

**Problems** involving `if-else`:

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## 1. Tax Calculation Based on Income Slabs

Write a program to calculate the income tax payable based on the following rules:

- Income up to \$50,000: No tax.
  - Income from \$50,001 to \$100,000: 10%.
  - Income from \$100,001 to \$200,000: 20%.
  - Income above \$200,000: 30%. The program should ask for the user's income and display the calculated tax.
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## 2. Nested Discount System

A store provides discounts based on purchase amount and membership status:

- If the customer is a member:
    - Purchases above \$1,000: 20% discount.
    - Purchases between \$500 and \$1,000: 15% discount.
    - Purchases below \$500: 10% discount.
  - If the customer is not a member:
    - Purchases above \$1,000: 10% discount.
    - Purchases below \$1,000: 5% discount.
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## 3. Quadratic Equation Solver

Write a program to solve a quadratic equation of the form  $ax^2 + bx + c = 0$ . Use `if-else` to handle:

- Two distinct real roots.
  - One real root.
  - Complex roots.
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## 4. Password Strength Checker

Create a program that checks the strength of a password based on the following:

- If the password is less than 8 characters: Weak.

- If it contains only letters or only numbers: Medium.
  - If it contains a mix of letters, numbers, and special characters: Strong.
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## 5. Triangle Validity and Type

Write a program to:

1. Check if three sides form a valid triangle.
  2. If valid, determine if it is:
    - Equilateral (all sides equal),
    - Isosceles (two sides equal), or
    - Scalene (no sides equal).
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## 6. Electricity Bill Calculator

Calculate the electricity bill based on the following:

- First 100 units: \$0.50 per unit.
  - Next 100 units: \$0.75 per unit.
  - Next 100 units: \$1.20 per unit.
  - Above 300 units: \$1.50 per unit. Ask the user for the number of units consumed and calculate the total bill.
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## 7. Student Grade Calculator

A student has marks in 5 subjects. Calculate the total marks, percentage, and grade:

- Grade A: Percentage  $\geq 90$ .
  - Grade B: Percentage  $\geq 80$ .
  - Grade C: Percentage  $\geq 70$ .
  - Grade D: Percentage  $\geq 60$ .
  - Fail: Percentage  $< 60$ . Also, check if any subject's marks are below 35, in which case the student fails regardless of the percentage.
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## 8. Banking System

Simulate a simple banking system:

- Ask the user to enter the account balance and the withdrawal amount.
  - Check if the withdrawal amount is a multiple of \$10.
  - Ensure the withdrawal amount doesn't exceed the account balance.
  - Deduct a flat transaction fee of \$5 for every withdrawal.
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## 9. Zodiac Sign Finder

Write a program to determine a person's zodiac sign based on their birth date. Use the following ranges:

- Aries: March 21 - April 19
  - Taurus: April 20 - May 20
  - Gemini: May 21 - June 20
  - (Continue for all zodiac signs...)
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## 10. Parking Fee Calculator

A parking lot charges fees based on hours:

- First 2 hours: Free.
  - Next 3 hours: \$5 per hour.
  - Beyond 5 hours: \$10 per hour. Ask the user for the number of hours their vehicle was parked and calculate the total fee.
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## 11. Advanced Leap Year

Write a program to check if a year is a leap year and also determine the next leap year if the given year is not a leap year.

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## 12. Palindrome Number Checker

Write a program to check if a given number is a palindrome. Use `if-else` to handle invalid inputs (like negative numbers).

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## 13. BMI Calculator

Create a program to calculate the Body Mass Index (BMI) based on user input for height and weight. Categorize the BMI:

- Underweight: BMI < 18.5
  - Normal: BMI 18.5–24.9
  - Overweight: BMI 25–29.9
  - Obesity: BMI  $\geq$  30
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## 14. Number Categorization

Ask the user to input a number and:

- Check if it is positive, negative, or zero.
  - Check if it is even or odd.
  - Check if it is prime.
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## 15. Advanced Login System

Simulate a login system with:

- Three predefined usernames and passwords.
- Allow up to 3 login attempts.
- Display appropriate messages for successful login, incorrect credentials, and lockout after 3 attempts.