Assignment 1: Complex Number Comparison

Write a program that accepts two complex numbers (real and imaginary parts) and compares them.

- Use `if-else` to determine which complex number has a higher magnitude.
- Print "Equal" if they have the same magnitude.

Assignment 2: Student Grading System

Write a program that accepts a student's marks in 5 subjects.

- Use nested `if-else` to assign grades (`A`, `B`, `C`, `D`, `F`) based on the percentage.
- If the student fails in more than one subject, print "Repeat Year" regardless of percentage.

Assignment 3: Calculator with Conditional Operator

Create a calculator program that takes two operands and an operator (`+`, `-`, `*`, `/`, `%`).

- Use the conditional operator to implement the operations.
- Display an error message if the operator is invalid or if a division by zero is attempted.

Assignment 4: Advanced Leap Year Checker

Write a program that checks if a given year is a leap year.

- Use nested `if-else` for the logic:
  - A year is a leap year if it is divisible by 4 but not by 100, unless divisible by 400.
- Add logic to print the next 5 leap years if the input year is not a leap year.

Assignment 5: Character Classification

Write a program that accepts a single character as input.

- Use a `switch` statement to classify it as a vowel, consonant, digit, or special character.
- Handle uppercase and lowercase vowels separately.

Assignment 6: Quadratic Equation Solver

Write a program to solve a quadratic equation (`ax^2 + bx + c = 0`).

- Use nested `if-else` to classify the roots as real and distinct, real and equal, or imaginary.
- Use conditional operators to check if the coefficients are valid (non-zero `a`).

Assignment 7: Date Validator and Day Counter

Write a program to validate a date entered in `DD-MM-YYYY` format.

- Use `if-else` to check for validity of the day, month, and year, including leap years.
- Add logic to calculate the day of the week for the given date using a switch-case statement.

Assignment 8: Multi-Level Discount System

Develop a program that calculates the total price after applying a discount based on purchase value:

- Purchases below Rs 100: no discount
- Rs100-Rs 500: 10% discount
- Rs 500-Rs 1000: 15% discount
- Above Rs 1000: 20% discount
- Use nested conditional operators for the discount logic.

Assignment 9: Palindrome Number Checker

Write a program to check if a number is a palindrome.

- Use a `while` loop to reverse the digits of the number.
- Extend the program to print all palindrome numbers within a given range.

Assignment 10: Banking System with Menu

Write a program to simulate a simple banking system with the following menu options:

1. Deposit
2. Withdraw
3. Balance Inquiry
4. Exit

- Use a `switch` statement to implement the menu.
- Implement input validation and ensure no withdrawal exceeds the account balance.

Assignment 11: Number Pyramid

Create a program that generates a number pyramid like this:

```
    1
   121
  12321
 1234321
```

- Use nested `for` loops to generate the pattern.
- Allow the user to input the number of rows.

Assignment 12: Sum of Digits

Write a program that computes the sum of the digits of an integer.

- Use a `while` loop to extract and sum the digits.
- Extend it to find the product of digits as well.