Java and IRC

Making a Java IRC Bot With
The PircBot Framework

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What Is IRC?

- IRC stands for "**Internet Relay Chat**"
- Created by Jarkko Oikarinen in 1988 and still growing in popularity
- An IRC server allows people to chat in channels (rooms or groups), or privately
- People from all over the world can use it
- IRC servers can be joined together to provide vast networks with thousands of users

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Using IRC

- A user runs a **client** program to connect to the IRC **server**
- The client program allows you to send and receive messages to and from other users
- Some popular IRC clients are: -
  - mIRC
  - BitchX
  - xchat

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Nicks, Channels and Operators

- Each user must have a unique nickname
  - Commonly referred to as a "nick"
  - Must not contain certain characters, e.g. spaces
- Channel names must start with # or &
- Some users may be channel operators
  - Can kick other users out of their channel
  - Can "op" and "deop" other users in the channel
  - Can ban users from entering the channel

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IRC Protocol

- The IRC protocol is text-based
- RFC 1459 defines how messages are sent from client to server and server to client
- TCP sockets are used for connecting
- Some IRC servers will support extra commands that are not in RFC 1459
- The protocol is asynchronous in nature

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What Is an IRC Bot?

- Bot is short for "robot"
- An IRC Bot is a special type of IRC client
- Does not require a human user
- Often responds automatically to certain events
- One analogy is to think of an IRC Bot as a normal IRC client, but where the human user has been replaced by a program!

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What Can IRC Bots Do?

- Tell people what the time is
- Pass messages on to other users
- Display information from TV listings
- Perform simple mathematics
- Send and receive files
- Monitor channels to generate statistics
- ... anything you want!

Using Bots Sensibly

- Never annoy other users with your Bot
- Only place your Bot in channels where it may be of use or amusement
- Bots should only speak when spoken to!
- Make the purpose of your Bot clear
- Make it clear that you own your Bot
- Never try to pretend that it's not a Bot!

What is PircBot?

- A framework for writing IRC Bots with Java
  - Simplifies the task of writing an IRC Bot
  - No need to worry about the underlying protocol
  - Very simple Bots can be written within minutes!
- Event-driven architecture
  - Can make a Bot that responds to certain events

Where Can I Download PircBot?

- The PircBot homepage
  - http://www.jibble.org/pircbot.php
    - Documentation
    - changelog
    - PircBot FAQ
    - Examples of some Bots that use PircBot
- Download the zip file
  - Contains a file named pircbot.jar
  - Also contains a directory full of documentation

Extending PircBot

- To use PircBot, you must import its package
  - **import org.jibble.pircbot.*;**
- PircBot is an abstract class
  - You cannot instantiate it
  - You must extend it and inherit its functionality
  - You can override some of the methods in the PircBot class to respond to certain events

An Example: SimpleBot

```
import org.jibble.pircbot.*;

public class SimpleBot extends PircBot {
    public SimpleBot() {
        setName("SimpleBot");
    }
}
```

Connecting To an IRC Server

```
public static void main(String[] args) {
    SimpleBot bot = new SimpleBot();
    bot.setVerbose(true);
    try {
        bot.connect("compsoc1.ukc.ac.uk");
    }
    catch (Exception e) {
        System.out.println("Can't connect: " + e);
        return;
    }
    bot.joinChannel("#bots");
}
```

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Some Notes About SimpleBot

- SimpleBot.java
  - The setName method is inherited from the PircBot class and sets the nick that will be used when the Bot joins an IRC server
- Connecting to an IRC server
  - setVerbose(true) causes everything to be printed out as it arrives from the IRC server
- Each method in the PircBot class is fully described in the provided API documentation

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Making SimpleBot Tell the Time

- In your SimpleBot class, override the onMessage method: -

```
public void onMessage(String channel, String sender,
                      String login, String hostname,
                      String message) {

    if (message.equalsIgnoreCase("time")) {
        String time = new java.util.Date().toString();
        sendMessage(channel, sender + ": " + time);
    }

}
```

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Running Your IRC Bot

- pircbot.jar contains the classes for PircBot
- Add this file to your classpath when you compile or run your IRC Bot manually, e.g.

```
javac –classpath pircbot.jar;. *.java
java –classpath pircbot.jar;. SimpleBot
```

- Note: Unix users should use ":" instead of ";"

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Other Built-in PircBot Features

- DCC send/receive files
- DCC chat
- Coloured messages
- Maintain lists of joined channels and users
- List all channels on a server
- Many event-driven methods that may be overridden
  - onConnect, onDisconnect, onJoin, onOp, etc.

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Rejoining a Channel When Kicked

```
public void onKick(String channel, String kickerNick,
                   String login, String hostname,
                   String recipientNick, String reason) {

    if (recipientNick.equalsIgnoreCase(getNick())) {
        joinChannel(channel);
    }

}
```

- Note that we only attempt to rejoin the channel if it was us that was kicked

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Reconnecting to an IRC Server

```
public void onDisconnect() {

    while (!isConnected()) {
        try {
            reconnect();
        }
        catch (Exception e) {
            // Couldn't reconnect.
            // Pause for a short while before retrying?
        }
    }

}
```

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PircBot Ident Server

- Some IRC servers require you to connect from a machine that runs an Ident Server
- PircBot can emulate the functionality of an Ident Server if you do not already run one
- Provides the IRC server with your Bot's login when it asks for it

```
bot.startIdentServer();
```

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PircBot Flood Protection

- Some IRC servers disconnect clients that send too many messages too quickly.
- PircBot queues most outgoing messages.
- Queued messages are sent with a small delay between them to prevent "flooding"
- You can get the current size of this queue by calling the getOutgoingQueueSize() method

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Colors and Formatting Examples

```
String chan = "#bots";

sendMessage(chan, Colors.BOLD + "Hello!");
        Hello!

sendMessage(chan, Colors.RED + "Red text");
        Red text

sendMessage(chan, Colors.BLUE + "Blue text");
        Blue text
```

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Further Text Formatting

```
sendMessage(chan, Colors.BOLD + Colors.RED +
                            "Bold and red");
        Bold and red

sendMessage(chan, Colors.BLUE + "Blue " +
                Colors.NORMAL + "normal");
        Blue normal
```

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DCC Send File

```
File file = new File("c:/stuff/elvis.mp3");
String nick = "Dave";
int timeout = 120000;

dccSendFile(file, nick, timeout);
```

- Target client must be able to establish a TCP connection to your Bot to receive the file

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User List Example

- onUserList is called after we join a channel
- This example overrides the onUserList method and simply prints out each nick

```java
public void onUserList(String channel, User[] users) {
    for (int i = 0; i < users.length; i++) {
        User user = users[i];
        String nick = user.getNick();
        System.out.println(nick);
    }
}
```

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Multiple Server Support in PircBot

- An individual instance of a subclass of PircBot can only join one IRC server at a time
- Multiple server support can be achieved by creating multiple instances
  - Create a class to control a Collection of PircBot objects and allow them to interact

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IRC Bots Based On PircBot (1)

- ComicBot
  - Creates comic strips out of things that people say

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IRC Bots Based On PircBot (2)

- Monty
  - The first ever PircBot!
  - 'Learns' from what it sees other people saying
  - Dictionary and thesaurus lookup feature
  - Can remind people to do things after a set time
  - Shows TV schedule listings
  - Performs google searches
  - Calculates results of mathematical expressions
  - etc.

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IRC Bots Based On PircBot (3)

- SocialNetworkBot
  - Attempts to produce graphical representations of "who talks to who" on IRC channels

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An IRC Client Based On PircBot

- ScreenIRC
  - IRC client with a Swing GUI
  - Can be 'detached' from a server and reconnected without appearing to have ever left

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Final Words…

- If you want to make your own IRC Bot that uses PircBot, then remember that these slides only provide a briefest glimpse into what you may need to know
- Refer to the API documentation that is included inside the zip file
- A good starting place is to read the documentation for the PircBot class

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