USED CAR LOT

Objectives: Collections, Objects, Inheritance

Task: Hold information about Car inventory using a collection of Car objects, including a UsedCar subclass.

What will the application do?

- Display a set of at least 6 cars (at least 3 new and 3 used) along with Add and Quit options
- Let the user select one of the cars.
- Ask if they want to buy the car. If they enter yes, remove it from the list.
- If they want to add another car to the list, get the details, instantiate a new car of the appropriate class (Car class for new cars, or UsedCar), and add it to your data collection.
- Keep looping until they choose to quit.

Build Specifications

- If your instructors tells you to work in pairs, stay with your assigned pair for this lab.
- Create a class named Car (5 points) to store the data about a car. This class should contain:
    - Data members for car details
        - A string for the make
        - A string for the model
        - An int for the year
        - A decimal for the price
    - A no-arguments constructor that sets data members to default values (blanks or your choice)
    - A constructor with four arguments matching the order above
    - Properties for all data members
    - An override to the ToString() method returning a formatted string with the car details.
- Create a subclass of Car named UsedCar (3 points). UsedCar has additional members:
    - Data member: A double for mileage.
    - Constructor: Takes five arguments (same order as constructor from last lab with the mileage last).
    - ToString: overrides Car's ToString() to include (Used) and the mileage.
- Discuss with your partner how a CarLot class (5 points) could contain a member that stores the information. In what cases would each of these make more sense?
    - A member that's a two-dimensional array of cars
    - A member that's a List<Car>
    - A Dictionary <?, Car>
    - Any other option?

    - However you store information inside the class, this class should include methods to
        - Add a car
        - List all cars to the console
        - Remove a car

Hints:

- Use the right access modifiers (public/private/protected)!
- Make sure to match the signature of ToString() from Object.
- You can just use \t tab escape characters to line things up, or if you want to get fancier, look up text formatters.
- Let polymorphism work for you.
- Remember casting.

Extra Challenges:

- Write a CarLotApp class which instantiates and puts cars in your CarLot class. It should invoke CarLot methods to let a user:
    - List all cars.
    - Buy a car, which removes it from the inventory.
    - Add a car.

  The main method would then create an instance of CarLotApp and call its methods as needed.
- Think about other methods which might be useful for your CarLot. Implement them and modify your app to take advantage of them.
- Modify or create a class named Validator with static methods to validate the data in this application.
- Create an Admin mode which lets the user edit, delete, or replace cars. Move the Add a car feature here.
- Provide search features:
    - View all cars of an entered make.
    - View all cars of an entered year.
    - View all cars of an entered price or less.
    - View only used cars or view only new cars.

See next page for Console Preview.

Console Preview
Your output will vary based on decisions you make with your partner.

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Welcome to Grant Chirpus' Used Car Emporium!

1. Nikolai Model S    2017       $54,999.90
2. Fourd   Escapade   2017       $31,999.90
3. Chewie  Vette      2017       $44,989.95
4. Hyonda  Prior      2015       $14,795.50 (Used) 35,987.6 miles
5. GC      Chirpus    2013       $8,500.00 (Used) 12,345.0 miles
6. GC      Witherell  2016       $14,450.00 (Used) 3,500.3 miles
7. Add a car
8. Quit

Which car would you like?  {6}
GC         Witherell  2016       $14,450.00 (Used) 3,500.3 miles
Would you like to buy this car? {y}
Excellent!  Our finance department will be in touch shortly.

1. Nikolai Model S    2017       $54,999.90
2. Fourd   Escapade   2017       $31,999.90
3. Chewie  Vette      2017       $44,989.95
4. Hyonda  Prior      2015       $14,795.50 (Used) 35,987.6 miles
5. GC      Chirpus    2013       $8,500.00 (Used) 12,345.0 miles
6. Add a car
7. Quit

Which car would you like?  {6}
Have a great day!
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