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

<table>
<thead>
<tr>
<th>Circle</th>
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</thead>
<tbody>
<tr>
<td>Member Variables</td>
</tr>
<tr>
<td>radius</td>
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<td></td>
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<tr>
<td>Member Functions</td>
</tr>
<tr>
<td>setRadius()</td>
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<tr>
<td>getRadius()</td>
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<tr>
<td>calcArea()</td>
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<tr>
<td>calcCirc()</td>
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</tbody>
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Class Concepts

• Creating a Class

```cpp
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 <-> Member Variables <-> Attributes

Operation <-> Member Function <-> Method <-> Procedures