Write a C++ program that calculates the cost of a pizza delivery order based on the following criteria:

* Base pizza cost $10.
* There's a $2 delivery charge.
* If the order is for a large pizza (indicated by 'L' or 'l'), add $5 to the base cost.
* If the order is for extra cheese (indicated by 'E' or 'e'), add $2 to the cost.
* If the order is for both a large pizza and extra cheese, add $7 to the cost.
* Prompt the user for their order details and calculate the total cost.

Create a C++ program that calculates the cost of a train ticket based on the following criteria:

* The base ticket price is $50.
* If the passenger is a child (age under 12), there's a 50% discount.
* If the passenger is a senior citizen (age 65 or older), there's a 30% discount.
* If the passenger is a student (age 12 to 18), there's a 10% discount.
* If none of the above conditions apply, there's no discount.
* Write a program that prompts the user for their age and calculates the final ticket price.

Student Enrollment System

You are tasked with creating a simple student enrollment system in C++. The system should prompt the user for the student's name, age, and the course they want to enroll in (e.g., Math, English, Science). Depending on the course, apply a discount as follows: 10% for Math, 5% for English, and no discount for Science. Calculate and display the total cost of enrollment. Additionally, if the student is below 18 years old, apply a 15% discount on the total cost. Design the program with appropriate conditional statements.

Online Shopping Cart

Design a C++ program for an online shopping cart. The program should ask the user to enter the price and quantity of items they want to purchase. Calculate the subtotal for each item and then calculate the total cost of all items. If the total cost is greater than $100, apply a 10% discount. If the total cost is greater than $200, apply a 15% discount. Display the itemized list of purchases, the subtotal, discounts applied, and the final total.

Movie Ticket Booking System

Create a C++ program for a movie ticket booking system. The program should allow the user to select a movie from a list, specify the number of tickets they want to purchase, and enter their age. Based on the movie, the program should apply different pricing rules:

- For regular movies, the ticket price is $12 for adults (age 18-64) and $8 for children (age 0-17) and seniors (age 65+).

- For 3D movies, there is an additional $3 surcharge per ticket.

- For IMAX movies, there is an additional $5 surcharge per ticket.

Calculate and display the total cost for the tickets, considering the user's choices.

Hotel Reservation System

Design a C++ program for a hotel reservation system. The program should prompt the user to select a room type (e.g., Standard, Deluxe, Suite), specify the number of nights they want to stay, and inquire if they want additional services (e.g., breakfast, WiFi). Calculate and display the total cost based on the room type and services selected. Apply a 10% discount for stays longer than 7 nights.

Theater Seating Reservation System

Design a C++ program for a theater seating reservation system. The program should allow users to select seats for a movie show. Implement rules such as:

- The theater has a fixed layout with a certain number of rows and columns.

- Different seats may have different prices.

- Implement a reservation system that ensures a seat can only be reserved once.

- Display the total cost of the selected seats and reservation details.

Online Food Ordering System

Create a C++ program for an online food ordering system. The program should allow users to select items from a menu, specify quantities, and customize their order (e.g., toppings on a pizza). Implement rules such as:

- Each menu item has a different price.

- Apply discounts based on promotions or coupon codes.

- Calculate the total cost of the order, including taxes and delivery charges.

- Display the final cost and order details.

Hotel Room Booking System

Design a C++ program for a hotel room booking system. The program should allow users to select a room type (e.g., Standard, Deluxe, Suite) and specify the number of nights they want to stay. Implement rules such as:

- Different room types have different nightly rates.

- Apply discounts for longer stays (e.g., 10% for stays longer than 5 nights).

- Calculate the total cost of the stay and display booking details.

Car Rental Reservation System

Develop a C++ program for a car rental reservation system. The program should allow users to select a car model, specify rental duration, and choose optional features (e.g., GPS, insurance). Implement rules such as:

- Each car model has a different daily rental rate.

- Additional features may have extra costs.

- Apply discounts for longer rental durations.

- Calculate the total cost of the rental and display reservation details.

Certainly, here are detailed and extensive case study-style questions that can be solved using conditional statements (if, if-else, else-if, switch statement, and the ternary operator) without the use of functions, arrays, or loops:

Online Course Registration System

Imagine designing a C++ program for an online course registration system. The system should allow students to choose courses and calculate their tuition fees. Consider the following details:

- Each course has a unique course code, title, credit hours, and cost per credit hour.

- Students can enroll in multiple courses.

- Students are eligible for discounts based on the total number of credit hours they enroll in:

- 12 or more credit hours: 10% discount

- 9-11 credit hours: 5% discount

- Fewer than 9 credit hours: no discount

- Students can apply for financial aid, which can reduce the tuition cost by a certain percentage.

- Display the course details, calculate the total tuition cost, apply discounts and financial aid, and display the final cost for the student.

Mobile Phone Plan Selection

Create a C++ program that helps customers choose a mobile phone plan based on their usage. Consider the following aspects:

- Different mobile plans offer varying numbers of talk minutes, text messages, and data allowances.

- Plans have different monthly fees and overage charges.

- Allow customers to input their estimated monthly usage (minutes, texts, data).

- Determine the best plan for the customer based on their usage, taking into account overage charges.

- Display the recommended plan, monthly cost, and estimated annual cost.

Vacation Package Booking

Design a C++ program for a vacation package booking system. Consider the following details:

- Vacation packages include flights, accommodations, and optional activities.

- Each vacation package has a base cost, which varies by destination.

- Optional activities have individual prices.

- Allow customers to select a destination and choose optional activities.

- Calculate the total cost of the vacation package based on their choices.

- Offer discounts for early bookings or promotions.

- Display the final cost and booking details.

Menu Recommendation System

Develop a C++ program that helps users choose a restaurant menu item based on their dietary preferences and restrictions. Consider the following aspects:

- Each menu item has a name, description, ingredients, and price.

- Users can specify dietary preferences (e.g., vegetarian, gluten-free).

- Filter menu items based on dietary preferences.

- Recommend menu items that match the user's preferences.

- Display recommended items, their descriptions, and prices.

Car Configuration Tool

Imagine designing a C++ program for a car configuration tool. Users can customize their ideal car by choosing various options, including car model, color, interior, and additional features. Consider the following details:

- Offer multiple car models with different base prices.

- Charge extra for premium colors and interior options.

- Provide a list of additional features (e.g., sunroof, navigation, leather seats) with associated costs.

- Calculate the total cost of the configured car based on the user's choices.

- Display the final configuration and cost for the user.

Health Insurance Plan Selection

Create a C++ program that helps individuals select a health insurance plan based on their needs and budget. Consider the following aspects:

- Health insurance plans have different levels of coverage and premiums.

- Allow users to specify their expected medical expenses for the year.

- Recommend a suitable insurance plan based on their expected expenses.

- Display the recommended plan, monthly premium, and estimated annual expenses.

Personal Budgeting Assistant

Design a C++ program that assists individuals in managing their personal budgets. Users can input their income and expenses, categorize expenses, and set budget limits for categories. Consider the following details:

- Allow users to input their monthly income and various monthly expenses.

- Categorize expenses into groups (e.g., housing, transportation, groceries).

- Calculate the total income, total expenses, and the difference (savings or deficit).

- Display the budget summary and indicate whether the user is within their budget.

Hotel Reservation System with Rewards

Develop a C++ program for a hotel reservation system that incorporates a rewards program. Consider the following aspects:

- Hotels offer different room types with varying nightly rates.

- Customers can join a rewards program that provides discounts based on membership level (e.g., Silver, Gold, Platinum).

- Calculate the total cost of the hotel stay and apply rewards discounts.

- Display the final cost, rewards points earned, and membership level benefits.

Certainly, here are more complex case study-style questions that can be solved using conditional statements (if, if-else, else-if, switch statement, and the ternary operator) without the use of functions, arrays, or loops:

Investment Portfolio Analysis

Design a C++ program for analyzing an investment portfolio. Consider the following details:

- Users can input their investments (e.g., stocks, bonds) with purchase prices and current values.

- Calculate the total portfolio value and the percentage return on investment for each asset.

- Implement a risk assessment algorithm based on investment types (e.g., conservative, moderate, aggressive).

- Display the portfolio summary, risk level, and recommendations for adjustments.

Smart Home Control System

Create a C++ program for a smart home control system. Consider the following aspects:

- Users can control various smart home devices (e.g., lights, thermostat, security system).

- Implement user-defined automation rules (e.g., turn off lights at 10 PM).

- Users can set energy-saving preferences and receive recommendations.

- Calculate energy consumption and savings based on user settings.

- Display control options, energy usage, and cost estimates.

Video Game Character Customization

Imagine designing a C++ program for customizing video game characters. Consider the following details:

- Offer various character classes (e.g., warrior, mage, archer) with different attributes.

- Allow users to customize appearance, abilities, and equipment.

- Calculate character statistics (e.g., health, damage) based on user choices.

- Implement a leveling system with experience points and character progression.

- Display character details, attributes, and abilities.

Airline Reservation System with Pricing

Design a C++ program for an airline reservation system that includes complex pricing rules. Consider the following aspects:

- Flights have different classes (economy, business, first class) with varying prices.

- Offer discounts for round-trip bookings and multi-city itineraries.

- Implement dynamic pricing based on seat availability.

- Allow users to add optional services (e.g., baggage, in-flight meals) with associated costs.

- Calculate the total cost of the flight, including all selections and discounts.

Autonomous Vehicle Navigation

Imagine designing a C++ program for an autonomous vehicle navigation system. Consider the following details:

- The vehicle can operate in different modes, such as regular, eco, and sport.

- The navigation system should consider traffic conditions, speed limits, and route preferences.

- Implement decision-making algorithms for lane changes, merging, and overtaking other vehicles.

- Provide real-time feedback on energy consumption, time estimates, and safety recommendations.

Stock Trading Algorithm

Create a C++ program that simulates a complex stock trading algorithm. Consider the following aspects:

- The algorithm should analyze historical stock data, market trends, and news sentiment.

- Implement various trading strategies (e.g., day trading, swing trading).

- Use technical indicators (e.g., moving averages, RSI) to make buy and sell decisions.

- Calculate and display the algorithm's performance, including profits and losses.

Hospital Patient Triage System

Design a C++ program for a hospital's patient triage system. Consider the following details:

- Patients arrive with different medical conditions, urgency levels, and symptoms.

- Implement a prioritization algorithm based on severity and available resources.

- Allocate patients to appropriate treatment areas (e.g., emergency room, urgent care).

- Display the triage results, estimated wait times, and recommended actions.

Space Exploration Mission Planner

Imagine developing a C++ program for planning space exploration missions. Consider the following aspects:

- The program should handle mission parameters, spacecraft design, and trajectory planning.

- Implement decision-making logic for route selection, gravity assists, and fuel optimization.

- Account for unforeseen events and provide contingency plans.

- Display mission profiles, launch windows, and scientific objectives.

Urban Traffic Management System

Design a C++ program for a sophisticated urban traffic management system. Consider the following aspects:

- The system should control traffic signals at multiple intersections in real-time.

- Implement advanced traffic optimization algorithms to minimize congestion and wait times.

- Consider input data such as traffic flow, vehicle counts, and pedestrian crossings.

- Integrate traffic cameras and sensors to make dynamic decisions.

- Display real-time traffic conditions, congestion predictions, and optimized signal timings.

Financial Portfolio Management

Imagine creating a C++ program for managing an extensive financial portfolio. Consider the following details:

- The portfolio includes various asset classes (e.g., stocks, bonds, real estate).

- Implement advanced financial models and risk analysis algorithms.

- Allow users to create custom investment strategies and portfolios.

- Perform extensive historical data analysis for asset selection.

- Provide detailed financial projections, risk assessments, and portfolio performance analytics.

Advanced Flight Booking System

Create a C++ program for an advanced flight booking system that caters to complex travel needs. Consider the following aspects:

- Integrate with multiple airlines, routes, and travel classes.

- Implement dynamic pricing strategies based on demand and availability.

- Allow users to plan multi-leg, multi-destination itineraries.

- Consider layover durations, preferred airlines, and flight schedules.

- Display detailed flight options, seat availability, and cost breakdowns.

Autonomous Robot Navigation in a Smart Warehouse

Design a C++ program for controlling autonomous robots in a smart warehouse environment. Consider the following details:

- The robots need to efficiently navigate the warehouse to pick and transport items.

- Implement advanced pathfinding algorithms considering obstacles, traffic, and picking orders.

- Robots should make real-time decisions on task prioritization and route optimization.

- Integrate with inventory systems for accurate item tracking and order fulfillment.

- Display live status updates, task allocations, and warehouse efficiency metrics.