Object Attack

Outstanding Objects
Dot is so excited to see you back at Decomposphere! Today, you’ll learn more about objects and how they can keep their properties out of sight. Let’s jump right in!

Who let the dogs out?
In object-oriented programming, we can choose to keep the variables and functions of an object private. When these features are private, other objects cannot directly control them. Each object can have a combination of both private and public features.

What’s the difference between private and public?
While private properties (variables and functions) cannot be directly controlled by other objects, public properties can. Let’s take a look at an example with Dot’s pet dog, Rocky!

Rocky the Labrador

<table>
<thead>
<tr>
<th>Variables</th>
<th>Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Who Rocky is)</td>
<td>(What Rocky does)</td>
</tr>
<tr>
<td><strong>private breed</strong></td>
<td><strong>private bark</strong> Dot can’t control when Rocky barks or sleeps</td>
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<tr>
<td><strong>private age</strong></td>
<td><strong>private sleep</strong></td>
</tr>
<tr>
<td><strong>public owner</strong></td>
<td><strong>public feed</strong> Rocky’s owner, Dot, can control who owns Rocky</td>
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<tr>
<td></td>
<td><strong>public play</strong> Rocky’s owner, Dot, can control who owns Rocky</td>
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Why private?
Dot can’t control Rocky’s breed and age.

Why public?
Rocky’s owner, Dot, can control who owns Rocky

Why private?
Dot can’t naturally control when Rocky barks or sleeps

Why public?
Dot can control when to feed or play with Rocky
Why do we use private properties?
In computer science, we use private properties to protect features like breed, mood, and hunger from being directly controlled by other objects.

How can we change private variables?
Private variables can only be changed through public functions. For example, let’s take a look at our public function, public feed:

Since our feed function is public (Dot can decide when to feed Rocky), Dot can indirectly control Rocky’s private hunger and mood variables.

However, some private variables can never be changed. For example, we cannot change Rocky’s breed as a Labrador.
Grid Attack!
In this action-packed game, you will be creating your own player object with its private/public variables and functions to attack an opponent!

Materials
- 2 tokens for you and your friend (This will represent where you are on the board!)
- 1 die 🎲

How to Play
- Define your player object’s variables by creating a name, age, and health value. Each player starts the game with a health level of 5 (out of 5). Next to each variable and function, circle whether it is private or public! (Think: Can these properties be directly changed or used by other objects?)
- Take turns rolling the die with your friend. Use the walk function to move your token the number of steps you rolled in any direction (up, down, left, right). Keep track of your activity in your activity list.
  (Ex. If you rolled a 6, you can choose to walk 3 steps left and 3 steps up).

If you are on 🍟, use the eat function to add 1 point to your health.

If you are at the same location as your opponent, use the attack function to subtract 2 points from your opponent’s health.

• Winning the game: You win the game when your opponent’s health status reaches 0.
### My Player Object

#### Variables
- **Private/Public Name**
  - (circle one)
- **Private/Public Age**
  - (circle one)
- **Private/Public Health**
  - (circle one)
  - 5

#### Functions
- **Private/Public Walk**
  - (circle one)
  - Move the number of steps rolled
- **-2**
  - (circle one)
  - Subtract 2 points from opponent’s health
- **Private/Public Eat**
  - (circle one)
  - Add 1 point to your own health

### My Activity List

<table>
<thead>
<tr>
<th>Function</th>
<th>Health</th>
<th>Function</th>
<th>Health</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ex. Walk left 3 steps</td>
<td>5</td>
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Decomposphere
Mission 3
START
CS Hands-On
Object Attack