

# Class Concepts

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# Class Concepts

- Abstraction
  - A generalized model or interface to something
    - Automobile – external operation is independent of powertrain
      - Gas
      - Diesel
      - Hybrid
      - Electric
    - Laptop – external operation is independent of processor
      - Core i3 processor
      - Core i7 processor
      - AMD processor
      - ARM processor

# Class Concepts

- Abstract Data Type
  - Data whose values and operations are defined but whose implementation is hidden from the user
- Typically created by the programmer
  - Values and operations are “visible”
  - Implementation is “hidden”
    - The programmer knows the implementation but the user does not
    - Allows the implementation to be changed without impacting the user
- The programmer defines the data, operations and implementation for the data type

# Class Concepts

- Abstract Data Type
  - In Object Oriented programming languages – Abstract Data Types are implemented as Classes
- Class
  - Defined Type
  - Similar to a structure
    - Contains variables that are of various types
  - Includes functions in its definition (operations)
  - Combining data and operations into a single type is called encapsulation
- Object
  - Instance of type “class”

# Class Concepts

- Circle Class
  - Data
    - radius
  - Operations
    - Set radius
    - Get radius
    - Calculate area
    - Calculate circumference
- Objects
  - Circle1
  - Tabletop
  - Tire\_Profile

Circle
Member Variables radius
Member Functions setRadius() getRadius() calcArea() calcCirc()

# Class Concepts

- Creating a Class

```
class ClassName{  
    declarations of member variable  
    and member functions  
};
```

Notes:

Class names typically use CamelCase  
note the semicolon at the end

# Class Concepts

- Terminology

Data  $\leftrightarrow$  Member Variables  $\leftrightarrow$  Attributes

Operation  $\leftrightarrow$  Member Function  $\leftrightarrow$  Method  $\leftrightarrow$  Procedures