**CSCI 1100 – September 2016**

**Laboratory Report 6**

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| **Please mark your lab** | | | | | | |
| **T 8:30 L143** | **T 8:30 L134** | **T 8:30 L133** | **T 11:30 L143** | **T 11:30 L133** | **T 11:30 L142** | **T 2:30 L143** |
| **T 5:30 L143** | **T 5:30 L142** | **W 11:30 143** | **W 4:30 143** |

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| **Declaration: Please complete this declaration or your lab may not be graded** | | |
| 1 | This document is entirely my own work. Your lab should be the efforts of your own work. However, you may need to look something up to help you or ask someone for help. If acquired help (online or with someone) you need to acknowledge this below. | Yes |
| 2 | I obtained some help to complete this document. | No. |
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**Exercise 0.**  [Very important exercise. No marks.] TAs please go over some of these pieces of code carefully with the students. What is the output of each piece? Let them write down their answer. Help them check it. Then compile and run each piece of the code and verify if they were right.

int i = 1;   
while(i < 3) {

System.out.print(i \* 12 + " "); //🡪\_\_\_\_\_\_\_\_\_\_\_\_\_

i = i + 1;   
}

i = 2;

while(i <= 3) {

System.out.print(i \* 12 + " "); //🡪\_\_\_\_\_\_\_\_\_\_\_\_\_

i = i + 1;  
}

i = 1;

while(i < 3) {  
 i = i + 1;

System.out.print(i \* 12 + " "); //🡪\_\_\_\_\_\_\_\_\_\_\_\_\_

}

i = 2;

while(i <= 3) {  
 i = i + 1;

System.out.print(i \* 12 + " "); //🡪\_\_\_\_\_\_\_\_\_\_\_\_\_

}

i = 1;

while(i >= 0) {

System.out.println(i + " Ooops"); //🡪\_\_\_\_\_\_\_\_\_\_\_\_\_

}

**Exercise 1.** Write a program that uses a Scanner to read a number between 1 and 5 (N) and two different city names. If the number entered is odd it will print the first city N times; if the number is even it will print the second city N times. Test the program two times with two different inputs that show both conditions. (Hint: the Scanner method next() will read a single word entered on a line). For example:

Please type a number between 1 and 5: 5

Please type two cities: Truro Halifax

Truro

Truro

Truro

Truro

Truro

**Code:**

/\*CSCI 1100 – Lab 6 – Excercise 1

This program will take an integer between 1 and 5

and the names of two cities, if the number is odd

it will print the name of the first city n times,

if the number is even it will print the name of the

2nd city n times

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import java.util.Scanner; // import java Scanner

public class Q1 {

public static void main(String[] args) {

// Create an instance of the scanner class

Scanner input = new Scanner(System.in);

// Ask the user to enter a number

System.out.print("Please type a number between 1 and 5: ");

// Store the number in a variable

int num = input.nextInt();

// consume the rest of the line

input.nextLine();

// Ask the user to enter the name of the cities

System.out.print("Please type two cities: ");

// Store the names in a variable

String cities = input.nextLine();

// Split the string based on space and store it in array

String[] splitedCities = cities.split(" ");

// Ckeck the number

if (num%2 == 0) {

// if number is even; loop as long as num is more than 0

while (num>0){

// Print out the name of the city

System.out.println(splitedCities[1]);

// Decrease the value of number by one

num--;

}

// if number is odd

}else{

// Loop as long as num is more than 0

while (num>0){

// Print out the name of the first city

System.out.println(splitedCities[0]);

// decrease the value of the number by one

num--;

}

}

}

}

Please type a number between 1 and 5: 4

Please type two cities: Tantallon Hubbards

Hubbards

Hubbards

Hubbards

Hubbards

Please type a number between 1 and 5: 3

Please type two cities: Berlin Kosovo

Berlin

Berlin

Berlin

**Exercise 2.** Write a program that uses a Scanner to read a number (say N) and prints the sequence of multiples of N up to exactly N x N. You should test your program twice using two different numbers. It works as follows:

Please type a number: 8

8 16 . . . 64

Please type a number: 12

12 24 . . . 144

Please type a number: 16

16 32 . . . 256

**Code:**

/\*CSCI 1100 – Lab 6 – Excercise 2

This program will take an integer then

gives back the the sequence of multiples untill it reaches

num \* num

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import java.util.Scanner; // import Scanner class

public class Q2 {

public static void main(String[] args) {

int counter = 1;

String total = "";

// Create an instance of the Scanner Class

Scanner input = new Scanner(System.in);

// Ask the user to enter a number

System.out.print("Please type a number: ");

// Store the value in a variabe

int num = input.nextInt();

// loop till reach counter = num

while (num >= counter) {

// mutiply the counter by the num and add to the string

total += (counter \* num);

// Add an empty space between each number

total += " ";

// Increase the counter by one

counter++;

}

// Print out the final result

System.out.println(total);

}

}

Please type a number: 7

7 14 21 28 35 42 49

Please type a number: 12

12 24 36 48 60 72 84 96 108 120 132 144

**Exercise 3.** The cost this year (2016) of a car is $25000. Each year the cost increases by 6.5%. Write a Java program that asks you to type a number (say N) representing a time period in years. The program then prints the cost of the car yearly for N years starting in 2016. The program must use a while loop to compute and print the results. You need not concern yourself with the exact display of the decimal point. Test this program with two different numbers of years. The program works as follows:

Please type a number of years: 10

Year: 2016 - Cost 25000.0

Year: 2017 - Cost 26625.0

. . .

Year: 2026 - Cost xx

**Code:**

/\*CSCI 1100 – Lab 6 – Excercise 3

This program will calculate the increase cost of the car

over the entered number of years

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import java.util.Scanner; // import Scanner class

public class Q3 {

public static void main(String[] args) {

int date = 2016;

double cost = 25000;

// Create an instance of the Scanner class

Scanner input = new Scanner(System.in);

// Ask the user to enter a number

System.out.print("Please type a number of years: ");

// Store the value the user entered

int years = date + input.nextInt();

// Consume the rest of the line

input.nextLine();

// Loop till the end year

while (date<years){

// Print out the price and the year

System.out.println("Year: "+date+"- Cost "+cost);

// Calculate the cost of the car

cost += cost \* 0.065;

// Increase the date by one

date++;

}

}

}

Please type a number of years: 8

Year: 2016- Cost 25000.0

Year: 2017- Cost 26625.0

Year: 2018- Cost 28355.625

Year: 2019- Cost 30198.740625

Year: 2020- Cost 32161.658765624998

Year: 2021- Cost 34252.16658539062

Year: 2022- Cost 36478.55741344101

Year: 2023- Cost 38849.66364531468

Please type a number of years: 5

Year: 2016- Cost 25000.0

Year: 2017- Cost 26625.0

Year: 2018- Cost 28355.625

Year: 2019- Cost 30198.740625

Year: 2020- Cost 32161.658765624998

**Exercise 4.** Write a program to read two integer numbers. If the first number is smaller than the second number, then the program will write all numbers starting from the smallest number to the largest number (the numbers between the two numbers in increasing order). If the first number is larger than the second number, then the program will print all the numbers going from largest to the smallest (the numbers between the two numbers in decreasing order). If the two numbers are the same, then use a while loop to keep asking the user to enter two different numbers until the user inputs two different numbers. Test this program three times: once showing inputting a smaller than larger number, a larger followed by a smaller number, and when the numbers are the same where it takes the user at least 3 times to get the numbers correct.

Sample output.

Please type two numbers: 200 190

200 199 198 197 ... 190

Please type two numbers: 4 121

4 5 6 7 . . . . 121

Please type two numbers: 4 4

Error: the numbers must be different. Try Again.

Please type two numbers: 21 21

Error: the numbers must be different. Try Again.

Please type two numbers: 5 5

Error: the numbers must be different. Try Again.

Please type two numbers: 1 4

1 2 3 4

**Code:**

/\*CSCI 1100 – Lab 6 – Excercise 4

This program will ask the user to enter two numbers

if the 1st number is greater then it will print the

numbers decreasing till it reaches the 2nd number,

if the 1st number is smaller then print the numbers

up till reach 2nd number, if numbers equal try again

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import java.util.Scanner; // import Scanner Class

public class Q4 {

public static void main(String[] args) {

String total = "";

int num1 = 0, num2 = 0;

// Create instance of the Scanner class

Scanner input = new Scanner(System.in);

// If the numbers equal start again

while (num1 == num2){

// Ask the user to enter two integers

System.out.print("Please type two numbers: ");

// Store the value into integers

num1 = input.nextInt();

num2 = input.nextInt();

// Evaluate the two number

if (num1>num2) {

// Enter a loop

while (num1>=num2){

// Add the result to total

total+= num1;

// Add a space between numbers

total += " ";

// Decrease the first number by one

num1--;

}

}

// If the first number is smaller than the 2nd

else if (num1<num2) {

while (num1<=num2){

// Add the result to total

total += num1;

// Add a space between numbers

total += " ";

// Increase the first number

num1++;

}

}

// If the numbers are equal

else{

// Ask the user to try again

System.out.println("Error the numbers must be different. Try Again.");

}

}

// Print out the result

System.out.println(total);

}

}

Please type two numbers: 4 20

4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

Please type two numbers: 20 4

20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4

Please type two numbers: 1 1

Error the numbers must be different. Try Again.

Please type two numbers: 11 11

Error the numbers must be different. Try Again.

Please type two numbers: 21 21

Error the numbers must be different. Try Again.

Please type two numbers: 200 190

200 199 198 197 196 195 194 193 192 191 190

**Exercise 5.** Write a program that prints the total of a grocery bill. It will first ask how many items are on the bill (N), and the tax rate. Then it will ask for cost of item 1, item 2… to item N. Finally, it will print the total before taxes, the total tax on the bill, and Final Total (total plus tax). Don't worry about controlling for the decimal. Test the program twice using a different number of items to enter (both should be at least 3) that have two different tax rates.

Sample output.

Please enter the number of items in the bill: 4

Please enter the tax rate: %10

Enter the cost of item 1: $2.65

Enter the cost of item 2: $3.15

Enter the cost of item 3: $6.75

Enter the cost of item 4: $2.60

Total (before tax): $15.13

Total tax (10%): $1.513

Final Total: $16.643

**Code:**

/\*CSCI 1100 – Lab 6 – Excercise 5

This program will take an integer then

gives back the the sequence of multiples untill it reaches

num \* num

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import java.util.Scanner; // import Scanner Class

public class Q5 {

public static void main(String[] args) {

int counter = 1;

double total = 0, taxed = 0;

// Create an instance of the Scanner class

Scanner input = new Scanner(System.in);

// Ask the user to enter the number of items

System.out.print("Please enter the number of items in the bill: ");

// Store the value in a variable]

int items = input.nextInt();

// Consume the rest of the line

input.nextLine();

// Ask the user for the tax rate

System.out.print("Please enter the tax rate: %");

// Store the value in a variable

int tax = input.nextInt();

// consume the rest of the line

input.nextLine();

// loop to get the prices

while (counter <= items){

// Ask the user to enter the price

System.out.print("Enter the cost of item "+counter+": ");

// Add the price to the total

total += input.nextDouble();

// Consume the rest of the line

input.nextLine();

// Increase the counter by one

counter++;

}

// Print out the total without taxes

System.out.println("Total (before tax):\t $"+total);

// Calculate the tax

taxed = (total\*tax)/100;

// Print out how much is the tax

System.out.println("Total tax ("+tax+"%):\t $"+taxed);

// Print out the total with taxes

System.out.println("Final Total: \t\t $"+(total+taxed));

}

}

Please enter the number of items in the bill: 3

Please enter the tax rate: %15

Enter the cost of item 1: 4.79

Enter the cost of item 2: 6.82

Enter the cost of item 3: 5.49

Total (before tax): $17.1

Total tax (15%): $2.565

Final Total: $19.665000000000003

Please enter the number of items in the bill: 4

Please enter the tax rate: %10

Enter the cost of item 1: 1.99

Enter the cost of item 2: 8.15

Enter the cost of item 3: 3.49

Enter the cost of item 4: 5.99

Total (before tax): $19.62

Total tax (10%): $1.9620000000000002

Final Total: $21.582