QUIZ#1: Introduction to Java, Selection and Repetition (5%)

CSC102 Introduction to Programming (1/2024)

4 September 2024

Q1: Add with Next Five

Given an integer value a, return the sum between a and the next five integer values greater than a. However, when any of the next five integer value is divisible by 13, subtract the number instead. For example, if a = 10, the method will return 10+11+12***-13***+14+15, which is 49.

Test Cases:

Input	Output
10	49
-23	-123
26	171
83	513
136	831
68	423
102	419
60	245

Q2: Day of the Week

Zeller's congruence is an algorithm developed by Christian Zeller to calculate the data of the week. The formula is

$$h = \left(q + \frac{26(m+1)}{10} + k + \frac{k}{4} + \frac{j}{4} + 5j\right) \% 7$$

where:

- **h** represents the day of the week (0: Saturday, 1: Sunday, 2 Monday, 3: Tuesday, 4: Wednesday, 5: Thursday, 6: Friday).
- **q** represents the day of the month.
- **m** represents the month (3: March, 4: April, ..., 12: December). January and February are counted as months 13 and 14 of the previous year.
- **j** represents the century (i.e., year divided by 100).
- **k** represents the year of the century (i.e., year mod 100).

Note that the divisions in the formula are integer divisions. Write a Java program that asks the user to input a year, month, and day of the month, and then displays the corresponding day of the week.

Test Cases:

Input	Output
2024 8 28	Wednesday
2015 1 25	Sunday
2012 5 12	Saturday
2030 1 3	Thursday
1980 12 19	Friday

Q3: Basic Lottery Checker

Thai lottery ticket has 6 digits as shown in the figure

Prizes are awarded based on exact matching of numbers, with varying tiers for different matches.

There are some famous prizes such as 1st prize that match all digits on the ticket worth 6 million baht, 3-digit match at the front and the back worth 4000 baht and 2-digit match at the back worth 2000 baht.

For this round

- The first prize is 199606
- The 3-digits front is 173 or 220
- The 3-digits back is 388 or 094
- The 2-digits is 94

INPUT: A number on lottery ticket

OUTPUT: An amount of prize if there is no prize win, print 0

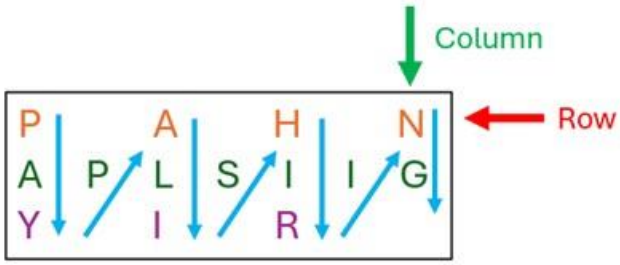
Test Cases:

Input	Output
199606	6000000
173606	4000
199388	4000
199394	2000
199389	0
386094	6000
199605	0
245094	6000
173388	8000
220594	6000
111111	0
173094	10000
890223	0
878794	2000

Q4: Zigzag Conversion

Given a string and an integer, write a program that converts the string into a zigzag pattern on a given number of rows. The string should be read row by row to produce the final converted string. The program should take a string and an integer as input. The string should be arranged in a zigzag pattern across the specified number of rows. For example, given the string “PAYPALISHIRING” and numRows = 3, the zigzag pattern would be:

Answer:



Output: PAHNAPLSIIGYIR

Test Cases:

Input	Output
PAYPALISHIRING 3	PAHNAPLSIIGYIR
HELLO 1	HELLO
Hello, World! 3	Hoo!el,Wrdl l
TIVEHZGNETSIAZORNTSSACSOIGI 3	THEANAIIEZNTIZRTSCOGVGSOSSI
A 1	A