Connecting Intelligence

Institute of Computer Engineering Technology

iCET Certified Developer

COURSE WORK

Assignement	Programming Fundamentals
Batch No	iCM 111
Name	Iteration with JAVA Loops
Ass. Date	31st August 2024

iCALC Number Converter System

This project involves creating a Java application for number conversion. The application will implement the following use cases

When you run the application, you should come up with something similar to the following Command Line Interface (CLI), where the user can enter an option number that he wants to execute. This will be the Home Page of the application that you will be developing.

Figure 1 – Home Page

01. Decimal Converter (Demo)

This program takes a positive decimal number as input and converts it to its equivalent binary, octal, and hexadecimal representations.

When the user inputs a decimal number system should validate the number, which means the number should be positive and the user input number can only contain a number between 0 and 9. If user input invalid number system should display a massage that "invalid input…" and ask from user that input number again. If user input 'Y', user can input number again and if user said 'N' system should load homepage(Figure 3).

When user input number in valid format system should display output and asked from user that "Do you want to go to homepage". If user input 'Y', user can go to home page and if user said 'N' system should exit(Figure 2).

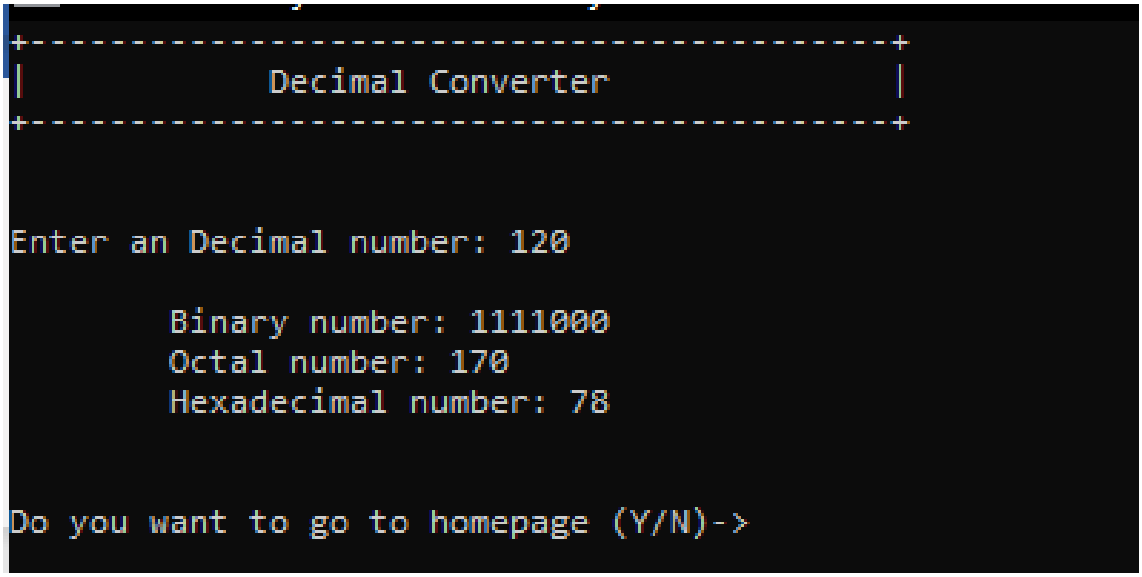

Figure 2 – Decimal Converter

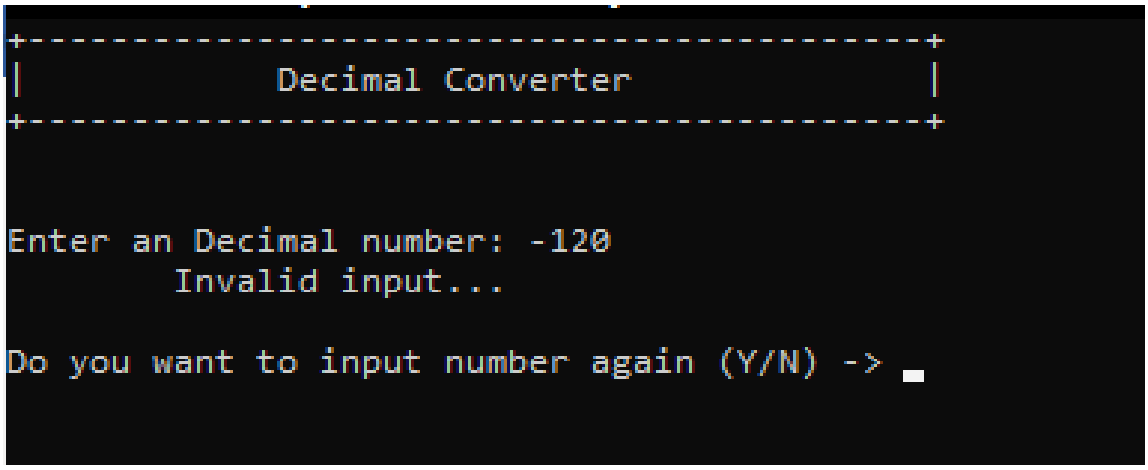

Figure 3 – Invalid Input

02. Binary Converter (Demo)

The system prompts the user to enter a binary number and then converts it to its decimal, octal, and hexadecimal equivalents. (Figure 4).

Similar to the previous implementation, the system will validate the user input to ensure it only contains the digits 0 and 1. (Figure 5).

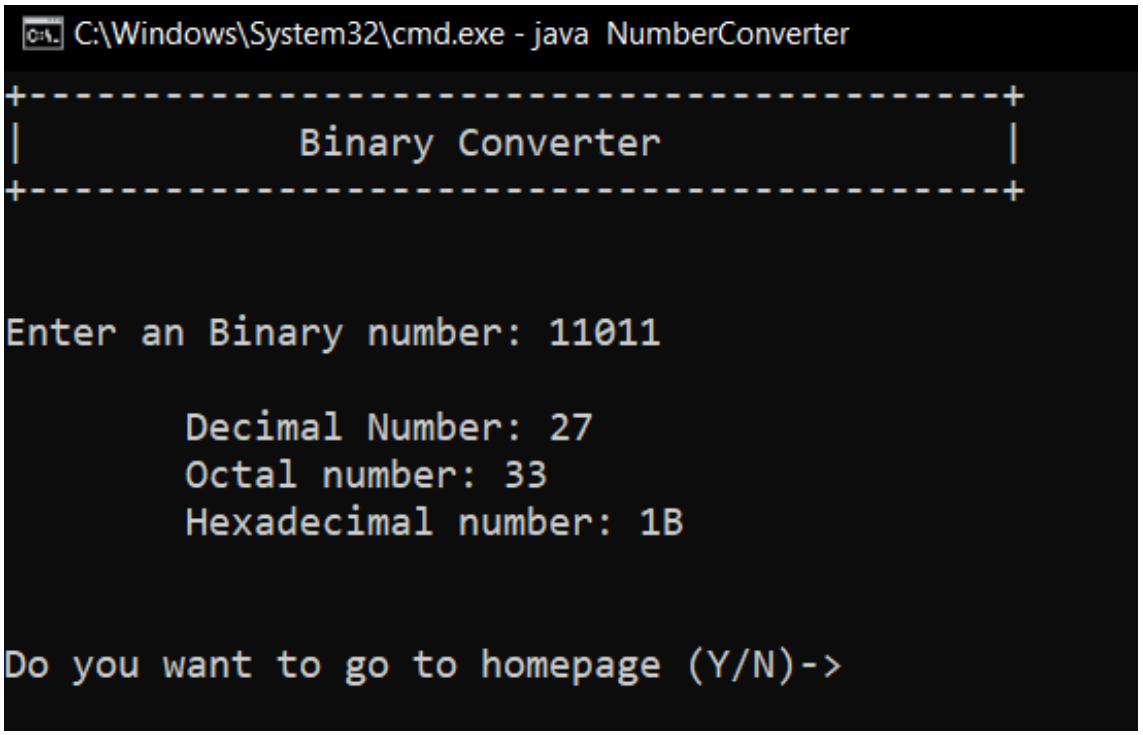

Figure 4 – Binary Converter

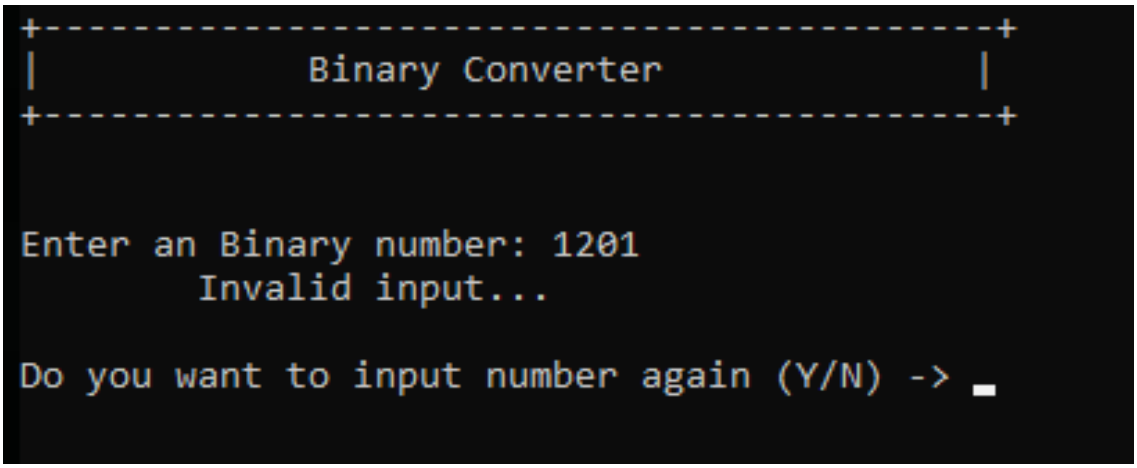

Figure 5 – Invalid Input

03. Octal Converter (Demo)

The system prompts the user to enter an octal number. The system then converts the valid octal number to its decimal, binary, and hexadecimal equivalents (Figure 6).

Similar to the previous validation, the system ensures the user input only contains digits between 0 and 7 (Figure 7).

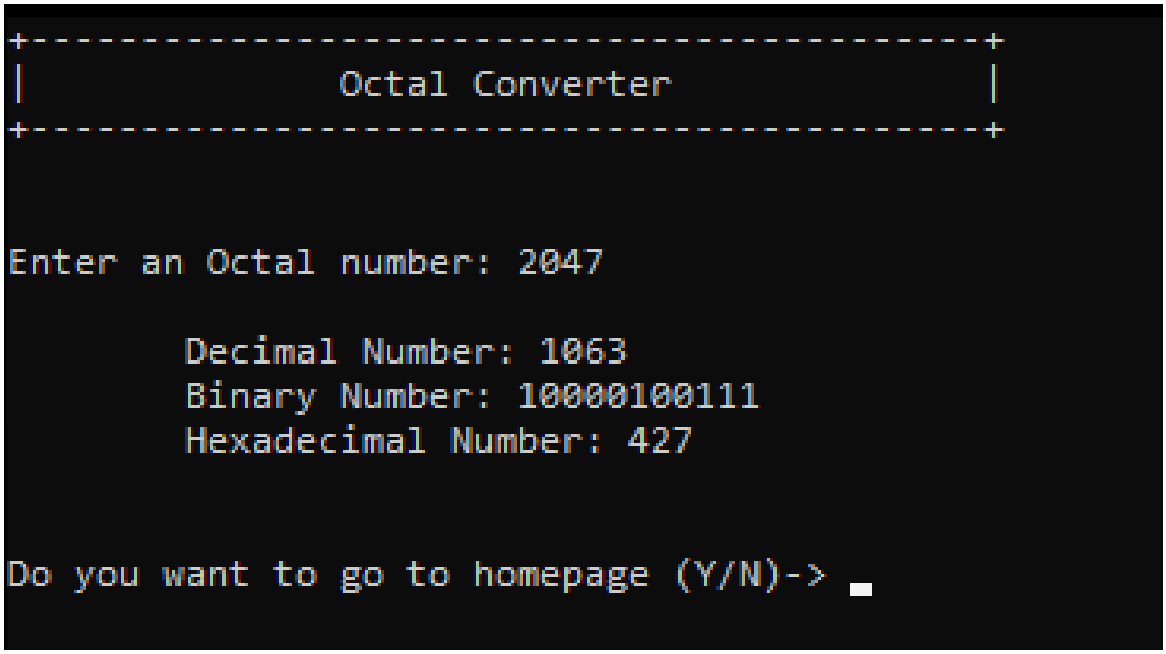

Figure 6 – Octal Converter

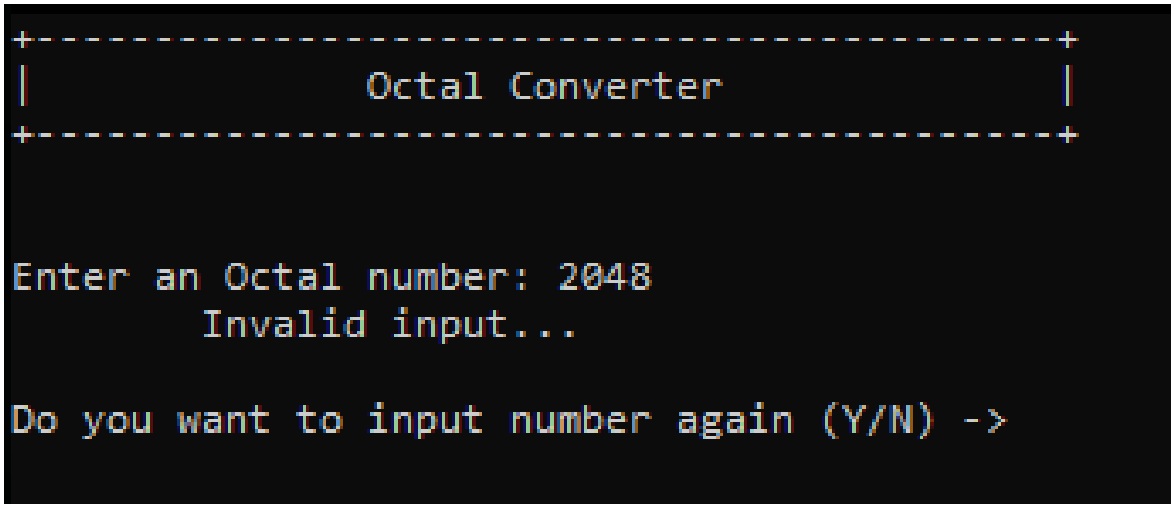

Figure 7 – Invalid Input

04. Hexadecimal Converter (Demo)

The system prompts the user to enter a hexadecimal number. Upon valid input, the system converts the hexadecimal number to its decimal, binary, and octal equivalents (Figure 8).

As with previous validations, the system ensures the user input only contains valid hexadecimal digits: numbers between 0 and 9, and uppercase or lowercase letters A through F (Figure 9).

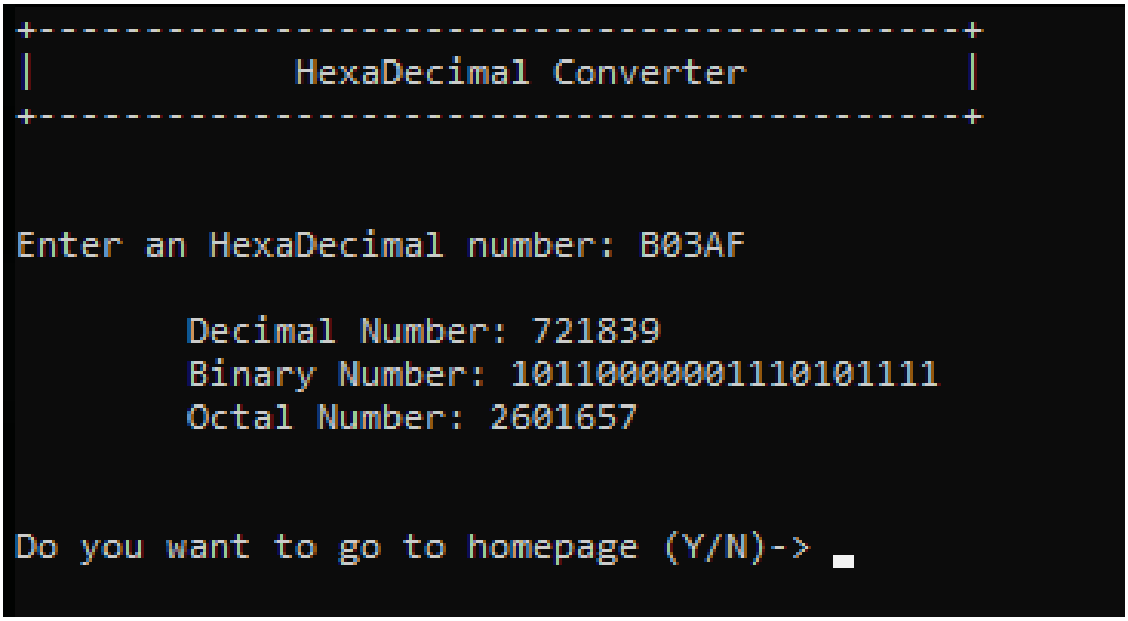

Figure 8 –Hexadecimal Converter

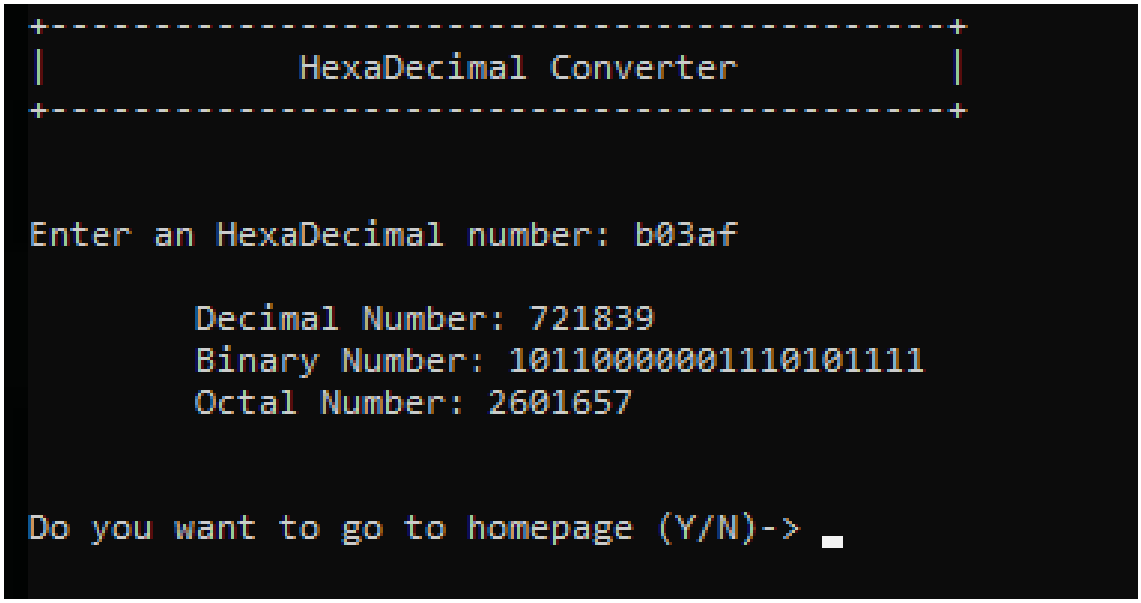

Figure 9 – Hexadecimal Converter

05. Roman Number Converter (Demo)

The Roman numeral converter offers two functionalities:

I. Decimal Number to Roman Number Converter

II. Roman Number to Decimal Number Converter

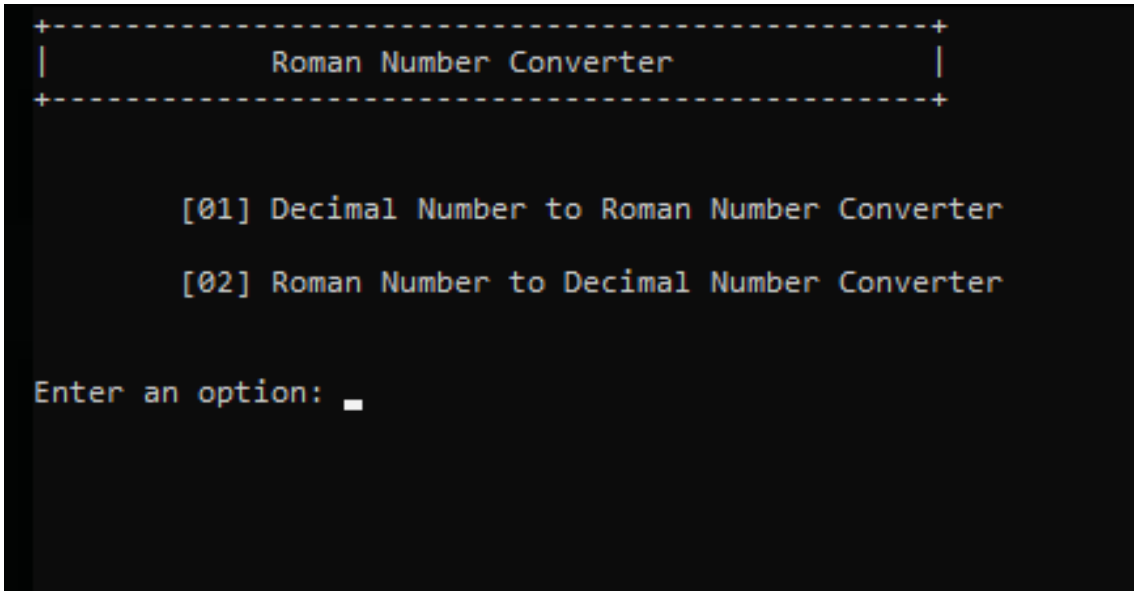

Figure 10 – Roman Number Home Page

[01] Decimal Number to Roman Number Converter

The system should output the roman number of the decimal number entered by the user(Figure 11). Again here, the number should be validated like previously.

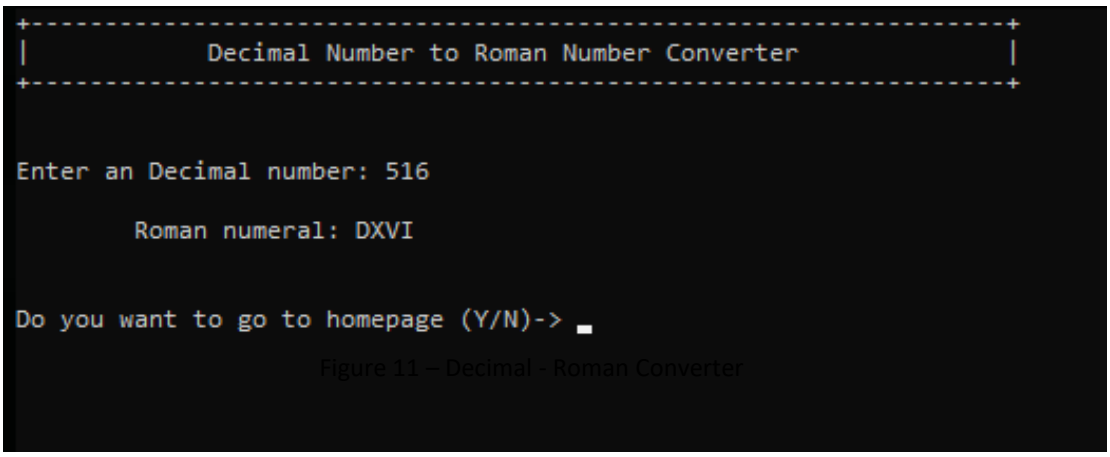

Figure 11 – Decimal Number to Roman Number Converter

You can study how to convert decimal numbers to Roman numbers in the following example. For further study, Roman Numerals are given on pages 9 and 10.

Example:- 516 = 500 + 10 + 5 + 1
D + X + V + I
DXVI

[02] Roman Number to Decimal Number Converter

The system should output the roman number of the decimal number entered by the user(Figure 12).

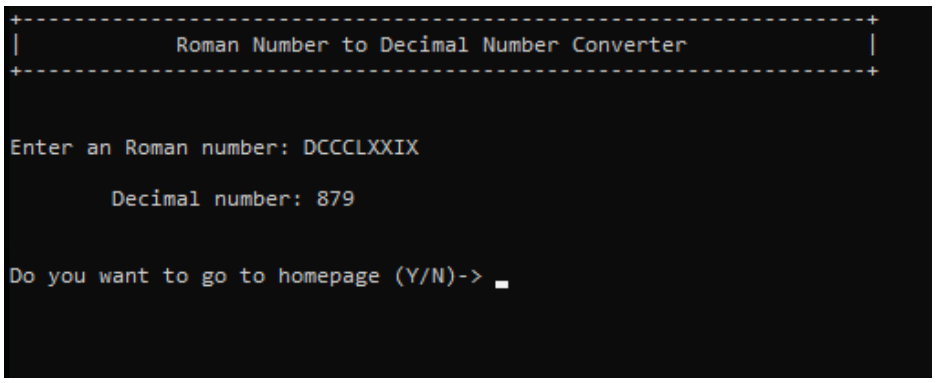

Figure 12 – Roman - Decimal Converter

You can study how to convert decimal number to roman number in the following example. For further study, Roman Numerals are given on pages 9 and 10.

Example:- 879 = 500 + 100 + 100 + 100 + 50 + 10 + 10 + (10-1)
D + C + C + C + L + X + X + (X-I)
D + C + C + C + L + X + X + IX
DCCCLXXIX

Number	Roman numeral	Calculation
0	not defined	
1	I	1
2	II	1+1
3	III	1+1+1
4	IV	5-1
5	V	5
6	VI	5+1
7	VII	5+1+1
8	VIII	5+1+1+1
9	IX	10-1
10	X	10
11	XI	10+1
12	XII	10+1+1
13	XIII	10+1+1+1
14	XIV	10-1+5
15	XV	10+5
16	XVI	10+5+1
17	XVII	10+5+1+1
18	XVIII	10+5+1+1+1
19	XIX	10-1+10
20	XX	10+10
21	XXI	10+10+1
22	XXII	10+10+1+1
23	XXIII	10+10+1+1+1
24	XXIV	10+10-1+5
25	XXV	10+10+5
26	XXVI	10+10+5+1
27	XXVII	10+10+5+1+1
28	XXVIII	10+10+5+1+1+1
29	XXIX	10+10-1+10
30	XXX	10+10+10
31	XXXI	10+10+10+1
32	XXXII	10+10+10+1+1
33	XXXIII	10+10+10+1+1+1
34	XXXIV	10+10+10-1+5
35	XXXV	10+10+10+5
36	XXXVI	10+10+10+5+1
37	XXXVII	10+10+10+5+1+1
38	XXXVIII	10+10+10+5+1+1+1
39	XXXIX	10+10+10-1+10
40	XL	-10+50
41	XLI	-10+50+1
42	XLII	-10+50+1+1
43	XLIII	-10+50+1+1+1
44	XLIV	-10+50-1+5
45	XLV	-10+50+5
46	XLVI	-10+50+5+1
47	XLVII	-10+50+5+1+1
48	XLVIII	-10+50+5+1+1+1
49	XLIX	-10+50-1+10
50	L	50
51	LI	50+1
52	LII	50+1+1
53	LIII	50+1+1+1
54	LIV	50-1+5
55	LV	50+5
56	LVI	50+5+1
57	LVII	50+5+1+1
58	LVIII	50+5+1+1+1
59	LIX	50-1+10
60	LX	50+10
61	LXI	50+10+1
62	LXII	50+10+1+1
63	LXIII	50+10+1+1+1
64	LXIV	50+10-1+5
65	LXV	50+10+5
66	LXVI	50+10+5+1
67	LXVII	50+10+5+1+1
68	LXVIII	50+10+5+1+1+1
69	LXIX	50+10-1+10
70	LXX	50+10+10
71	LXXI	50+10+10+1
72	LXXII	50+10+10+1+1
73	LXXIII	50+10+10+1+1+1
74	LXXIV	50+10+10-1+5
75	LXXV	50+10+10+5
76	LXXVI	50+10+10+5+1
77	LXXVII	50+10+10+5+1+1
78	LXXVIII	50+10+10+5+1+1+1
79	LXXIX	50+10+10-1+10
80	LXXX	50+10+10+10

81	LXXXI	50+10+10+10+1
82	LXXXII	50+10+10+10+1+1
83	LXXXIII	50+10+10+10+1+1+1
84	LXXXIV	50+10+10+10-1+5
85	LXXXV	50+10+10+10+5
86	LXXXVI	50+10+10+10+5+1
87	LXXXVII	50+10+10+10+5+1+1
88	LXXXVIII	50+10+10+10+5+1+1+1
89	LXXXIX	50+10+10+10-1+10
90	XC	100-10
91	XCI	100-10+1
92	XCII	100-10+1+1
93	XCIII	100-10+1+1+1
94	XCIV	100-10-1+5
95	XCV	100-10+5
96	XCVI	100-10+5+1
97	XCVII	100-10+5+1+1
98	XCVIII	100-10+5+1+1+1
99	XCIX	100-10-1+10
100	C	100

100	C	100
200	CC	100+100
300	CCC	100+100+100
400	CD	500-100
500	D	500
600	DC	500+100
700	DCC	500+100+100
800	DCCC	500+100+100+100
900	CM	1000-100
1000	M	1000

Procedure for submission:

- A demo video is provided to help you understand the expected functionality better. This video may also clarify any doubts you encounter during development.
- Complete the Java code for this system.
- Upload your code file (.java) without renaming it to the designated submission platform before the deadline.
  NOTE: JAVA codes with screen shots/.png files are not valid. ONLY (.java) files are valid.