Christopher Bussen

CPS 150 02 – Algorithms and Programming 1

Assignment 4

11/9/20

**Problem R4.1**

1. \*

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\*\*\*\*

1. =====

\*====

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\*\*\*==

\*\*\*\*=

1. This will print \*\*\*\*\* an infinite amount of times – will be an infinite loop because i is never incremented

**Problem R4.4**

1. while(i \* i < n){

System.out.println(i \* i);

i++;

}

1. while(i < n){

if(i % 10 == 0){

System.out.println(i);

}

i++;

}

1. while(Math.pow(2, i) < n){

System.out.println((int)Math.pow(2, i));

i++;

}

**Problem R4.13**

1. 10 times
2. 10 times
3. 10 times
4. 21 times
5. Infinite times
6. 11 times
7. 7 times

**Problem R4.19**

int n = input.nextInt();

double x = 0;

double s = 0;

while(s > 0.01){

s = 1.0 / (1 + n \* n);

n++;

x = x + s;

}

**Problem R4.22**

1. 10
2. 6
3. 3
4. 0

**Problem R4.30**

for(int i = 1; i<= height \* width; i++){

System.out.print("\*");

if(i % width == 0){

System.out.println("");

}

**Problem E4.1**

PART A RUNNING SCREENSHOT

Text

Description automatically generated

PART A CODE

/\*

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Assignment 4

SumOfEvensBetween2And100: no inputs; number

program calculates and prints the sum of all even numbers between 2 and 100

\*/

public class SumOfEvensBetween2And100 {

public static void main(String [] args){

//declare int variable for i

int i;

//declare int variable for the sum

int sum = 0;

//use for loop to add all even numbers from 2 to 100

for(i = 2; i <= 100; i +=2){

sum = sum + i;

}

//print the sum

System.out.println(sum);

}

}

PART B RUNNING SCREENSHOT

Text

Description automatically generated

PART B CODE

/\*

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Assignment 4

SumOfSquaresBetween1And100: no inputs; number

program calculates and prints the sum of all squares between 1 and 100

\*/

public class SumOfSquaresBetween1And100 {

public static void main(String [] args){

//declare int variable for i

int i = 1;

//declare int variable for the sum

int sum = 0;

//use while loop to add all squares between 1 and 100

while(i \* i <= 100){

sum = sum + (i \* i);

i++;

}

//print the sum

System.out.println(sum);

}

}

PART C RUNNING SCREENSHOT

Text

Description automatically generated

PART C CODE

/\*

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Assignment 4

PowersOf2UpTo20: no inputs; 21 numbers

program calculates and prints the powers of 2 from 0 to 20

\*/

public class PowersOf2UpTo20 {

public static void main(String [] args){

//declare int variable for i - exponent of 2

int i;

//use for loop to print powers of 2 starting from 0 and going to 20

for(i = 0; i <= 20; i++){

System.out.println(Math.pow(2, i));

}

}

}

PART D RUNNING SCREENSHOT

Graphical user interface, text

Description automatically generated

PART D CODE

/\*

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Assignment 4

SumOfOddsBetweenInputs: number number ; number

program takes in two numbers from the user and calculates then prints

the sum of all odd numbers between the two inputs

ex1: user inputs 2, 10 - program outputs 24

ex2: user inputs -19, 11 - program outputs

ex3: user inputs 101.65, 103 - program outputs error

ex4: user inputs x, y - program outputs error

ex5: user inputs 112, 10 - program outputs 0

ex6: user inputs 77, 90 - program outputs 581

\*/

import java.util.Scanner;

public class SumOfOddsBetweenInputs {

public static void main(String [] args){

//import scanner

Scanner input = new Scanner(System.in);

//prompt user to enter two integers and declare int variables for them

System.out.print("Please enter smaller integer: ");

int a = input.nextInt();

System.out.print("Please enter larger integer: ");

int b = input.nextInt();

//declare int variable for sum

int sum = 0;

//use while loop to add odds between a and b

while(a <= b){

//add to sum if odd

if(a % 2 != 0){

sum = sum + a;

}

a++;

}

//print the sum

System.out.println("The sum of odd numbers is " + sum);

}

}

PART E RUNNING SCREENSHOT

Graphical user interface, text, application

Description automatically generated

PART E CODE

/\*

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CPS 150 02

Assignment 4

SumofOddDigits: number ; number

program takes in a number from the user and calculates and prints the

sum of all of the number's odd digits

ex1: user inputs 32677 - program outputs 17

ex2: user inputs -11192 - program outputs 0 (program needs a positive integer)

ex3: user inputs 101.65 - program outputs error

ex4: user inputs x - program outputs error

ex5: user inputs 117 - program outputs 9

ex6: user inputs 2229 - program outputs 9

\*/

import java.util.Scanner;

public class SumOfOddDigits {

public static void main(String [] args){

//import scanner

Scanner input = new Scanner(System.in);

//prompt the user to enter a number and declare an int variable for it

System.out.print("Enter a positive integer: ");

int userNumber = input.nextInt();

//declare an int variable for the last digit of the number

int lastDigit = 0;

//declare an int variable for the sum of the odd digits

int sumOddDigits = 0;

//use while loop to calculate sum of odd digits

while(userNumber > 0){

lastDigit = userNumber % 10;

//add digit to sum if odd

if(lastDigit % 2 != 0){

sumOddDigits = sumOddDigits + lastDigit;

}

userNumber = userNumber / 10;

}

//print sum of odd digits

System.out.println("The sum of all odd digits is " + sumOddDigits);

}

}

**Problem E4.8**

RUNNING SCREENSHOT

Graphical user interface, text

Description automatically generated

CODE

/\*

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CPS 150 02

Assignment 4

PrintEachCharacterOnNewLine: string ; char char char char char

program takes in a string from the user and prints each character from

the string on a new line

ex1: user inputs Harry - program outputs H

a

r

r

y

ex2: user inputs eye - program outputs e

y

e

\*/

import java.util.Scanner;

public class PrintEachCharacterOnNewLine {

public static void main(String [] args){

//import scanner

Scanner input = new Scanner(System.in);

//prompt user to enter a word and declare a string variable for the value entered

System.out.print("Enter a word: ");

String word = input.nextLine();

//use a for loop to print each character of the word on a new line

for(int i = 0; i < word.length(); i++){

System.out.println(word.charAt(i));

}

}

}

**Problem E4.11**

RUNNING SCREENSHOT

Text

Description automatically generated

CODE

/\*

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CPS 150 02

Assignment 4

SyllableCounter: string ; number

program takes in a word from the user and determines and prints out

the number of syllables in the word

ex1: user inputs harry - program outputs 2

ex2: user inputs hairy - program outputs 2

ex3: user inputs hare - program outputs 1

ex4: user inputs the - program outputs 1

ex5: user inputs giannis antetokounmpo - program outputs 7

ex6: user inputs basketball- program outputs 3

\*/

import java.util.Scanner;

public class SyllableCounter {

public static void main(String [] args){

//import scanner

Scanner input = new Scanner(System.in);

//prompt the user to enter a word and declare a string variable for its value

System.out.print("Enter a word: ");

String word = input.nextLine();

//convert word to lowercase

word = word.toLowerCase();

//declare int variable for syllable count

int syllableCount = 0;

//declare boolean variable for whether or not previous character was a vowel

boolean previousVowel = false;

//use for loop to check for vowels in the word

for(int i = 0; i < word.length(); i++){

if(word.charAt(i) == 'a' || word.charAt(i) == 'e' || word.charAt(i) == 'i' || word.charAt(i) == 'o' || word.charAt(i) == 'u' || word.charAt(i) == 'y'){

//if character is a vowel and previous character was not a vowel, add 1 to syllable count

if(!previousVowel) {

syllableCount++;

}

previousVowel = true;

}

//switch previous vowel variable back to false if character isn't a vowel

else{

previousVowel = false;

}

}

//if final letter is an e, subtract a syllable from the count

if(word.charAt(word.length()-1) == 'e'){

syllableCount --;

}

//if syllable count is 0, change it to 1

if(syllableCount == 0){

syllableCount = 1;

}

//print the syllable count

System.out.println(syllableCount + " syllable(s)");

}

}

**Problem E4.23**

RUNNING SCREENSHOT

There was an error with the imported class that prevented the program from running properly, yet code was correct

CODE

import java.awt.Color;

public class IncreaseRedBy30Percent

{

public static void main(String[] args)

{

Picture pic = new Picture();

pic.load("queen-mary.png");

for (int x = 0; x < pic.getWidth(); x++)

{

for (int y = 0; y < pic.getHeight(); y++)

{

Color original = pic.getColorAt(x, y);

int red = original.getRed();

red = Math.min((int)(red \* 1.3), 255);

Color sunset = new Color(red,

original.getGreen(),

original.getBlue());

pic.setColorAt(x, y, sunset);

}

}

}

}

**Problem P4.6**

RUNNING SCREENSHOT

Text

Description automatically generated

CODE

/\*

Christopher Bussen

CPS 150 02

Assignment 4

AverageWordsInSentence: string string; number (and also reprints the strings word by word)

program takes in two sentences from the user and determines and

calculates the average number of words in each sentence

ex1: user inputs i feel tired. AND it's time for bed. - program outputs 3.5

ex2: user inputs my phone is dead, don't text. AND please turn the tv off when you leave. - program outputs 7.0

ex3: user inputs i love bunnies. AND bunnies scare me - program outputs Make sure sentence ends with period AND 1.5 (second sentence won't be counted due to missing period)

ex4: user inputs please hand me a tissue now. AND sorry, i can't quite reach them. - program outputs 6.0

\*/

import java.util.Scanner;

public class AverageWordsInSentence {

public static void main(String[] args) {

//import scanner

Scanner input = new Scanner(System.in);

//prompt the user to enter a sentence and declare a string variable for it

System.out.print("Enter the first sentence and end with a period: ");

String sentence1 = input.nextLine();

//call method for first sentence using sentence1 as input

int firstWordCount = firstSentence(sentence1);

//prompt the user to enter another sentence and declare a string variable for it

System.out.print("Enter the second sentence and end with a period: ");

String sentence2 = input.nextLine();

//call method for second sentence using sentence2 as input

int secondWordCount = secondSentence(sentence2);

//declare double variable for average words in sentence

double averageWords = (firstWordCount + secondWordCount) / 2.0;

//print average word count

System.out.println("The average amount of words in each sentence is " + averageWords + " words");

}

public static int firstSentence(String x){

//declare an int variable for word count in sentence 1

int wordCount1 = 0;

//use if statement to make sure sentence ends in period

if(x.charAt(x.length()-1) == '.') {

//use for loop to print and count words in first sentence

for (int i = 0; i < x.length(); i++) {

if (x.charAt(i) == ' ' || x.charAt(i) == '.') {

//print the word before the space

System.out.println(x.substring(0, i));

//add one to the word count

wordCount1++;

}

}

}

else{

System.out.println("Make sure sentence ends with period");

}

return wordCount1;

}

public static int secondSentence(String y){

//declare an int variable for word count in sentence 2

int wordCount2 = 0;

//use if statement to make sure sentence ends in period

if(y.charAt(y.length()-1) == '.') {

//use for loop to print and count words in second sentence

for (int i = 0; i < y.length(); i++) {

if (y.charAt(i) == ' ' || y.charAt(i) == '.') {

//print the word before the space

System.out.println(y.substring(0, i));

//add one to the word count

wordCount2++;

}

}

}

else{

System.out.println("Make sure sentence ends with period");

}

return wordCount2;

}

}