



CSE 143

Lecture 1

Objects

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Object: iPod



(ok, so it's an old iPod)

<http://www.takeitapart.net/photos/apple_1gen_ipod/>

Object: iPod

- Why did MP3 players, like the iPod, replace CD players?

- MP3 players are more resistant to skipping
- MP3 players are smaller

Both true for years before MP3 players became mainstream

- MP3 players can store more music (a person's entire library!)

The important reason!

Object Motto

An object encapsulates state and behavior

An object encapsulates state and behavior

- **State:** what an object knows
 - Data, usually in the form of variables
 - MP3 player's state
 - Am I on or off?
 - Am I playing music?
 - What song am I playing?
 - How loud is my volume?
 - How many times have I played *I'm On A Boat*?
 - etc

An object encapsulates state and behavior

- **Behavior:** what an object does
 - Actions, usually in the form of methods
 - MP3 player's behavior
 - Turn on/off
 - Play music
 - Pause music
 - Increase volume
 - Increase bass
 - etc

An object encapsulates state and behavior



How many of you know how to use this?
How many of you know how to *build* this?

<http://www.takeitapart.net/photos/apple_1gen_ipod/>

An object encapsulates state and behavior



Yuck. Someone call the Geek Squad.

<http://www.takeitapart.net/photos/apple_1gen_ipod/>

An object encapsulates state and behavior

- Client view
 - Knows what an object can do
 - MP3 client view
 - Can turn object on/off, start music, increase volume, etc
- Implementer/implementation view
 - Knows exactly how an object works
 - MP3 implementer view
 - Can see exactly how a “turn on” signal affects all parts of the object
- Switching back and forth between these two viewpoints can be confusing at first. But you’ll get used to it.

An object encapsulates state and behavior

- **Encapsulation:** hiding the implementation details from clients
 - The client should only know what is necessary to *use* the object
 - To understand, it might help to pretend that all clients are malicious
 - They will use everything you give them to try to break your object
 - The MP3 player is well encapsulated
 - none of us has a clue about exactly how it works
 - ...and yet we can use it without difficulty
 - ...and we haven't figured out how to make it do weird things, like playing songs backwards