**OOPs**

**Question 1:**

Write a java program to check whether a year is a leap year or not.

A year is a leap year if the following conditions are satisfied

1. The year is multiple of 400.
2. The year is multiple of 4 and not multiple of 100

**Solution**

package com.greatlearning.mentorsession.week1;

import java.util.Scanner;

class LeapYearChecker {

// using static method

static void isLeapYear(int year) {

// leap year is perfectly divisible by 400

if (year % 400 == 0) {

System.out.println("Leap year");

}

// not a leap year if divisible by 100 and not divisible by 400

else if (year % 100 == 0) {

System.out.println("Not a leap year");

}

// leap year if divisible by 4 and not divisible by 100

else if (year % 4 == 0) {

System.out.println("Leap year");

}

// rest all years are non leap years

else {

System.out.println("Not a leap year");

}

}

public static void main(String[] args) {

Scanner sc = new Scanner(System.in);

System.out.println("Enter year to check for leap Year: ");

int year = sc.nextInt();

if (year >= 0) {

isLeapYear(year);

} else

System.out.println("Invalid Input");

sc.close();

}

}

**Question 2:**

Write a java program to print the pattern of stars in a conical shape.

The first row should have 1 start, the second row should have 2 starts,...etc so that the pattern looks like a cone (inverted V). Use parameterized constructor

**Solution:**

package com.greatlearning.mentorsession.week1;

import java.util.Scanner;

public class PyramidPattern {

public PyramidPattern(int height) {

System.out.println("\nThe pattern is:");

// level check

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

// adding space before printing

for (int j = height - i; j > 1; j--) {

System.out.print(" ");

}

// printing the pattern

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

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

}

// going to new line

System.out.println();

}

}

public static void main(String[] args) {

Scanner sc = new Scanner(System.in);

System.out.print("Enter height of the pattern as positive integer only:");

int height = sc.nextInt();

if (height > 0) {

new PyramidPattern(height); // using constructor

} else

System.out.println("Invalid input");

sc.close();

}

}

**Sample Output:**

Enter height of the pattern as positive integer only:5

The pattern is:

\*

\* \*

\* \* \*

\* \* \* \*

\* \* \* \* \*

**Question 3:**

Write a java program to print Multiplication Table till 20 of user choice. Use static keyword for variable ‘n’ in class and final keyword for method logic. Make sure that the program accepts negative and floating values also.

**Solution:**

package com.greatlearning.mentorsession.week1;

import java.util.Scanner;

public class Tables {

Scanner sc = new Scanner(System.in);

static float n;

final void sam() { // final cannot be used for constructors as they are not members of class

System.out.print("Enter the nth table to print.");

n = sc.nextFloat();

for(int i =1;i<=10;i++) {

System.out.println(n+" x "+i+" = "+ n\*i);

}

}

}

**Question 4:**

Write a java program to implement Studly Caps concept

1. The ASCII value range of a-z, A-Z and 0-9 using a method.
2. Accept string from user and convert it to studly caps (Alternate capitals) using basic method with no return type.
3. The pattern of the studly caps is that all even positions of the string should have capital letters and odd positions of the string should have small letters if a letter is found.
4. Leave the other characters in the string as it is.
5. Print the output

**Solution:**

import java.util.Scanner;

public class StudlyCaps extends LeapYearChecker { // blue print of object

Scanner sc = new Scanner(System.in);

public StudlyCaps() { // default constructor

/\*

\* Method 1: Assigning character to integer variable 'c' 'c' stores ASCII value

\* of the character automatically. Can also be used to find ASCII value of any

\* character.

\*/

int ascii\_a = 'a';

int ascii\_z = 'b';

int ascii\_0 = '0';

int ascii\_9 = '9';

/\*

\* Method 2: Assigning character to character variable 'ch' 'ch' stores ASCII

\* value of the character automatically.

\*/

char ch\_A = 'A';

char ch\_Z = 'B';

// casting or converting a character variable value to integer variable value.

int ascii\_A = (int) ch\_A;

int ascii\_Z = (int) ch\_Z;

System.out.println("Ascii Value is an integer value assigned to every letter, number, symbol on the keyboard.\n"

+ "The letters or symbols are converted to these numbers, which are further converted to machine language (0 & 1)\n");

System.out.println("Ascii range of a-z is: " + ascii\_a + ", " + ascii\_z + " respectively");

System.out.println("Ascii range of A-Z is: " + ascii\_A + ", " + ascii\_Z + " respectively");

System.out.println("Ascii range of 0-9 is: " + ascii\_0 + ", " + ascii\_9 + " respectively");

}

public void convertTextToStudlyCaps() {

String text, convertedtext = "";

int ascii;

System.out.print("\nEnter text. You can include symbols and numbers also: ");

text = sc.nextLine();

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

ascii = text.charAt(i);

if (i % 2 != 0) {

if (ascii >= 97 && ascii <= 122) {

ascii -= 32;

convertedtext += (char) ascii;

} else if (ascii >= 65 && ascii <= 90) {

convertedtext += (char) ascii;

} else

convertedtext += (char) ascii;

}

if (i % 2 == 0) {

if (ascii >= 65 && ascii <= 90) {

ascii += 32;

convertedtext += (char) ascii;

} else if (ascii >= 97 && ascii <= 122) {

convertedtext += (char) ascii;

} else

convertedtext += (char) ascii;

}

}

System.out.println("\nStudly Caps is: " + convertedtext);

}

public static void main(String[] args) {

// object creation

// Initializing the object. (Instance of class)

StudlyCaps studlycaps;

/\*

\* Instantiating the class. This implements the default and parameterized

\* constructors based on the input arguments.

\*/

studlycaps = new StudlyCaps();

// calling method using object convertTextToStudlyCaps()

studlycaps.convertTextToStudlyCaps();

}

}

-------------------------------------------------- END OF WEEK 1 ----------------------------------------------------