Class Design

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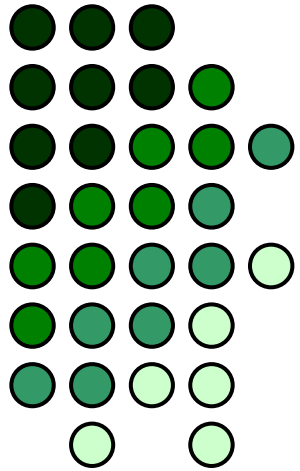
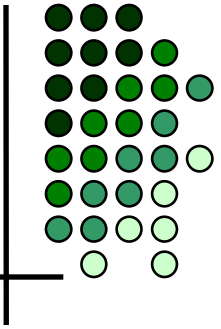
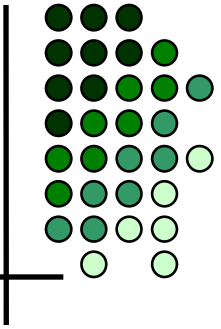


Class Design



- Unified Modeling Language (UML)
  - Standardized graphical notation used to create an abstract model of a system
- UML Diagrams
  - ***Class Diagram***
  - ***Collaboration Diagram***
  - Object Diagram
  - Use Case Diagram
  - Sequence Diagram
  - Statechart Diagram
  - Activity Diagram
  - Component Diagram
  - Deployment Diagram

Class Design



Class Diagram

- Shows the behavioral and data management responsibilities of each class
- Does not show the functional requirements of a system from the viewpoint of the end user
- Used to document the class that constitute a system

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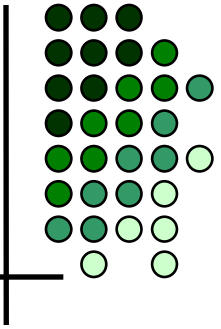
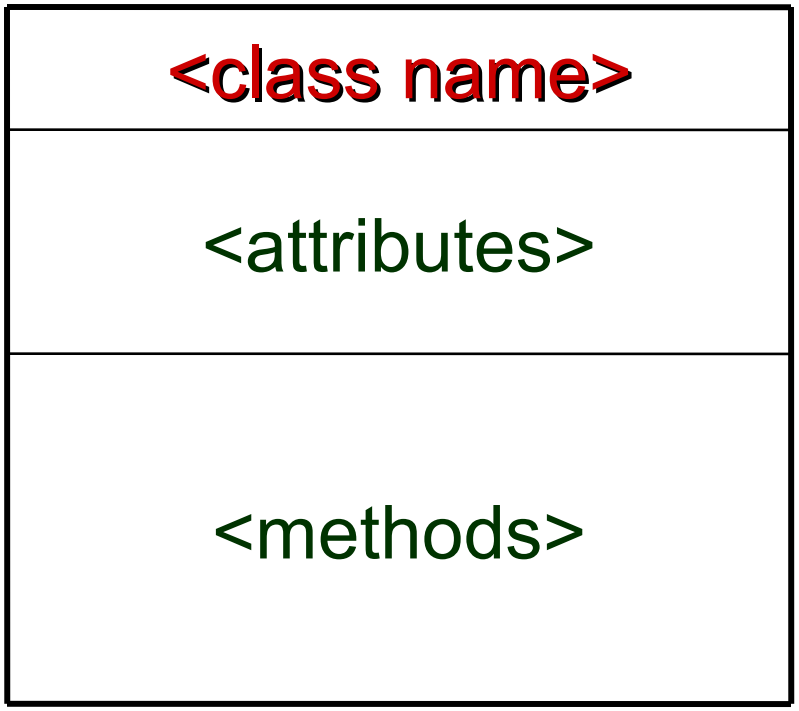


Class Diagram

- Used to describe the association, generalization, and aggregation relationships among classes
- Used to show the features of classes, principally the attributes and operations of each class
- Used throughout the software development lifecycle

Class Design



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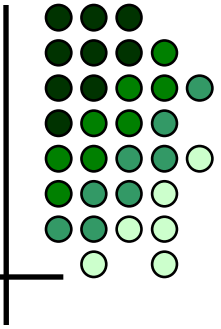
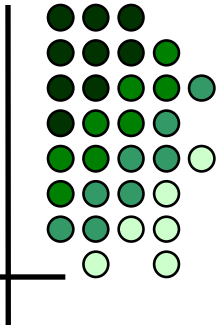


Class Name

- A descriptive name given to a class
- Follows the same naming scheme as variable names

Class Design



Attribute / Properties

- Specify the data that can be held in the instances of the class

<variable_name> : <data_type>

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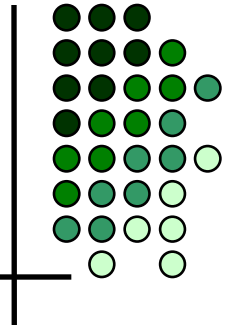

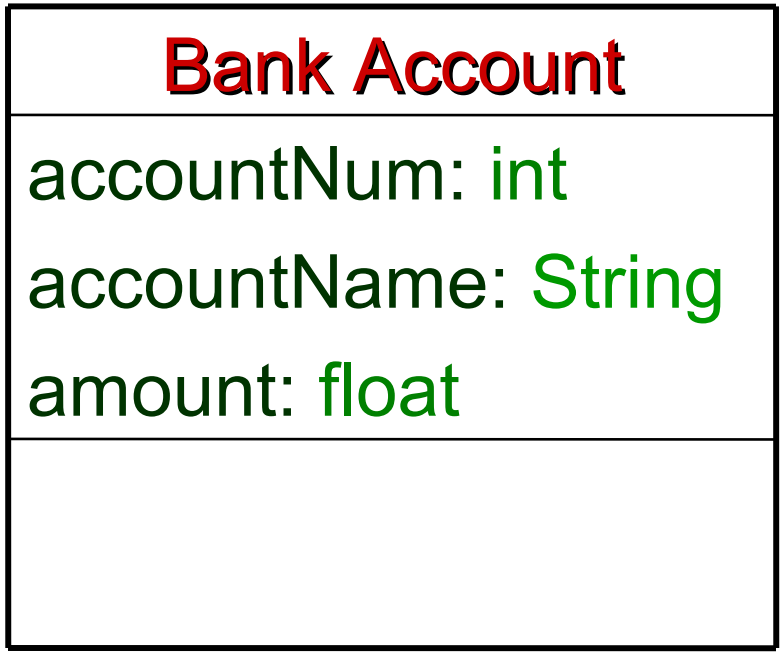

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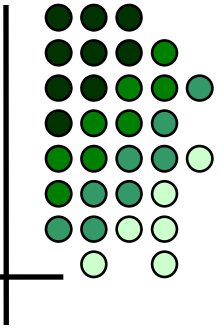
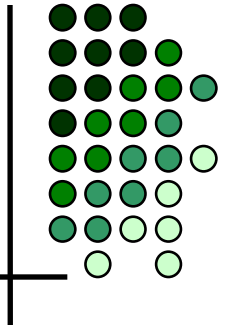


Methods / Operations

- Specify ways of accessing or manipulating the data stored in the objects of a class

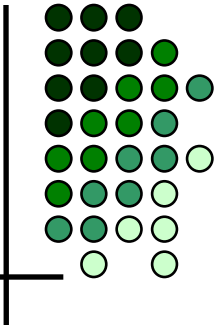
<method name> (<parameter type1> <parameter name1>,
<parameter type2> <parameter name2>,
. . .) : <return type>

Class Design



BankAccount
accountNum: int accountName: String amount: float
getAmount() : float setAmount(float amt) : void computeInterest() : float

Class Design



Access Modifiers

- Specify the access levels of properties and methods
  - ***Public (+)***
  - ***Private (-)***
  - Protected (#)
  - Default (no symbol)

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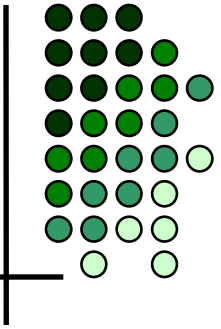

Public Access Modifier

- Used when the attribute or method defined is allowed to be accessed directly by any other object
- As a good design rule, attributes are NOT public

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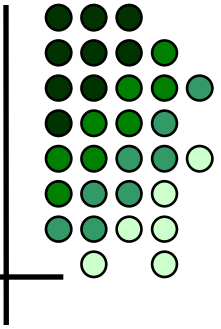

Private Access Modifier

- Used when an attribute or method should only be accessible by the object itself (not by any other object)
- Attributes are usually private
- Some methods may be defined private, if they just perform some actions in support of some behavior

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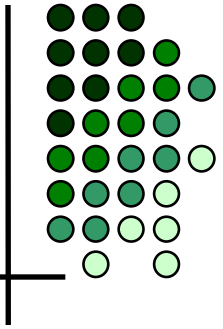
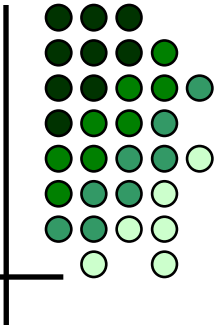


BankAccount
-accountNum: int -accountName: String -amount: float
+getAmount() : float +setAmount(float amt) : void +computeInterest() : float

Class Design



- Getters
  - Methods used to retrieve the values of properties
  - Method name starts with “get” followed by the name of the property
  - Does not have any parameters
  - Return type is the data type of the property

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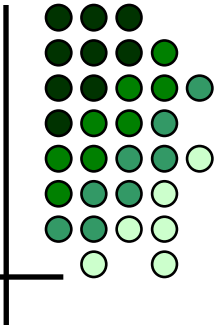

BankAccount
-accountNum: int -accountName: String -amount: float
+getAccountNum(): int +getAccountName(): String +getAmount() : float

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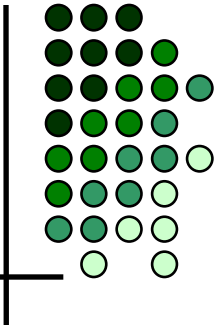

- Setters
  - Methods used to set the values of properties
  - Method name starts with “set” followed by the name of the property
  - Contains a single parameter having the data type of the property
  - Has a void return type

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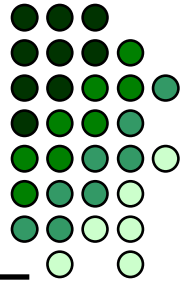
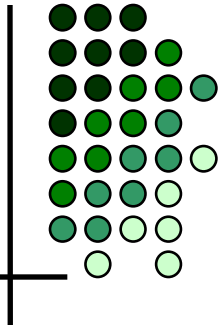


BankAccount
-accountNum: int -accountName: String -amount: float
+setAccountNum(int acctNum): void +setAccountName(String accountName): void +setAmount(float amt) : void

Class Design



BankAccount
-accountNum: int -accountName: String -amount: float
+getAccountNum(): int +getAccountName(): String +getAmount() : float +setAccountNum(int): void +setAccountName(String): void +setAmount(float) : void +computeInterest() : float

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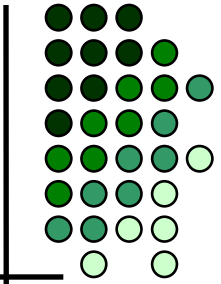

- A car is one of man's most important innovations. They are created by different car manufacturers and each one has a model number to identify them from other cars. Cars come in different colors and styles and differ in weight basing on its components. Because of its engine, some cars are able to go faster than others. To use the car a driver would have to start the car. The driver can then steer the car to allow it to move from one place to the other. Once the driver has arrived at his destination he can simply turn off the car.

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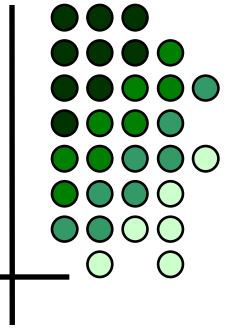

- You are required to create a program that will retrieve the average of a set of numbers.

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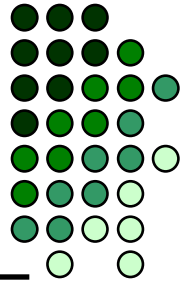

- You are required to create a program that will generate the GPA of a student. The GPA can be calculated using the GPE of each subject that a student is enrolled in. The GPE is based on the grade of a student.

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