Name of the Course : Complete Java SE8 Developer Bootcamp

Level : Moderate

Tool Stack : Java8 and Junit4

Problem Statement : Provide a code solution to convert a Roman number to Decimal number using Map, static block etc features.

Description : The Historical Society has to handle various old documents, parchments etc. The Society faces one problem, most of documents numeric figures are in Roman i.e. I,V,X etc. Sometimes it is very difficult in case of complex Roman number to translate into modern decimal number. You are requested to help the society to develop a Java application that will convert any Roman number to a decimal number.

Create only one class Main with the followings:-

1. private static member data : private static Map <Character ,Integer> numberMap.
2. static block to initialize the Map with Roman number as key and decimal figure as value. Roman numbers are

I-1,V-5,X-10,L-50,C-100,D-500,M-1000.

3. public static int convertRomanToDecimal(String romanNumber): It accepts any roman number in any case then converts to corresponding decimal figure and returns it.

4. public static void main(String arg[]): It accepts any roman number in any case from the user, invokes the convertRomanToDecimal() and finally displays the corresponding decimal figure.

Code:

**import** java.util.HashMap;

**import** java.util.Map;

**import** java.util.Scanner;

**public** **class** Main {

**private** **static** Map<Character,Integer> *numberMap*=**new** HashMap<>();

**static**

{

*numberMap*.put('I',1);

*numberMap*.put('V',5);

*numberMap*.put('X',10);

*numberMap*.put('L',50);

*numberMap*.put('C',100);

*numberMap*.put('D',500);

*numberMap*.put('M',1000);

}

**public** **static** **int** convertRomanToDecimal(String romanNumber)

{

**int** decimalNumber=0;

romanNumber=romanNumber.toUpperCase();

**for**(**int** i=0;i<romanNumber.length();i++)

{

**char** ch=romanNumber.charAt(i);

**int** x=*numberMap*.get(ch);

**if**(i==0)

decimalNumber=decimalNumber+x;

**if**(i<(romanNumber.length()-1))

{

**int** j=i+1;

**char** sh=romanNumber.charAt(j);

**int** y=*numberMap*.get(sh);

**if**(x>=y)

decimalNumber=decimalNumber+y;

**else** **if** (x<y)

decimalNumber=decimalNumber+y-x-x;

}

}// end of for loop

**return** decimalNumber;

}

**public** **static** **void** main(String[] args) {

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

System.***out***.println("Enter a Roman number:");

String romanNumber=scanner.nextLine();

System.***out***.println(*convertRomanToDecimal*(romanNumber));

}

}

Junit Testing

**import** **static** org.junit.Assert.\*;

**import** org.junit.Test;

**public** **class** MainTest {

@Test

**public** **void** testConvertRomanToDecimal() {

*assertEquals*(14,Main.*convertRomanToDecimal*("XIV"));

*assertEquals*(16,Main.*convertRomanToDecimal*("xvi"));

*assertEquals*(2650,Main.*convertRomanToDecimal*("mmdcl"));

*assertEquals*(2449,Main.*convertRomanToDecimal*("MMCDIL"));

}

}

Test Data1

Enter a Roman number:

XIV

14

Test Data2

Enter a Roman number:

xvi

16

Test Data3

Enter a Roman number:

mmdcl

2650

Test Data4

Enter a Roman number:

MMCDIL

2449

Learning outcome: Participant could able to learn how to use static block and java.util.Map with programming logic .