print sum and average
      System.out.println("The sum is " + sum);
      System.out.println("The average is " + average);

      // 6.2 do-while
      System.out.println("---- Do-while:");
      sum = 0; // Reset sum
      number = lowerbound;
      do {
         sum += number;
         number++;
      } while(number <= upperbound);
      // Compute average in double. Beware that int/int produces int.
      average = (double) sum / (upperbound - lowerbound + 1);
      // Print sum and average
      System.out.println("The sum is " + sum);
      System.out.println("The average is " + average);

      // 6.3 Sum from 111 to 8899
      System.out.println("---- Sum from 111 to 8899:");
      // Reset variables: sum, lowerbound, upperbound
      sum = 0;
      lowerbound = 111;
      upperbound = 8899;
      number = lowerbound;
      do {
         sum += number;
         number++;
      } while(number <= upperbound);
      // Compute average in double. Beware that int/int produces int.
      average = (double) sum / (upperbound - lowerbound + 1);
      // Print sum and average
      System.out.println("The sum is " + sum);
      System.out.println("The average is " + average);
   }
```

```
}
```

Question 7

```
import java.util.Scanner;

public class ReverseString {
   public static void main(String[] args) {
      System.out.print("Enter a String: ");
      Scanner in = new Scanner(System.in);
      String inStr = in.next(); // use next() to read a string
      int inStrLen = inStr.length(); // obtain the length of the input string

      System.out.print("The reverse of the String \"" + inStr + "\" is \"");
      // Use inStr.charAt(index) in a loop to extract character at "index" from inStr
      // The string's index begins at 0 from the left
      for(int i = inStrLen - 1; i >= 0; i--) { // Process the string from the right
         System.out.print(inStr.charAt(i));
      }
      System.out.println("\"");
   }
}
```

Question 8

```
import java.util.Scanner;

public class TestPalindrome {
   public static void main(String[] args) {
      System.out.print("Enter a String: ");
      Scanner in = new Scanner(System.in);
      String inStr = in.next(); // read string
      String lowStr = inStr.toLowerCase(); // convert to lowercase

      int fIdx = 0, bIdx = inStr.length() - 1; // forward & backward indexes
      char fChar, bChar; // forward & backward characters
      while(fIdx < bIdx) {
         fChar = lowStr.charAt(fIdx);
         bChar = lowStr.charAt(bIdx);
         if(fChar != bChar) {
            System.out.println("\"" + inStr + "\" is not a palindrome");
            return;
         } else { // match, change index
            fIdx++;
            bIdx--;
         }
      }
      System.out.println("\"" + inStr + "\" is a palindrome");
   }
}
```

Question 9

```
import java.util.Scanner;

public class GradesAverage {
   public static void main(String[] args) {
      System.out.print("Enter the number of students: "); // hint for input
      Scanner input = new Scanner(System.in); // create a Scanner
      int numStudents = input.nextInt(); // Obtain number of students
      int grades[] = new int[numStudents]; // Array stores grades of every student
      int sumGrades = 0; // Store sum of grades
      for(int i = 0; i < numStudents; i++) { // Enter grade and sum the grade
         System.out.print("Enter the grade for student " + (i + 1) + ": ");
         grades[i] = input.nextInt();
```

```
            if(0 <= grades[i] && grades[i] <= 100) { // if between 0 and 100
                sumGrades += grades[i];
            } else { // invalid
                i--;
                System.out.println("Invalid grade, try again...");
            }
        }
        System.out.println("The average is: " + (double) sumGrades / numStudents);
    }
}
```