TINKER ACADEMY

Programming Using Java

Handout 8: Build Player Info and Teleporter Plugins (Minecraft Plugin Development)

Note your Student ID. You will need to use it throughout the Course.

Setup Instructions In Classroom

Connect to the Local Class Network

1. Select WiFi “TINKER ACADEMY”
2. This network has only LOCAL access and does NOT connect to the internet

Update the Course

1. Ensure you are connected to “TINKER ACADEMY”
2. Restart the VM. Login into the VM.
3. Open Firefox in the VM
4. Your Instructor would tell you what to type in the browser. (Typically it is 192.168.1.5)
5. You should see a page with a list of entries.
6. Click on CourseUpdate<Date>.zip. This will download CourseUpdate<Date>.zip onto your VM
7. Open Nautilus. Click on Downloads. You should see the file CourseUpdate<Date>.zip
8. Right Click on CourseUpdate<Date>.zip. Select Extract Here.
9. Open the extracted folder
10. Double click Course Update. Select “Run” in the window.

Update the Course (Alternate Approach In Class Using USB)

1. Borrow a USB drive from the Instructor
2. If you are on VirtualBox
    a. Click on Devices in the Top level Menu
    b. Select Drag ‘n’ Drop
    c. Select Bidirectional
3. If you are on VirtualBox (Another Way)
    a. Shutdown Virtual Machine
    b. Click on VM in the VirtualBox Manager
    c. Click on the Settings
    d. Click General
    e. Click Advanced Tab

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    f. Select “Bidirectional” under Drag ‘n’ Drop
    g. Click OK
    h. Start Virtual Machine
4. If you are on VMWare
    a. Open the virtual machine settings editor (VM > Settings),
    b. Click the Options tab
    c. Select Guest isolation.
    d. Deselect Disable drag and drop to and from this virtual machine
5. Open Nautilus, Click on Desktop
6. Drag the file CourseUpdate<Date>.zip from Windows or Mac onto Desktop in your Virtual Machine
7. Right Click on CourseUpdate<Date>.zip. Select Extract Here.
8. Open the extracted folder
9. Double click Course Update. Select “Run” in the window.
10. Eject the USB Drive and hand it back to the Tinker Academy instructor

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Setup Instructions At Home

Connect to your Home WiFi Network

Updating the Course (Using Wifi)

1. Make sure you are on the Home WiFi Network.
2. Click the “Setup” folder in “Nautilus” under “Bookmarks”
3. Double click “Course Update”. Choose “Run”.
   You should see a message “Update course in progress”
   If you see a window popup with the message “update course failed”.
   Hop onto Skype, and request help in the class chat group.
   And send an email to classes@tinkeracademy.com with your name and student ID.
4. Wait for a few minutes (to allow for the update to complete)
5. Follow the instructions in this handout (last 2 pages) on the quiz and homework steps.

Submitting Quiz and Homework

1. Make sure you are on the Home WiFi Network.
2. Click the “Setup” folder in “Nautilus” under “Bookmarks”
3. Double click “Course Submit”. Choose “Run”.
   If you see a window popup with the message “submit course failed”.
   Hop onto Skype, and request help in the class chat group.
   And send an email to classes@tinkeracademy.com with your name and student ID.

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Virtual Machine Installation

Installing the Virtual Machine (VM)

1. Borrow the USB drive from your Tinker Academy instructor
2. Create the folder “tinkeracademy” (without the quotes) under Documents using Finder or Windows Explorer. Type it in *exactly* as indicated.
3. Copy the folder “installers” from the USB drive to under “tinkeracademy” using Finder or Windows Explorer
4. Eject the USB Drive and hand it back to the Tinker Academy instructor
5. Locate the VirtualBox installer under “tinkeracademy” using Finder or Windows Explorer

If your Laptop is	Double click on
Windows 7	VirtualBox-4.3.12-93733-Win.exe
Windows 8	VirtualBox-4.3.14-95030-Win.exe
Mac	VirtualBox-4.2.26-95022-OSX.dmg

6. Install the VirtualBox application
7. Congratulations, You completed a major milestone. Give yourself a pat on the back :)

Importing the Virtual Machine (VM)

1. Locate the Virtual Machine “tinkeracademy.ova” under “tinkeracademy”
2. Double click on “tinkeracademy.ova”. You should get the import screen in VirtualBox with an “Import” Button. Click on the “Import” button to Import the Virtual Machine.

Starting the Virtual Machine (VM)

1. Once the Import is complete and successful, you should see the VM “TinkerAcademy” in the side panel in VirtualBox.
2. If it says “Powered Off” click on the Start Button (Green Arrow) in the VirtualBox Toolbar. This will start the VM.
3. If it says “Running” click on the Show Button (Green Arrow) in the VirtualBox Toolbar. This should display the VM window.
4. Once the VM starts up you will be presented with a login screen. Type in “password” without the quotes. Type it in exactly as indicated and hit “Enter”.
5. Once the login is completed you should see a Desktop with a few icons. The Screen might go fuzzy for a few seconds before displaying the Desktop. *That is ok.*
6. Congratulations. You are now running Linux within your laptop.

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7. Double click on the “Firefox” icon in the Sidebar. This should launch Firefox. Verify you have network access. Close “Firefox”

Launching the Virtual Machine in Full Screen

1. Use the VirtualBox menu View->Switch to Fullscreen to switch the VM to fullscreen mode
2. Use the same VirtualBox menu View->Switch to Fullscreen to switch the VM back out of fullscreen mode

Shutting Down the Virtual Machine

1. Click on the red close window button (to the top left on a Mac, top right in Windows).
2. You will prompted with a confirmation message asking if you want to “Power Off” the machine. Click the button to confirm power off.
3. In a few minutes the VM will shut down and you should see the VirtualBox side panel with the “Tinker academy” VM indicating “Powered Off”.

Restarting the Virtual Machine

1. Start VirtualBox
2. Click on the VM “TinkerAcademy” in the VirtualBox side panel.
3. Click on the Start Button (Green Arrow) in the VirtualBox Toolbar. This will start the VM.
4. Once the VM startup you will be presented with a login screen.

Right Click in VM on Mac

1. Open System Preferences, Trackpad
2. Enable “Secondary Click”, Toggle the small arrow to the right and select “Click with two fingers”.

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Getting Ready to Program

Import StarterPack8.zip
We will be using StarterPack8.zip for this class.

Click on StarterPack8.zip under “Courses”. Right Click. Select “Extract Here”
Start Eclipse from Desktop. Right Click over Package explorer. Select “Import”. Browse and select the extracted folder “StarterPack”. Click “Finish” to complete the Import.

Structure of StarterPack8.zip
StarterPack8 is an Eclipse Java Project. The Project has

1. A Java Source File called “StarterPack8.java”
2. A Java Source File called “PlayerUtils.java”
3. Project references to the Java Runtime Environment 1.6 System Library.
4. Project references to the Minecraft Plugin Library.
5. The Bukkit configuration file called plugin.yml

Run the Program

1. Click over project name “StarterPack8”.
2. Toggle the src folder to select StarterPack8.java
3. Right Click. Select “Run As…”. Select “Java Application”.
   The text “Starter Pack 8” should be displayed in the Console window (bottom)

If the “Console” window is not visible click on the “Window” Toolbar (top), select “Show View”, select “Console”. If all else fails, click on the “Window” Toolbar (top), select “Reset Perspective…” click “OK”. This will put Eclipse back into the default Factory state. You can now use “Show View” to view the “Console”.

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Plugins

Bukkit is a minecraft server that supports adding plugins.

What is a Bukkit **plugin**?

A Bukkit plugin is packaged code that is added to the Bukkit server.

Plugins use the Bukkit API to add more features of the game.

Every Bukkit Plugin is a subclass of the Bukkit JavaPlugin class.

Bukkit plugins are packaged as jars.

What is **jar**?

A jar is a package file format.

A jar is fundamentally a zip archive of Java classes, and other resources such as images, text files, plugin yml files etc.

Where are plugins stored?

Bukkit plugins are stored on the Bukkit Minecraft Server.

1. Open Nautilus
2. Open the Documents folder
3. Open the minecraft folder
4. Open the server folder
5. The server contains a folder called plugins

All plugins will be copied into this plugins folder.

We will be using a Linux shell script called setup_plugin.sh

What is **a shell script**?

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Linux, Unix, Mac OSX and other Unix like operating systems provide a special “shell” program to help users access the operating system using commands.

A shell script is a program that is run by the Linux shell.

Linux has many shell programs.

The most popular shell in Linux is called “bash”. bash is based on the earlier Bourne shell. The word bash is an acronym and stands for the Bourne again shell.

Where is the minecraft world stored?

Minecraft is played in a world. The world is created and updated by the Bukkit Server.

Bukkit stores the Minecraft world in the following folders under server

1. world
2. world_nether
3. world_the_end

The script “Reset Minecraft World” under Setup will reset the minecraft world.

Run “Course Update” to generate “Reset Minecraft World” (if it does not already exist)

Presetup of the Minecraft Server

You would need to make sure that the Tinker Academy VM is using Bridged network before starting the Minecraft Server.

1. Stop the VM
2. Click on Settings
3. Click on Network
4. Attached To: Bridged Network
5. Click OK
6. Restart the VM

Once the VM has restarted

1. Right click over the Network Icon (top right with the ↑↓) in the Tinker Academy VM.
2. Select Connection Information and note down the IP Address

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We will need the IP Address to connect the client to the Server

Starting the Minecraft Server

The Bukkit Minecraft Server needs to be started before a Minecraft Client can access the Server.

The Bukkit Minecraft Server installed on your Tinker Academy VM is version 1.6.4.

The Minecraft Client profile needs to be 1.6.4 to access the Server.

To Start the Minecraft Server

1. Open Terminal
2. Type in the following

cd
cd Documents
cd minecraft
cd server
./start_minecraft_server

The server should prepare the world startup with a message Info: [DONE]

Updating the Minecraft Client Profile

The following steps will update the Minecraft Client Profile to 1.6.4

The Minecraft Client can be launched from anywhere. It need not be launched from within the VM.

You would need to be on a reliable WiFi to setup the Client Profile and launch the client successfully.

1. Launch Minecraft Client from Windows or Mac
2. Once the Minecraft Launcher
3. Click Edit Profile if you want to change your current profile OR Create New Profile to create a new profile

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4. Update Use version: to release 1.6.4
5. Save Profile
6. Click on Play
7. The Minecraft Client might download files as part of Setup
8. Wait for the Minecraft 1.6.4 to Startup

Connecting to the Bukkit Minecraft Server

1. Click on Multiplayer
2. Click on Direct Connect
3. Type in the IP address from Connection Information
4. Select Join Server
5. If the Minecraft Server is running on the IP address and client can connect to it, you should see the Logging in message
6. In a few moments you should be logged in into Minecraft

Implementing the PlayerInfo and Teleport Plugin

In this section, we will do a roundup of the different parts and complete and run the plugin in Steps.

Step 1: Complete the plugin.yml

Complete the plugin.yml

1. Open Eclipse
2. Select project “StarterPack8” in Package Explorer
3. Double click plugin.yml. It should open up in a text editor

1	name: MyPlayerUtils
2	version: 1.0.0
3	description:

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4	author: student@tinkeracademy.com
5	
6	main: com.tinkeracademy.StarterPack8
7	
8	commands:
9	playerinfo:
10	description: Builds a Minecraft House made of wood
11	

Line #1 is the name of the plugin
Line #2 indicates the version
Line #3 is the plugin description
Line #4 is the plugin author
Line #6 indicates the Java class file that subclasses org.bukkit.plugin.java.JavaPlugin
Line #8 starts the commands section

4. Add a new command playerinfo on Line #9
5. Add a description Provides Player Info on Line #10
6. Add a new command teleport on Line #11
7. Add a description Teleports a player on Line 12
8. Save your changes

Step 2: Update the plugin subclass

In Step 2, you will update the plugin subclass (StarterPack8) to process the new command

1. Open Eclipse
2. Select project “StarterPack8” in Package Explorer
3. Double Click StarterPack8.java source file
4. Replace the contents of the onCommand method with the code below.

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```
                if (label.equalsIgnoreCase("playerinfo")) {
                        if (sender instanceof Player) {
                                Player player = (Player) sender;
                                String message =
PlayerUtils.buildPlayerInfoMessage(player);
                                player.sendMessage(message);
                                return true;
                        }
                } else if (label.equalsIgnoreCase("teleport")) {
                        if (sender instanceof Player) {
                                Player player = (Player) sender;
                                Location playerLocation = player.getLocation();
                                int offsetX = extractInt(args, 0, 0);
                                int offsetY = extractInt(args, 1, 0);
                                int offsetZ = extractInt(args, 2, 0);
                                Location newPlayerLocation =
playerLocation.add(offsetX, offsetY, offsetZ);
                                PlayerUtils.teleportPlayer(player, newPlayerLocation);
                                return true;
                        }
                }
                return false;
```

The code above processes the playerinfo and teleport commands.

playerinfo

The code verifies that the sender is a Player. It then gets the player. The code invokes the static method buildPlayerInfoMessage on PlayerUtils with the input as Player to build the message String. The Player is then sent the message using sendMessage

teleport

The code verifies that the sender is a Player. It then gets the player and the player location. It then attempts to extract the teleport offsetX, the offsetY and the offsetZ which are included as arguments to the command. The code the uses the offsetX, offsetY and offsetZ to calculate a new player location and then invokes the static teleportPlayer method on PlayerUtils to teleport the player to the new Location.

X, Y and Z in Minecraft

Minecraft uses a 3D coordinate system

When looking at a minecraft screen, Y is pointing up and represents the height of objects.

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X points to the right.

Z points **out of the screen towards you.**

Step 3: Add the plugin into the game

1. Open Terminal
2. Type in the following

cd
cd Documents
cd tinkeracademy
cd Courses
cd TA-JAV-1
cd starterpack
cd starterpack8
chmod u+x setup_plugin.sh
./setup_plugin.sh

3. The StarterPack8.jar should now be present in the minecraft plugins folder
4. Run Reset Minecraft World from Setup
5. Restart the minecraft server.
6. Restart the minecraft client

Running the Plugin

Once the Minecraft Client launches

1. Forward slash in the Minecraft Client to view the commands console
2. Type in playerinfo to get player info
3. Type in teleport 0 10 0 to teleport 10 units in the y direction

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That was a LOT we covered!

You completed the Course! Awesome!

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Quiz 8: Build Player Info and Teleporter Plugins (Minecraft Plugin Development)

Make sure you read this Handout!

There are no quizzes for this Handout.

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Homework 8: Build Player Info and Teleporter Plugins (Minecraft Plugin Development)

Make sure you read this Handout!

There is no homework for this Handout.

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