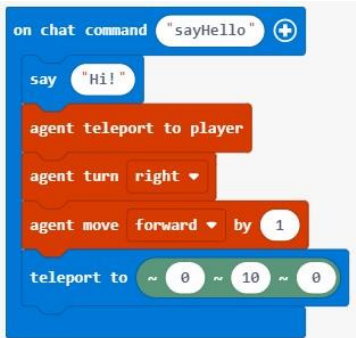## Coding in Minecraft – Advanced Coding Using Python
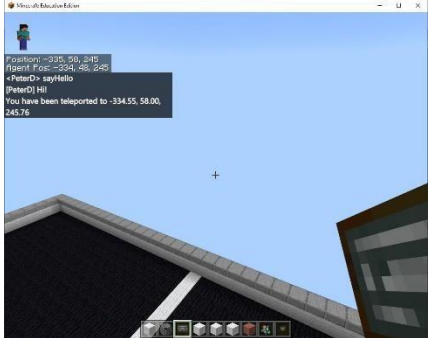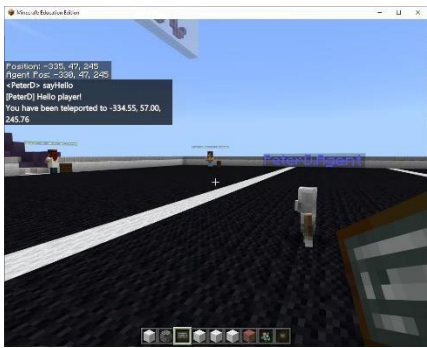## Lesson 3 – Python – Modifying Python code
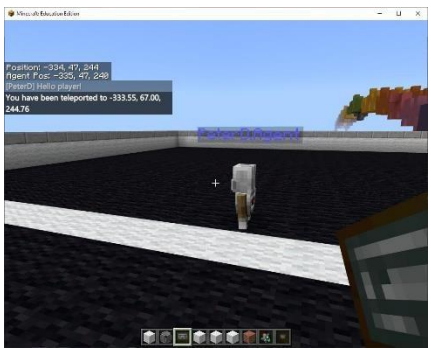## Activity

Instructions

This worksheet is copy of the steps detailed in the Activity in the game to make it easier for you to follow along and try yourself.

Step	Instructions	
1	We have already started to see how Python code compares to block-based coding. Previously we have looked at how Python code compares to block-based coding but we haven't changed any of the Python. We will now start to make changes to Python to and see how this affects our Minecraft world.	
2	We will create a sample program with some simple blocks as detailed below to learn more. The below sample program in Python is the equivalent of the below in MakeCode blocks	

```python
def on_chat():
    player.say("Hi!")
    agent.teleport_to_player()
    agent.turn(RIGHT_TURN)
    agent.move(FORWARD, 1)
    player.teleport(pos(0, 10, 0))
player.on_chat("sayHello", on_chat)
```

3	Notice that the 5 lines of code inside the event handler all call on functions of the player or agent and 4 of these take parameters (the only one not taking a parameter being the agent.teleportToPlayer()).
4	Return to the Minecraft world to run your code by clicking the Green play button and entering the text sayHello in the chat window. Return to the tutorial by pressing the C key on your keyboard or tapping the Agent icon on your screen when finished.
5	You should have noticed that a message saying hi appears, your agent appears and turns right and moves one block forward and you then teleport to 10 blocks above your current position.

6	Change the parameter being passed to the player.say function to "Hello player!" (note: keep the double quotes as this is a string variable).
	
	``python
	def on_chat():
	    player.say("Hello player!")
	    agent.teleport_to_player()
	    agent.turn(RIGHT_TURN)
	    agent.move(FORWARD, 1)
	    player.teleport(pos(0, 10, 0))
	player.on_chat("sayHello", on_chat)
	``

7	Return to the Minecraft world and open the chat window and issue the sayHello command. Notice that a chat message reflecting the change you made in Python is now displayed (Hello Player!). Return to the tutorial by pressing the C key on your keyboard or tapping the Agent icon on your screen when finished.

8	On line 4 delete the word RIGHT_TURN from the agent.turn(RIGHT_TURN).
	Replace it with LEFT_TURN.
	These are the 2 directions the Agent can turn (Left and Right).

	``python
	def on_chat():
	    player.say("Hello player!")
	    agent.teleport_to_player()
	    agent.turn(LEFT_TURN)
	    agent.move(FORWARD, 1)
	    player.teleport(pos(0, 10, 0))
	player.on_chat("sayHello", on_chat)
	``

9	Return to your Minecraft world and run the sayHello command again and notice this time your agent will turn left rather than right.
	Return to the tutorial by pressing the C key on your keyboard or tapping the Agent icon on your screen when finished.
10	Take a look at line 5

	``python
	agent.move(FORWARD, 1)
	``

	This line of Python is the code which will move the agent in a certain direction by a number of blocks.
	The move method takes 2 parameters - the first one being the direction to move and the second one the number of blocks to move.
11	Firstly lets look at the first parameter the

	``python
	FORWARD
	``

	This is one of 6 directions the agent can move in - FORWARD, BACK, DOWN, LEFT, RIGHT, UP.
	Delete the word FORWARD and enter the text RIGHT.

	``python
	def on_chat():
	    player.say("Hello player!")
	    agent.teleport_to_player()
	    agent.turn(LEFT_TURN)
	    agent.move(RIGHT, 1)
	    player.teleport(pos(0, 10, 0))
	player.on_chat("sayHello", on_chat)
	``

12	The second parameter (the one after the comma) is how many blocks to move and is a number type.
	
	Change this number to 5 to move the agent 5 blocks to the right.
	
	``python
	def on_chat():
	    player.say("Hello player!")
	    agent.teleport_to_player()
	    agent.turn(LEFT_TURN)
	    agent.move(RIGHT, 5)
	    player.teleport(pos(0, 10, 0))
	player.on_chat("sayHello", on_chat)
	``

13	Return to your Minecraft world and run the sayHello command again and check that the Agent now moves 5 blocks to the right. Return to the tutorial by pressing the C key on your keyboard or tapping the Agent icon on your screen when finished.
14	You should have noticed that the Agent now moves 5 blocks to the right.
15	The final line of code teleports the player to a position defined by a set of relative coordinates. The teleport function of the player takes a position variable to tell it where to teleport the player to. This coordinate is created using the pos function which takes 3 parameters - the X, Y and Z coordinates.

16	Change the coordinates to be the relative coordinates of 1 20 -1 by changing the 3 number parameters in the pos function to 1, 20, -1.
	
	``python
	def on_chat():
	    player.say("Hello player!")
	    agent.teleport_to_player()
	    agent.turn(LEFT_TURN)
	    agent.move(RIGHT, 5)
	    player.teleport(pos(1, 20, -1))
	player.on_chat("sayHello", on_chat)
	``

17	Return to your Minecraft world and run the sayHello command again and take note of what happens. Return to the tutorial by pressing the C key on your keyboard or tapping the Agent icon on your screen when finished.
18	Notice this time that you are teleported to a position 1 block to your left, 1 block backwards and 20 blocks above your position (depending on what way you are looking!)
19	Return to the game and move onto the next Non Player Character