**Chapter 4 Practice exercises**

**E4.1 Write a program with loops that computes…**

1. The sum of all even number between 2 and 100 (inclusive).

**int** sum = 0;

**for** (**int** n = 2; n <= 100; n = n + 2) {

sum = sum + n;

}

System.***out***.println(sum);

1. The sum of all squares between 1 and 100 (inclusive).

**int** sum = 0;

**int** n = 1;

**while** (n <= 100) {

sum = (sum + (n\*n));

n++;

}

System.***out***.println(sum);

1. All the powers of 2 from 2^(0) to 2^(20).

**int** p = 0;

**int** sum;

System.***out***.println("2 to the power of: Is:" );

**while** (p <= 20) {

sum = (**int**) Math.*pow*(2, p);

System.***out***.printf("%18d %10d %n" , p , sum);

p++;

}

1. The sum of all odd numbers between a and b (inclusive), where a and b are inputs.

**int** sum = 0;

Scanner input = **new** Scanner(System.***in***);

System.***out***.println(

"This program calculates the sum of all the odd numbers between A (starting point) and B (Ending point) (inclusive)");

System.***out***.println("Please enter integer A:");// A is start

**int** numberA = input.nextInt();

System.***out***.println("Please enter integer B:");

**int** numberB = input.nextInt();

**for** (**int** i = numberA; i <= numberB; i++) {

**if** (i % 2 > 0) {

sum = sum + i;

}

}

System.***out***.println(sum);

1. The sum of all odd digits of an input. (For example, if the input is 32677,

the sum would be 3 + 7 + 7 = 17.)

**int** n;

**int** digit;

**int** sum = 0;

Scanner input = **new** Scanner(System.***in***);

System.***out***.print("Please enter a valid integer: ");

n = input.nextInt();

**while** (n > 0) {

digit = n % 10;

n = n / 10;

**if** (digit % 2 > 0) {

sum += digit;

}

}

System.***out***.println(

"The sum of your odd digits in your integer is: " + sum);

**E4.2 Write programs that read a sequence of integer inputs and print**

1. **The smallest and largest of the inputs.**

Scanner in = **new** Scanner(System.***in***);

System.***out***.print("Enter 2 integers: ");

**int** largest = in.nextInt();

**int** counter = 0;

**int** smallest = largest;

**while** (in.hasNextInt() && counter < 10) {

**int** input = in.nextInt();

largest = Math.*max*(largest, input);

smallest = Math.*min*(smallest, input);

counter--;

System.***out***.println("Largest: " + largest);

System.***out***.println("Smallest: " + smallest);

}

System.***out***.println("You only get 10 inputs");

System.*exit*(0);

1. **The number of even and odd inputs.**

Scanner in = **new** Scanner(System.***in***);

**int** n;

**int** evenCounter = 0;

**int** oddCounter = 0;

**int** counter = 15;

System.***out***.print("Enter integers: ");

**while** (in.hasNextInt() && counter > 0) {

n = in.nextInt();

**if** (n % 2 == 0) {

System.***out***.println("This integer is even");

evenCounter++;

counter--;

} **else** {

System.***out***.println("This integer is odd");

oddCounter++;

counter--;

}

}

System.***out***.println( "The number of even and odd integers, respectively: " + evenCounter + ", " + oddCounter);

1. **Cumulative totals. For example, if the input is 1 7 2 9, the program should**

**print 1 8 10 19.**

**int** n;

**int** sum = 0;

Scanner input = **new** Scanner(System.***in***);

System.***out***.print("Enter integers to find cumilative total: ");

**while** (input.hasNextInt()) {

n = input.nextInt();

sum = sum + n;

System.***out***.println("The cumilative total is: " + sum);

}

1. **All adjacent duplicates. For example, if the input is 1 3 3 4 5 5 6 6 6 2, the program should print 3 5 6.**

Scanner input = **new** Scanner(System.***in***);

**int** counter = 20;

**int** prevNumber = 0;

**int** currentNumber = 0;

String output = "";

**boolean** trackDuplicate = **true**;

System.***out***.println("Please enter 20 integers: ");

**while** (input.hasNextInt() && counter > 0) {

currentNumber = input.nextInt();

counter--;

**if** (currentNumber == prevNumber && trackDuplicate) {

trackDuplicate = **false**;

output += currentNumber;

output += " ";

System.***out***.println("Current duplicate string is: " + output);

} **else** **if** (currentNumber != prevNumber) {

trackDuplicate = **true**;

}

prevNumber = currentNumber;

}

System.***out***.println("Final duplicate string is: " + output);

**E4.3 Write programs that read a line of input as a string and print**

1. **Only the uppercase letters in the string.**