**CSCI 1100 – September 2016**

**Laboratory Report 7**

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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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**Exercise 0.** *TAs please revise simple for loop code. Show the students* a program containing 2 for loops that prints the following lines using while loops then change to for loops:

1 2 3 4 5 6 7 8 9 10

8 10 12 14 16 18 20 22 24 26

**Exercise 1.** Write a program containing 5 while loops that prints the following lines and show the output for each:

3 6 9 12 15 18 21 24 27 30

9 8 7 6 5 4 3 2 1 0

1 3 5 7 9 11 13 15 17 19

0 2 4 6 8 10 12 14 16 18

18 16 14 12 10 8 6 4 2 0

/\*CSCI 1100 – Lab 7 – Exercise 1

This program will print the output of 5 while loops

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public class E1 {

public static void main(String[] args) {

// Initilize a few variables to be used later

int i =3, j=9, k=1, m=0, l=18;

// Start while loop till it reaches 30

while (i<=30) {

// add the number to the string and print when done

System.out.print(i+" ");

// add 3 each iteration

i+=3;

}

// new line

System.out.println();

// Start while loop till it reaches 0

while (j>=0) {

// add the number to the string and print when done

System.out.print(j+" ");

// decrease by 1 each iteration

j--;

}

// new line

System.out.println();

// Start while loop till it reaches 19

while (k<=19) {

// add the number to the string and print when done

System.out.print(k+" ");

// add 2 for each iteration

k+=2;

}

// new line

System.out.println();

// Start while loop till it reaches 18

while (m<=18) {

// add the number to the string and print when done

System.out.print(m+" ");

// increase by 2 each iteration

m+=2;

}

// new line

System.out.println();

// Start while loop till it reaches 0

while (l>=0) {

// add the number to the string and print when done

System.out.print(l+" ");

// decrease by 2

l-=2;

}

System.out.println();

}

}

**Exercise 2.** Write a program containing 5 for loops that does the same as exercise 1. Show the output from each loop.

/\*CSCI 1100 – Lab 7 – Exercise 2

This program will print the output of 5 for loops

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public class E2 {

public static void main(String[] args) {

// Start a for loop from 3 to 30 and increase by 3

for (int i = 3;i<=30 ;i+=3 ) {

// add the number to the string and print when done

System.out.print(i+" ");

}

// new line

System.out.println();

// Start a for loop from 9 to 0 and decrease by 1

for (int j = 9;j>=0 ;j-- ) {

// add the number to the string and print when done

System.out.print(j+" ");

}

//new line

System.out.println();

// Start a for loop for 1 to 19 and increase by 2

for (int k = 1;k<=19 ;k+=2) {

// add the number to the string and print when done

System.out.print(k+" ");

}

// new line

System.out.println();

// Start a for loop from 0 to 18 and increase by 2

for (int l = 0;l<=18 ;l+=2 ) {

// add the number to the string and print when done

System.out.print(l+" ");

}

// new line

System.out.println();

// Start a for loop from 18 to 0 and decrease by 2

for (int m = 18;m>=0 ;m-=2 ) {

// add the number to the string and print when done

System.out.print(m+" ");

}

// new line

System.out.println();

}

}

**Exercise 3.** Write a program that could be used by a grocery store to calculate the total of a grocery order and the tax on this order. For some foods (e.g., fresh vegetables and fruits) no tax is added, but for many processed foods and junk food tax is added (e.g., frozen pizza and chips). First, ask the user for how many grocery items there are, then the tax rate. Then using a for loop ask the user to enter in the price for all the items and for each item ask if tax should be added. Keep track of all the prices and tax. Test the program with two sets of grocery orders that have at least 4 items. The program works as follows:

Welcome to your ABC Grocery Store

Enter the number of items you have: 4

Enter the tax rate: .1

Enter the price of your item: 3.4

Is the item taxable (1 for yes, 2 for no): 2

Enter the price of your item: 1.0

Is the item taxable (1 for yes, 2 for no): 1

Enter the price of your item: 2.50

Is the item taxable (1 for yes, 2 for no): 1

Enter the price of your item: 4.56

Is the item taxable (1 for yes, 2 for no): 2

Total before tax: $ 11.46

Total tax: $ 0.35

Total after tax: $ 11.81

/\*CSCI 1100 – Lab 7 – Exercise 3

This program will caculate how your grocery invoice

and tax you for certain things and give you back the

total and the tax and how much you should pay

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

public class E3 {

public static void main(String[] args) {

double total =0, taxed = 0;

// Create an instance of the Scanner class

Scanner input = new Scanner(System.in);

// Greet the costumer

System.out.println("Welcome to your ABC Grocery Store\n");

// Ask how many item does the client have

System.out.print("Enter the number of items you have: ");

// Store the value in a variable;

int items = input.nextInt();

// Ask for the tax rate

System.out.print("Enter the tax rate: ");

// Store the value in a variable

double tax = input.nextDouble();

// Enter a new line

System.out.println();

// Start a for loope from 0 to the number of items

for (int i =0; i<items ; i++) {

// tax per item will reset with ever iteration

double itemTax = 0;

// ask the user to enter the price of an item

System.out.print("Enter the price of your item: ");

// Store the value in a variable

double price = input.nextDouble();

// Ask the user if the item is taxable

System.out.print("Is the item taxable (1 for yes, 2 for no): ");

// the choice will reset with each iteration

int taxable = input.nextInt();

// if it is taxable

if (taxable == 1) {

// Calculate the item tax

itemTax = price\*tax;

}

// add the price to the total

total += price;

// add the tax to the total tax

taxed += itemTax;

}

// print out the results

System.out.println();

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

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

System.out.println("Total after tax: $"+(total+taxed));

}

}

Welcome to your ABC Grocery Store

Enter the number of items you have: 5

Enter the tax rate: .1

Enter the price of your item: 2.5

Is the item taxable (1 for yes, 2 for no): 1

Enter the price of your item: 3.5

Is the item taxable (1 for yes, 2 for no): 2

Enter the price of your item: 4.5

Is the item taxable (1 for yes, 2 for no): 1

Enter the price of your item: 5.5

Is the item taxable (1 for yes, 2 for no): 1

Enter the price of your item: 2.6

Is the item taxable (1 for yes, 2 for no): 1

Total before tax: $ 18.6

Total tax: $ 1.51

Total after tax: $20.110000000000003

Welcome to your ABC Grocery Store

Enter the number of items you have: 6

Enter the tax rate: .15

Enter the price of your item: 10

Is the item taxable (1 for yes, 2 for no): 1

Enter the price of your item: 5.3

Is the item taxable (1 for yes, 2 for no): 2

Enter the price of your item: 2.0

Is the item taxable (1 for yes, 2 for no): 2

Enter the price of your item: 1.0

Is the item taxable (1 for yes, 2 for no): 1

Enter the price of your item: 3.0

Is the item taxable (1 for yes, 2 for no): 1

Enter the price of your item: 4.0

Is the item taxable (1 for yes, 2 for no): 2

Total before tax: $ 25.3

Total tax: $ 2.0999999999999996

Total after tax: $27.4

**Exercise 4.** Write a program that uses a Scanner to read a word. Test the program 2 times (with different examples than below and with words that include upper and lower letters). The program will write as follows:

Please type a word: abcdeABCDEabcde

Length of word: 15

Upper Case: ABCDEABCDEABCDE

Lower Case: abcdeabcdeabcde

First Character: a

Middle Character: c

Last Character: e

/\*CSCI 1100 – Lab 7 – Exercise 4

This program will take a string and give back the length

of the string, the string with uppercase, lowercase,

first, middle and last character of the word

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

public class E4 {

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 word

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

// Store the word in a variable

String word = input.nextLine();

// Calculate the length of the word

int length = word.length();

// print out the length

System.out.println("Length of word: "+length);

// Print out the word in uppercase

System.out.println("Upper Case: "+word.toUpperCase());

// Print out the word in lowercase

System.out.println("Lower Case: "+word.toLowerCase());

// Print out hte first Character

System.out.println("First Character: "+word.charAt(0));

// Calculate the middle of the word

int mid = length/2;

// Print out the Char at the middle

System.out.println("Middle Character:"+word.charAt(mid));

// print out the chart at the end

System.out.println("Last Character: "+word.charAt(length-1));

}

}

Please type a word: HeLLo WorLD!

Length of word: 12

Upper Case: HELLO WORLD!

Lower Case: hello world!

First Character: H

Middle Character:W

Last Character: !

Please type a word: Study

Length of word: 5

Upper Case: STUDY

Lower Case: study

First Character: S

Middle Character:u

Last Character: y

**Exercise 5.** Write a program that uses a Scanner to read two words. The program will detect words that are the same (case does not matter). If the words are not the same, it will print a message with the length of each word. Test this program with two outputs - one word that is the same and one that is different.

Please type a word: abcde

Please type a word: abcdf

The words are: abcde and abcdf. These words are not the same. abcde has 5 letters and abcdf has 5 letters.

Please type a word: abcde

Please type a word: abcde

The words are: abcde and abcde. These words are the same.

/\*CSCI 1100 – Lab 7 – Exercise 5

This program will take two words and regardless of the case will return if

these words are teh same or not

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

public class E5 {

public static void main(String[] args) {

// Create an instance of the Scanner class

Scanner input = new Scanner(System.in);

// Ask the user to key-in the first word

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

// Store the word in a variable

String first\_word = input.nextLine();

// Ask the user to key-in the 2nd word

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

// Store the 2nd word in a variable

String second\_word = input.nextLine();

// Check to see if both words are the same after convert both to lowercase

if (first\_word.toLowerCase().equals(second\_word.toLowerCase())) {

// If the same then print the following output

System.out.println("The words are: "+first\_word+" and "+second\_word+". These words are the same.");

}else {

// if not the same then print the following output

System.out.print("The words are: "+first\_word+" and "+second\_word+". These words are ");

System.out.print("not the same. "+first\_word+" has "+first\_word.length()+" letters and ");

System.out.print(second\_word+" has "+second\_word.length()+" letters.");

}

}

}

Please type a word: Hello

Please type a word: World

The words are: Hello and World. These words are not the same. Hello has 5 letters and World has 5 letters.

Please type a word: Hello

Please type a word: hElLO

The words are: Hello and hElLO. These words are the same.

Please type a word: Reina

Please type a word: Arenia

The words are: Reina and Arenia. These words are not the same. Reina has 5 letters and Arenia has 6 letters.

**Exercise 6.** Write a program that uses a Scanner to read a word. The program will capitalize the first, last and middle letter of the word. [Hint: Capture the letter as a string (using the substring method) then use the toUpperCase() method.] Test this with two different inputs than shown below (one word should have an even number of letters and one word should have an odd number of letters).

Please type a word: hello

The new word is: HeLlO

Please type a word: programs

The new word is: ProGramS

/\*CSCI 1100 – Lab 7 – Exercise 6

This program will take a word and capitalize the first,

last and middle letter of the word.

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

public class E6 {

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 word

System.out.print("Please enter a word: ");

// Store this word in a variable

String word = input.nextLine();

// Calculate teh middle and the length of the word

int mid = 0, length = word.length();

// Check if the length of the word is even or odd

if (word.length()%2 == 0) {

// if even get the middle

mid = length/2;

}else{

// if odd get the middle

mid = (length/2) + 1;

}

// take the first letter capitalize it then add the rest of the word and reassign it to word

word = word.substring(0,1).toUpperCase() + word.substring(1);

// take the first half and add capitalized middle letter then add rest then assign it to word

word = word.substring(0,mid-1) + word.substring(mid-1,mid).toUpperCase() + word.substring(mid, length);

// take the whole word except the last letter then add capitalized last letter then assign to word

word = word.substring(0,length-1) + word.substring(length-1,length).toUpperCase();

// print out the result

System.out.print("The new word is: "+word);

}

}

Please enter a word: ammar

The new word is: AmMaR

Please enter a word: mihyar

The new word is: MiHyaR

**Exercise 7.** Using a for loop write a program that uses a Scanner to read a word (of any length). The program will write word backwards using a for loop. Test this with two outputs.

Please type a word: hello

hello backwards is olleh

/\*CSCI 1100 – Lab 7 – Exercise 7

This program will take a word reverse it

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

public class E7 {

public static void main(String[] args) {

String result=" ";

// Create an instance of Scanner class

Scanner input = new Scanner(System.in);

// Ask the user to enter a word

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

// Store the word in a variable

String word = input.nextLine();

// Convert the string to array of characters

char[] array = word.toCharArray();

// iterate over the array starting from the end

for (int i = array.length-1; i>=0 ;i-- ) {

// concat characters and assign it to result

result += array[i];

}

// print out the final result

System.out.print(word+" backward is "+result);

}

}

Please type a word: helllo

helllo backward is ollleh

Please type a word: computer science

computer science backward is ecneics retupmoc