

Exercise 1: The Basic Auto-Property

Goal: Create a simple data container.

- Create a class called Book.
- Add two auto-implemented properties: Title (string) and Author (string).
- In your Main method, instantiate a book and use **Object Initializer** syntax to set the values.
- Print the book's details to the console.

Exercise 2: The Calculated Property

Goal: Practice using "Expression-Bodied" properties (\Rightarrow).

- Create a class called Rectangle.
- Add two properties: Width (double) and Height (double).
- Add a read-only property called Perimeter that calculates the perimeter ($2 \times (\text{Width} + \text{Height})$) using the \Rightarrow syntax.
- Test it by changing the Width and checking if the Perimeter updates automatically.

Exercise 3: Validation (The Guard Dog)

Goal: Use a "Full Property" with a backing field to protect data.

- Create a class called BankAccount.
- Create a private field `_balance`.
- Create a public property `Balance`.
 - The get should return the balance.
 - The set should **only** update the balance if the value is greater than or equal to 0. If someone tries to set a negative balance, print "Error: Negative balance not allowed."
- Try setting the balance to -50 in your Main method to test the logic.

Exercise 4: The Immutable ID (init)

Goal: Use the init keyword to lock data.

- Create a class called Employee.
- Add a property EmployeeID (int) that uses init instead of set.
- Add a property Name (string) that uses a normal set.
- In Main, create an employee. Try to change the EmployeeID on the next line and observe the compiler error.

Exercise 5: Secure Access (private set)

Goal: Control who can modify data.

- Create a class called SmartLight.
- Add a property Brightness (int). It should have a public get but a private set.
- Add a method called AdjustBrightness(int level). Inside this method, ensure the level is between 0 and 100 before setting the property.
- Verify that you can read the brightness from Main, but you can only change it by calling the AdjustBrightness method.