Methods in C# - Practical 2

Basic Methods with Parameters and Without Parameters

1. **Method Without Parameters**

   - Write a method **`PrintHello`** that prints "Hello, World!" to the console. Call this method from the `Main` method.

2. **Method With Parameters**

   - Write a method **`GreetUser`** that takes a string parameter `name` and prints "Hello, [name]!" to the console. Call this method with different names from the `Main` method.

3. **Method with Multiple Parameters**

   - Write a method **`CalculateSum`** that takes two integers as parameters and returns their sum. Call this method from the `Main` method and print the result.

Default Parameters

4. **Method with Default Parameters**

   - Write a method **`PrintMessage`** that takes a string parameter `message` with a default value of "Hello, World!". The method should print the message to the console. Call this method with and without providing the parameter value.

5. **Method with Multiple Default Parameters**

   - Write a method **`DisplayInfo`** that takes two parameters: `name` (string) and `age` (int, default value 25). The method should print "Name: [name], Age: [age]". Call this method with different combinations of arguments.

Named Arguments

6. **Using Named Arguments**

   - Write a method **`OrderCoffee`** that takes three parameters: `size` (string), `sugar` (int), and `milk` (bool). The method should print the order details. Call this method using named arguments.

7. **Mixed Positional and Named Arguments**

    - Write a method **`BookFlight`** that takes three parameters: `destination` (string), `date` (string), and `classType` (string). Call this method using a mix of positional and named arguments.

Method Overloading

8. **Simple Method Overloading**

    - Write overloaded methods **`Multiply`** that can multiply two integers, two doubles, and three integers. Call these methods from the `Main` method. (need to create 3 sperate method with same name)

9. **Overloading with Different Parameter Types**

    - Write overloaded methods **`Display`** that can display a string, an integer, and a double. Call these methods from the `Main` method. (three sperate method that take different type parameters)

10. **Overloading with Different Parameter Counts**

    - Write overloaded methods **`CalculateArea`** that can calculate the area of a square (one parameter) and a rectangle (two parameters). Call these methods from the `Main` method.

Real-Time Problems

11. **Temperature Conversion**

    - Write a method **`ConvertTemperature`** that takes a temperature in Celsius and returns it in Fahrenheit. Overload this method to also take a temperature in Fahrenheit and return it in Celsius.

12. **Shopping Cart**

    - Write a method **`AddToCart`** that takes a product name and a quantity, and prints the added items. Overload this method to also take a price and calculate the total cost.

13. **Bank Transactions**

    - Write a method **`Transfer`** that takes an account number and an amount, and prints the transfer details. Overload this method to also take a description of the transaction.

14. **Distance Calculation**

- Write a method **`CalculateDistance`** that takes two points (x1, y1, x2, y2) and returns the distance between them. Overload this method to also calculate the distance in 3D space (x1, y1, z1, x2, y2, z2).

15. **Date Formatting**

- Write a method **`FormatDate`** that takes a DateTime object and returns a string in "MM/dd/yyyy" format. Overload this method to also accept a different format string.

16. **User Authentication**

- Write a method **`AuthenticateUser`** that takes a username and password and returns a boolean indicating whether the authentication was successful. Overload this method to also accept a security question answer for additional authentication.

17. **Email Sending**

- Write a method **`SendEmail`** that takes a recipient email address and a message. Overload this method to also accept a subject line and a list of CC recipients.

18. **Calculate Discounts**

- Write a method **`CalculateDiscount`** that takes an original price and a discount percentage and returns the discounted price. Overload this method to also accept a boolean indicating if the discount is a flat amount instead of a percentage.

19. **File Upload**

- Write a method **`UploadFile`** that takes a file path and uploads the file. Overload this method to also accept a file description and an upload timestamp.

20. **Payment Processing**

- Write a method **`ProcessPayment`** that takes a payment amount and a payment method (e.g., credit card, PayPal). Overload this method to also accept payment details such as card number or PayPal ID.

21. **User Registration**

- Write a method **`RegisterUser`** that takes a username and password and returns a boolean indicating if the registration was successful. Overload this method to also accept an email and a phone number.

22. **Book Reservation**

- Write a method **`ReserveBook`** that takes a book ID and a user ID and returns a boolean indicating if the reservation was successful. Overload this method to also accept a reservation date.

23. **Generate Reports**

- Write a method **`GenerateReport`** that takes a report type (e.g., sales, inventory) and returns a string with the report details. Overload this method to also accept a date range for the report.

24. **Product Search**

- Write a method **`SearchProduct`** that takes a product name and returns a list of matching products. Overload this method to also accept a category and a price range.

25. **Weather Forecast**

- Write a method **`GetWeatherForecast`** that takes a city name and returns the weather forecast for today. Overload this method to also accept a number of days for an extended forecast.

26. **Calculate Tax**

- Write a method **`CalculateTax`** that takes an income amount and returns the tax amount. Overload this method to also accept a tax rate. (default tax rate = 10.0)

27. **Movie Ticket Booking**

- Write a method **`BookTicket`** that takes a movie name and a number of tickets and prints the booking details. Overload this method to also accept a show time.

28. **Food Order**

- Write a method **`OrderFood`** that takes a food item and a quantity and prints the order details. Overload this method to also accept a special request (e.g., no onions).

29. **Travel Booking**

- Write a method **`BookTravel`** that takes a destination and a travel date and prints the booking details. Overload this method to also accept a number of travelers and travel class (e.g., economy).

30. **Schedule Meeting**

- Write a method **`ScheduleMeeting`** that takes a meeting title and a time and prints the meeting details. Overload this method to also accept a list of participants.