# **Homework**

# **Grade 11 Review 2 – Selection, Repetition**

1. **SortThreeLetters.java** Write a program that prompts for three lower case letters. If all inputs are valid (lower case letters), output the three letters in alphabetical order, otherwise, output an error message.

| /\*  \* Program name: SortThreeLetters.java  \*  \* By: Lucas Chow (Last edited: 2022-09-19)  \*  \* ICS4U1 - 01\_Gr11Review  \*  \*  \* This program prompts the user for a 3 letters; ensuring they are  \* all letters, then returns the letters in alphabetical order  \*  \*/  //importing scanner  import java.util.Scanner;  public class SortThreeLetters  {      //metod to check if input is a char; returns boolean if input is an alphabetical char  public static boolean isChar(String input)  {  boolean isChar = false;  input = input.toLowerCase();  if ((int)input.charAt(0) >= 97 && (int)input.charAt(0) <= 122)  {  isChar = true;  }    if (input.length() > 0)  {  isChar = false;  }    return isChar;    }    //start of main method  public static void main(String[] args) {  Scanner sc = new Scanner(System.in);    String input;  char let1;  char let2;  char let3;      //initializing the 1st letter/character    let1 = '0';  do {  System.out.print("Enter the first letter: ");    input = sc.nextLine();    if (!isChar(input))  {  System.out.println("That is not a letter; enter a letter");  }  else  {  let1 = input.charAt(0);  }  } while (!isChar(input));      //initializing the 2nd letter/character    let2 = '0';  do {  System.out.print("Enter the second letter: ");    input = sc.nextLine();    if (!isChar(input))  {  System.out.println("That is not a letter; enter a letter");  }  else  {  let2 = input.charAt(0);  }  } while (!isChar(input));        //initializing the 3rd letter/character    let3 = '0';  do {  System.out.print("Enter the third letter: ");    input = sc.nextLine();    if (!isChar(input))  {  System.out.println("That is not a letter; enter a letter");  }  else  {  let3 = input.charAt(0);  }  } while (!isChar(input));    //Comparing the 1st character to the 2nd and 3rd character      //comparing the values inputed and sorting them by their integer equivalents  if (let1 <= let2)  {  if (let3 <=let2)  {  if (let1 <= let3)  {  System.out.printf("%c %c %c",let1,let3,let2);  }  else  {  System.out.printf("%c %c %c",let3,let1,let2);  }  }  else  {  System.out.printf("%c %c %c",let1,let2,let3);  }    }  else  {  if (let2 >= let3)  {  System.out.printf("%c %c %c",let3,let2,let1);  }  else  {  if (let1 >= let3)  {  System.out.printf("%c %c %c",let2,let3,let1);  }  else  {  System.out.printf("%c %c %c",let2,let1,let3);  }  }  }      //closing the scanner  sc.close();  }  } |
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1. **LeastTwoPower.java** Write a program that reads a positive integer and then finds the smallest power of two that is greater than or equal to the number that are read. For example, if the program reads the value 25, it should note that 32 = 25 is the smallest power of two greater than or equal to 25.

| /\*  \* Program name: LeastTwoPower.java  \*  \* By: Lucas Chow (Last edited: 2022-09-19)  \*  \* ICS4U1 - 01\_Gr11Review  \*  \* This program will prompt the user for a postitive integer, and then finds the  \* smallest power of two greater or equal to the inputed number  \*  \*/  import java.util.Scanner;  public class LeastTwoPower  {  public static void main(String[] args)  {  //declaring variables  int userInt, powerOfTwo;  Scanner sc = new Scanner(System.in);    //prompting user for a number  System.out.print("Please enter a positive integer: ");  userInt = sc.nextInt();  sc.nextLine();    //calculating the lowest power of two greater or equal to the number  powerOfTwo = 1;  while (powerOfTwo < userInt)  {  powerOfTwo = powerOfTwo\*2;    }    //outputting the power of two that fits the parameters.  System.out.println(powerOfTwo);    //closing scanner  sc.close();  }  } |
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1. **Paper.java**: Suppose that a large piece of paper with an area of 1.0m2 and a thickness of 0.090 mm is cut in half and the two pieces are stacked, one on top of the other. Suppose further that the process of cutting in half and stacking is repeated over and over again. Write a program to find both the thickness of the pile and the area of each piece after the procedure has been carried out forty times.

| /\*  \* Program name: Paper.java  \*  \* By: Lucas Chow (Last edited: 2022-09-19)  \*  \* ICS4U1 - 01\_Gr11Review  \*  \* This program supposes a large piece of paper with area of 1.0 m2  \* and a thickness of 0.090 mm, being cut in half and the two pieces  \* stacked on top of each other, 40 times over, and prints out  \* the Round #, area in m2, and thickness in mm  \*/  //importing scanenr  import java.util.Scanner;  public class Paper  {  public static void main(String[] args)  {  //declaring variables  double area;  double thickness;  Scanner sc = new Scanner(System.in);    area = 1;  thickness = 0.09;    //prompting user  System.out.println("Round # Area Thickness");  for (int i=0; i<=40; i++)  {  System.out.printf("%-2d %-4.5f m2 %.2f mm\n",i,area/(Math.pow(2, i)),thickness\*(Math.pow(2, i)));  }    //closing scanner  }  } |
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1. **Pythagorean.java**: Three positive integers a, b, and c with a < b < c form a Pythagorean triplet if a2 + b2 = c2. For example 3, 4, 5 form a Pythagorean triplet since 32 + 42 = 52. Write a program that first prompts the user for a positive integer and then finds and prints all Pythagorean triplets whose largest member is less than or equal to that integer.

| /\*  \* Program name: Pythagorean.java  \*  \* By: Lucas Chow (Last edited: 2022-09-19)  \*  \* ICS4U1 - 01\_Gr11Review  \*  \* This program prompts the user for a positive integer and then prints out all  \* Pythagorean triplets with c <= user input in form a^2 + b^2 = c^2, a, b and c are positive integers  \*/  //importing scanner  import java.util.Scanner;  public class Pythagorean  {  public static void main(String[] args)  {  //declaring variables  int userInt;  Scanner sc = new Scanner(System.in);    //prompting user for a positive integer  System.out.print("Enter a positive integer: ");  userInt = sc.nextInt();  sc.nextLine();    //prints out the title  System.out.println(" a^2 + b^2 = c^2");  System.out.println("\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\n");    //prints out the primitive Pythagorean triples all numbers <= userInput  for (int i = 1; i <= userInt; i++)  {  for (int a = 1; a <= i; a++)  {  for (int b = 1; b <= a; b++)  {  if (a\*a + b\*b == i\*i)  {  System.out.printf("%3d^2 + %3d^2 = %3d^2\n",b,a,i);  }  }  }  }    //closing scanner  sc.close();  }  } |
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