***CF Suggestion***

**Algorithm and flow chart practice**

1. A university cafeteria offers discounts to students based on the following rules:

1. If a student is a member of the Cafeteria Club, they get a 20% discount on their total bill.

2. If a student is not a club member but their total bill is more than 500 units (currency), they get a 10% discount.

3. If neither condition is met, no discount is applied.

Write an algorithm to calculate the final amount a student needs to pay based on the total bill and whether they are a club member also draw flowchart

2. A university wants to automate the grading system for a course based on the following rules:

1. If a student's score is 90 or above, they receive a grade of A.

2. If the score is 80 to 89, the grade is B.

3. If the score is 70 to 79, the grade is C.

4. If the score is 60 to 69, the grade is D.

5. If the score is below 60, the grade is F.

Write an algorithm to determine a student’s grade based on their score and also draw the flowchart.

3. An amusement park has specific rules for allowing visitors on a new roller coaster ride. The rules are as follows:

1. A visitor must be at least 12 years old to ride.

2. The visitor's height must be at least 140 cm.

3. If the visitor is under 18 years old, they must have a parent or guardian's permission.

Write an algorithm to determine if a visitor is eligible to ride the roller coaster and also draw the flowchart.

4. A bank wants to automate the process of checking loan eligibility based on the following rules:

1. The applicant must be at least 21 years old.

2. The applicant’s monthly income must be at least 30,000 units (currency).

3. If the applicant’s income is between 30,000 and 50,000, they can only apply for a loan amount of up to 500,000 units.

4. If the income is above 50,000, they can apply for a loan amount of up to 1,000,000 units.

5. Applicants who are under 21 years old or have a monthly income below 30,000 are not eligible for a loan.

Write an algorithm to determine if an applicant is eligible for a loan and the maximum loan amount they can apply for.

5. An online store provides discounts to customers based on the total purchase amount and membership status:

1. If a customer is a Premium Member, they get a 20% discount on any purchase.

2. If a customer is not a member but their total purchase amount exceeds 500 units (currency), they get a 10% discount.

3. If the purchase amount is 1,000 units or more, all customers (both members and non members) get an additional 5% discount on the total after applying the first discount.

4. If neither condition applies, no discount is given.

Write an algorithm to calculate the final amount a customer needs to pay based on their membership status and purchase amount.

6. A company calculates employee bonuses based on the following criteria:

1. If an employee's performance rating is "Excellent", they receive a 20% bonus of their salary.

2. If the performance rating is "Good", they receive a 10% bonus of their salary.

3. If the performance rating is "Average", they receive a 5% bonus of their salary.

4. If the performance rating is "Poor", no bonus is given.

5. In addition, if an employee has worked for 5 or more years, they will receive an extra 5% bonus on top of their performance-based bonus.

Write an algorithm to calculate the bonus an employee should receive based on their performance rating and years of service.

7. A library charges fines for late returns of books based on the following rules:

1. If the book is returned within 5 days after the due date, the fine is 2 units (currency) per day.

2. If the book is returned between 6 to 10 days late, the fine is 5 units per day.

3. If the book is returned more than 10 days late, the fine is 10 units per day.

4. If the book is returned on or before the due date, there is no fine.

5. The maximum fine is capped at 500 units.

Write an algorithm to calculate the fine for a late return based on the number of days late.

8. An electricity provider calculates monthly bills for residential customers based on the following rates:

1. For the first 100 units, the charge is 5 units (currency) per unit.

2. For the next 101 to 300 units, the charge is 7 units per unit.

3. For any usage above 300 units, the charge is 10 units per unit.

4. A fixed service charge of 50 units is added to all bills.

Write an algorithm to calculate the total electricity bill based on the number of units consumed.

9. A movie theater calculates ticket prices based on the customer's age and the show timing:

1. Age-based discounts:

o Children (age 0–12): 50% discount on the standard price.

o Seniors (age 60+): 30% discount on the standard price.

o Regular (age 13–59): No discount on the standard price.

2. Show timing discounts:

o Morning shows (before 12 PM): 20% discount on the ticket price (after applying any age-based discounts).

o Evening shows (after 6 PM): No additional discount.

3. The standard ticket price is 300 units.

Write an algorithm using to calculate the final ticket price for a customer based on their age and the show timing.

10)A local community center organizes a fitness challenge where participants earn points based on the number of workouts completed each week. The scoring system is as follows:

• Each workout completed earns 10 points.

• If a participant completes more than 5 workouts, they receive a bonus of 50 points.

• If the total points (including bonus) exceed 100, the participant is awarded a “Fitness Star” badge. Otherwise, they receive an “Keep Going” message.

Write an algorithm that calculates the total points including any bonus, and displays the participant’s total points and the corresponding message also, draw the flowchart.

11**)**A small café runs a loyalty program where customers earn points based on the total amount they spend in a single visit. The points system is:

• For every 100 Tk spent, the customer earns 10 points.

• If the customer spends more than 1000 Tk, they receive an additional bonus of 100 points.

• If the total points earned (including bonus) are 150 or more, the customer gets a free dessert coupon. Otherwise, they get a thank-you message.

Write an algorithm that calculates the total loyalty points, and show the reward message and also draw the flowchart.

12**)**You are working as a junior developer for a sports equipment company that manufactures customized triangular corner flags for football fields. Each flag is designed based on three given stick lengths that form the triangle’s sides. The production unit needs a program that can quickly determine whether the sticks will form an Equilateral, Isosceles, or Scalene triangle so they can decide the correct stitching pattern.

• Equilateral – all sides equal, best for symmetric flag placement.

• Isosceles – two sides equal, gives a stable but slightly varied shape.

• Scalene – all sides different, gives a unique look for special events.

Now, write an algorithm to determine the triangle category and also draw the flowchart.

13) A year is considered a leap year if it meets one of two conditions. First, if the year is divisible by 400, it is automatically a leap year. Second, even if it is not divisible by 400, it can still be a leap year if it is divisible by 4 but not divisible by 100. In other words, a year qualifies as a leap year if it is divisible by 400, or if it is divisible by 4 and not divisible by 100. If neither of these conditions is met, then the year is not a leap year.

Now, write an algorithm to determine leap year or not and also draw the flowchart.

There are no suggestion for C ):

**Computer networks**

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