Learning Objective

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We will learn about OOPS Fundamentals:

- Inheritance
- Encapsulation
- Polymorphism

What is Encapsulation?

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Hiding internal state of an object is known as ***data encapsulation*** *(aka **Data hiding**).*

Example :

In a retail application the product availability (quantity) in stock is hidden from customers. The quantity will be deduced when customers buy products.

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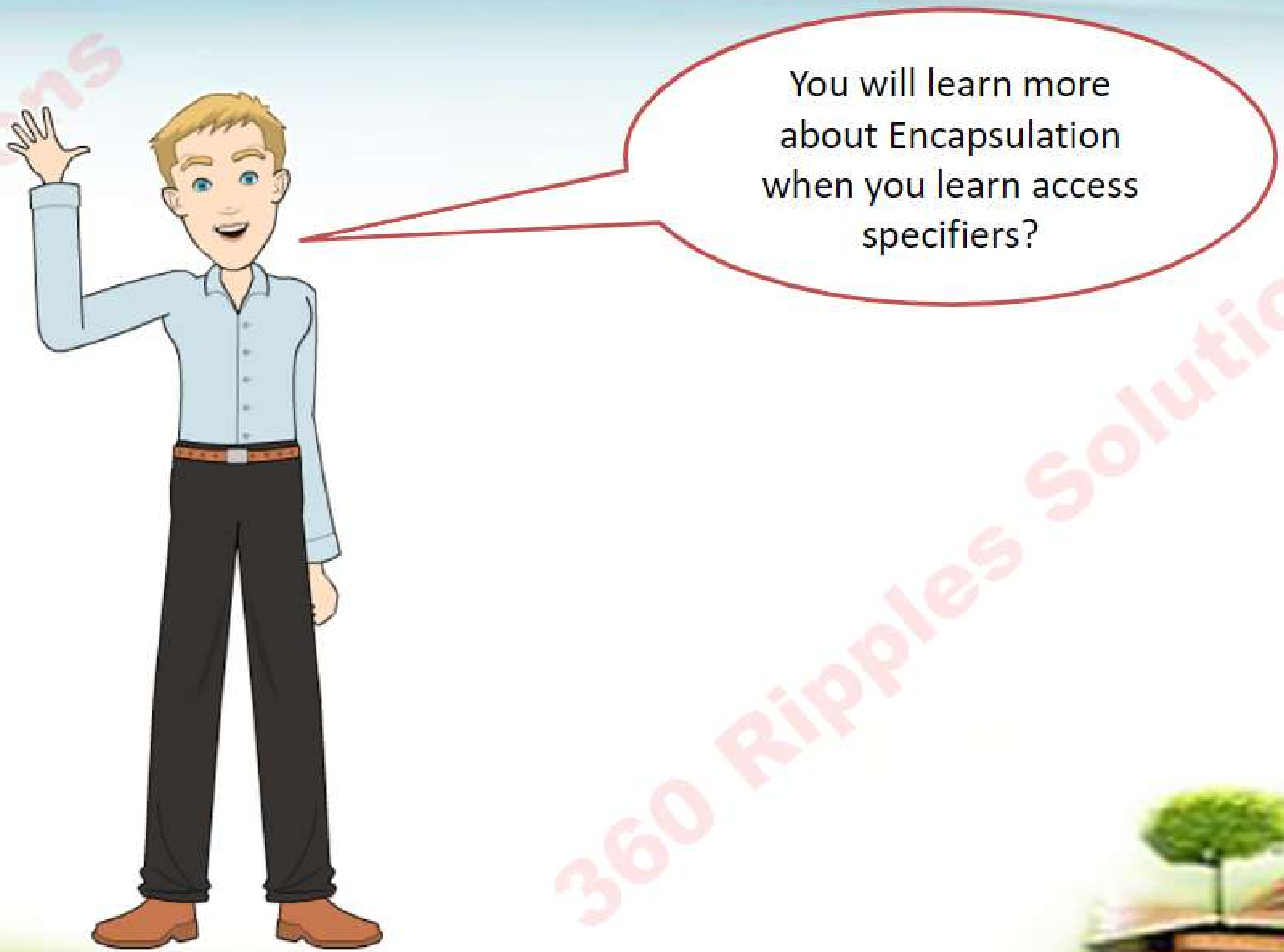
You will learn more about Encapsulation when you learn access specifiers?

What is Inheritance?

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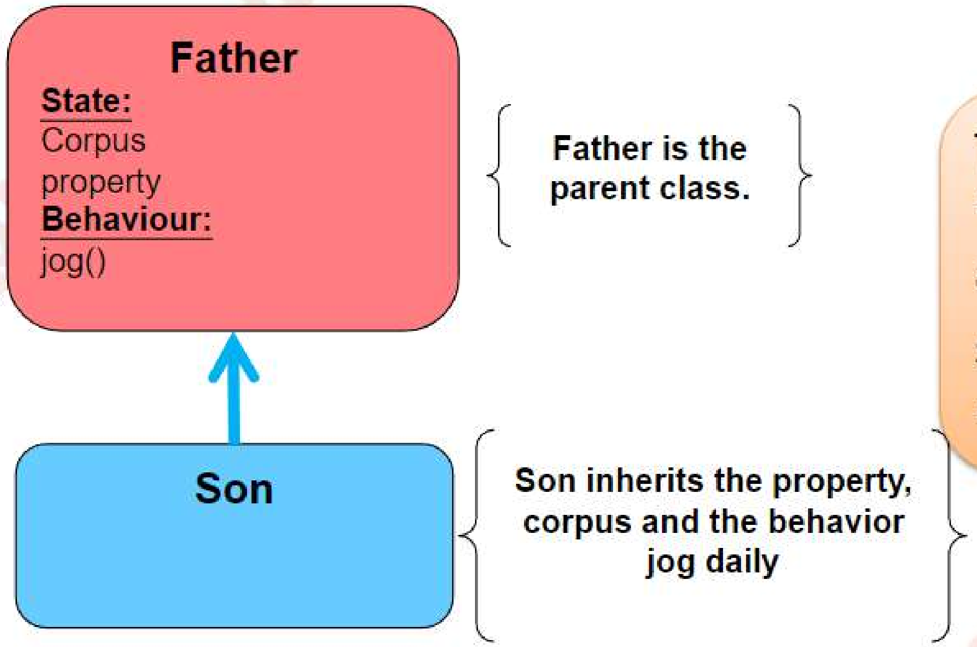
Object-oriented programming allows classes to *inherit* the state and behavior from other classes.



Father
State:
Corpus
property
Behaviour:
jog()
Son
Father is the parent class.
Son inherits the property, corpus and the behavior jog daily

The father is called the "*Super*" (or) "*base*"class and the

son is called the

"*Sub*"*class.*

Deep Dive into Inheritance

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- Child class inherits all the behavior and states of the parent class.
- All the common methods which needs to be reused across many classes are placed in the parent class
- The sub class can also override the definition of existing methods by providing its own implementation.

You will learn about overriding soon.

What is Polymorphism?

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Polymorphism per dictionary refers to a principle in biology in which an organism or species can have many different forms or stages.

OOPS Polymorphism:

Subclasses of a class can define their own unique behaviors and yet share some of the same functionality of the parent class.

Ways of achieving Polymorphism

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- **Method Overloading –** Two different implementations of the same method available in the same class.
- **Method overriding** – Methods of a subclass override the methods of a super class.
- **Dynamic Method Binding –** At run time the interpreter will find out which objects method needs to be executed.

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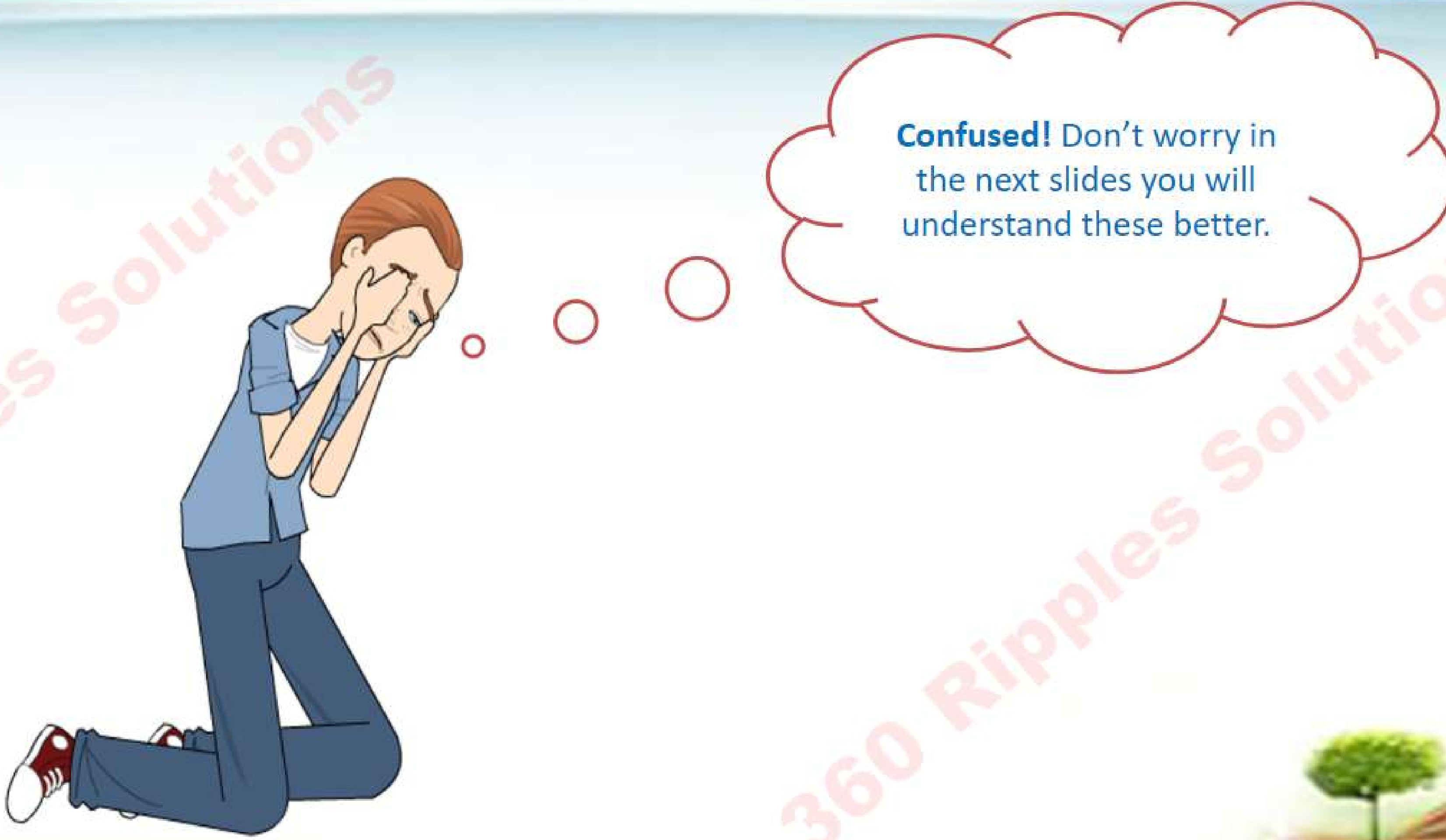
Confused! Don't worry in the next slides you will understand these better.

Method Overloading

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Method Overloading – Two different implementation of the same method available in the same class.

- Changing the input parameter data type.
- Changing the number of input parameters.

Lets assume there is a object “Boy” who can “run” (behavior). Now the boy runs casually during playing but in a race he will run fast. So he has two implementations of running.

Implementation 1:
```
run()
{
        Run casually
}
```

Implementation 2:
```
run(race)  // Added  input parameter, to
overload  method.
{
        Run fast.
}
```

Method Overriding

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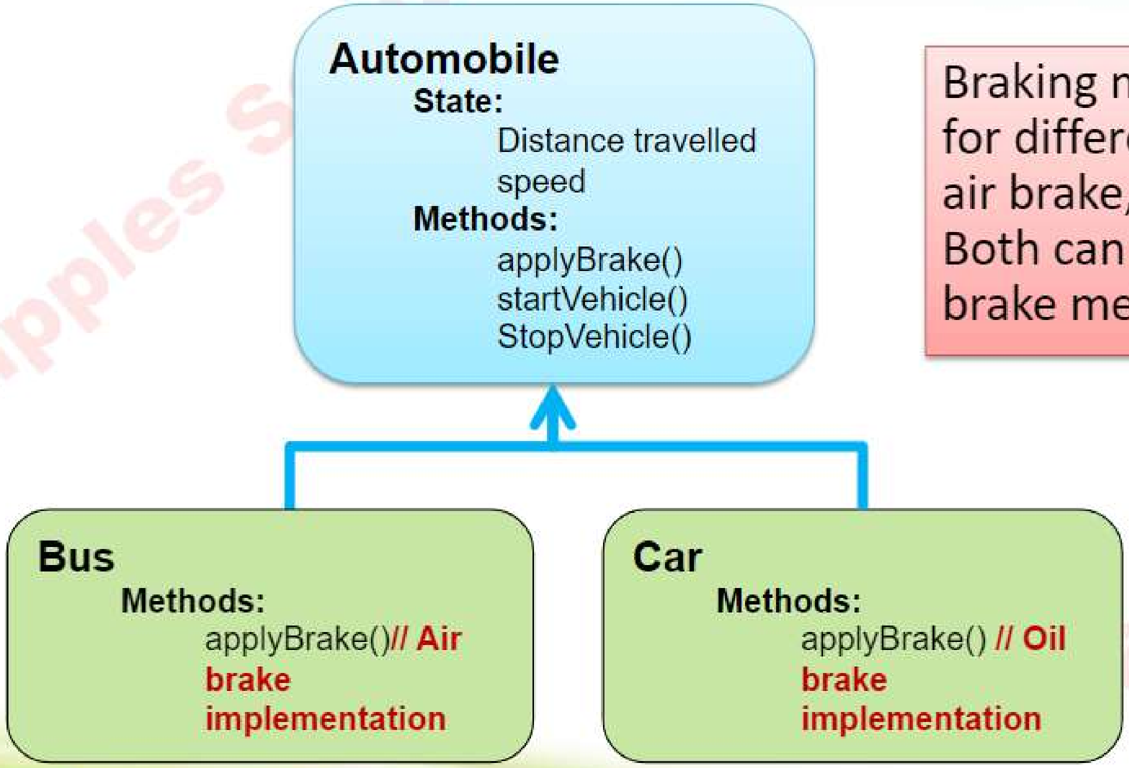
Method overriding – Methods of a base class override the methods of a super class.



Braking methods are different for different vehicle. Bus uses air brake, car uses oil brake. Both can override the apply brake method accordingly.