DIRECTIONS:

- You are given the following problems or scenarios below.
- Your program must be unique, neat, efficient, and free from bugs or errors.
- Submit the whole **BlueJ Project** folder on or before **December 30** thru my email address: vgperdido@nvsu.edu.ph. Attach it as .zip file. Email **subject** should be: **Final-Term-Project**.

BE UNIQUE! WORK INDEPENDENTLY! DO NOT CHEAT!

Subject:	**CSPC 3 (Object-Oriented Programming)**
Topics Covered:	Java Building Blocks, Built-in Methods and Control Structures
Intended Learning Outcome:	The students should be able to provide program solutions to machine problems involving the use of built-in methods available in the Java API. Also, students should be able to apply all the fundamental concepts of Java (variables, data types, operators, expressions) including the different types of control structures.

LAB ACTIVITY Description

1. Class Name: ExtractingDigits

Write a program to extract each digit from an `int`, in the reverse order. For example, if the `int` is 1542, the output shall be "2,4,5,1", with a comma separating the digits.

Hints: Use `n % 10` to extract a digit; and `n = n / 10` to discard the last digit.

```
int n = ....;
while (n > 0) {
   int digit = n % 10;  // Extract the last digit
   ......
   .....
   n = n / 10;          // Drop last digit and repeat the loop
}
```

2. ClassName: CozaLozaWoza

Write a program called **`CozaLozaWoza`** which prints the numbers 1 to 110, 11 numbers per line. The program shall print "Coza" in place of the numbers which are multiples of 3, "Loza" for multiples of 5, "Woza" for multiples of 7, "CozaLoza" for multiples of 3 and 5, and so on. The output shall look like:

```
1 2 Coza 4 Loza Coza Woza 8 Coza Loza 11
Coza 13 Woza CozaLoza 16 17 Coza 19 Loza CozaWoza 22
23 Coza Loza 26 Coza Woza 29 CozaLoza 31 32 Coza
......
```

Hints:

```
public class CozaLozaWoza {   // saved as "CozaLozaWoza.java"
   public static void main(String[] args) {
      int lowerbound = 1;
      int upperbound = 110;
```

```
        for (int number = lowerbound; number <= upperbound; ++number)
{
          // Print "Coza" if number is divisible by 3
          if (......) {
             System.out.print("Coza");
          }
          // Print "Loza" if number is divisible by 5
          if (......) {
             System.out.print(.....);
          }
          // Print "Woza" if number is divisible by 7
          ......
          // Print the number if it is not divisible by 3, 5 and 7
          if (......) {
             ......
          }
          // Print a newline if number is divisible by 11; else print
a space
          if (......) {
             System.out.println();
          }
       }
    }
}
```

TRY: Modify the program to use nested-if (`if ... else if ... else if ... else`) instead.

3. Class Name: PalindromicWord

A word that reads the same backward as forward is called a *palindrome*, e.g., "mom", "dad", "racecar", "madam", and "Radar" (case-insensitive). Write a program called `TestPalindromicWord`, that prompts user for a word and prints `""xxx" is|is not a palindrome"`.

Hints: Read in a word and convert to lowercase via `in.next().toLowercase()`.

A phrase that reads the same backward as forward is also called a palindrome, e.g., "Madam, I'm Adam", "A man, a plan, a canal - Panama!" (ignoring punctuation and capitalization). Modify your program (called `TestPalindromicPhrase`) to test palindromic phrase.

Hints: Read in the lowercase phrase via `in.nextLine().toLowercase()`. Maintain two indexes, `forwardIndex` and `backwardIndex`, used to scan the phrase forward and backward.

4. Class name: HealthChecker

Write a menu driven program to compute and to display the ounce and caffeine intake of a costumer. The user is allowed to select the type of energy drink, and number of bottles. Caffeine intake is computed as caffeine per bottle * number of bottles. Display “Check you

health" if caffeine intake exceeds to 5000, otherwise display "Live Healthy". The caffeine intake is determined using the following table:

Energy Drinks	Service Size/bottle	Caffeine(mg)
[1] Spike shooter	8.4oz	300
[2] Cocaine	8.4oz	288
[3] Monster Energy	16oz	160
[4] Full Throttle	16oz	144
[5] Enviga	12oz	100
[6] Tab Energy	10.5oz	95
[7] Red Bull	8.3oz	83
[8] SoBe No Fear	8oz	83
[9] Amp	8.4oz	74

Sample Output Dialogue:

```
========= MAIN MENU ========
#                          #
#     [1] Enter Data       #
#     [2] Select Drink           #
#     [3] Compute Caffeine       #
#     [4] Print            #
#     [5] Exit             #
#                          #
============================

Enter your choice: 1
Enter your name: Shayne

Enter your choice: 2
Enter Drink: 1

Enter your choice: 3
No. of Bottles: 10
Caffeine Intake: 3000
Remarks: Check your Health

Enter your choice: 4
Shayne Drink 8.4 Ounces of Spike Shooter
Caffeine Intake: 3000

Enter your choice: 5
Thank you for using program…
```

5. Class Name: ATMMachine

Create a Java program that contains a main class with three sub-classes that corresponds to the transaction of an ATM machine. Implement the concept of Inheritance, Encapsulation (use private and public modifiers), and Polymorphism (Method overloading and overriding)

Sample Output Dialogue:

```
================================================
    Welcome to this simple ATM machine
================================================

    Please select ATM Transactions
    Press [1] Deposit
    Press [2] Withdraw
    Press [3] Balance Inquiry
    Press [4] Exit

    What would you like to do? 1

    Enter the amount of money to deposit: 20000
    You deposited the amount of 20000.0

    Would you like to try another transaction?

    Press [1] Yes
    Press [2] No
    Enter choice: 1
    Please select ATM Transactions
    Press [1] Deposit
    Press [2] Withdraw
    Press [3] Balance Inquiry
    Press [4] Exit

    What would you like to do? 2

    To withdraw, make sure that you have sufficient balance in your account.
    Enter amount of money to withdraw: 10000

    You withdraw the amount of Php 10000.0

    Would you like to try another transaction?

    Press [1] Yes
    Press [2] No
    Enter choice: 1
    Please select ATM Transactions
    Press [1] Deposit
    Press [2] Withdraw
    Press [3] Balance Inquiry
    Press [4] Exit

    What would you like to do? 3
    Your current balance is 10000.0

    Would you like to try another transaction?

    Press [1] Yes
    Press [2] No
```

```
Enter choice: 1
Please select ATM Transactions
Press [1] Deposit
Press [2] Withdraw
Press [3] Balance Inquiry
Press [4] Exit

What would you like to do? 4

Transaction exited.
Would you like to try another transaction?

Press [1] Yes
Press [2] No
Enter choice: 2

Thank you for using this simple ATM Machine.
```

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