Object Oriented Programming

Week 5 Part 1
Interfaces

Lecture

- Definition of Interfaces
- Value of interfaces

Interfaces in Programming

Interfaces

- Interfaces are a point where two systems, subjects, organization, etc, meet and interact
- Examples
  - The shore is where the sea and the land interface
  - The shop counter with the interface between customers and shop owners
  - The driver's controls are the interface between the car and driver
  - The skin is the interface between a person and the world

Programming Interfaces

- Programming interfaces are where two computer systems interact
- Examples
  - The commands that run a printers
  - The commands that run the display
  - The procedures to provide letters from the keyboard
  - The protocols for exchanging interface between computers

Interfaces are Contracts

- Interfaces give the program a guarantee about the user of a program
  - They specify the protocol for using a module
  - They indicate the way a feature of a program is used
- Interfaces provide stability as circumstances change

Examples

- In C, the .h file specifies the interface to a module
  - It describes the variables and functions used by the module
- In Java, the class definition specifies the interface to a class
  - It indicates the behavior as well as the protocol
- API's (Application Program Interfaces) are specification of the programming interface

Interfaces provide stability

- From outside a module only the input and the output matter
  - As long as the interface is stable, those using it need not change their code
  - The internals can change without changing anything outside.

Examples of Interfaces

- Computer Human Interfaces
  - Graphical User Interface: point and click
  - Command Line Interface: type commands
  - Computer Languages: write programs
- Computer Computer Interfaces
  - World Wide Web: HTTP and HTML
  - Standard Input and Output

Try it

- Name three interfaces: share them with the class

Interfaces and “Interfaces”

- The public method and fields provide the interface to a class
  - As long as the public methods and fields do not change, those using the class need not worry about how it is implemented
- In addition, Java provides a “interface” construct
  - It is similar to a class
  - It defines a type
  - It can be added as part of the definition of a class
    - Like a superclass
  - It can define a hierarchy