The MagPi ESSENTIALS

[CHAPTER FOUR]
THE MINECRAFT
LAVA TRAP

Program a game in Minecraft and see
whether you can escape the Lava Trap!

Go find the block

You're going to create a mini-game. A lava pit will instantly appear and Steve will be put at the centre of it; soon, the block he's standing on will disappear so he will have to move, but hang on: all the blocks keep disappearing!

Welcome

The first task is to start your program and get "Welcome to the Lava Trap" to appear on the screen:

01. Start Minecraft by clicking Menu > Games > Minecraft and create a new world.

02. Press ESC to go back to the Minecraft menu but leave the game playing.

03. Open IDLE by clicking Menu > Programming > Python 3.

04. Use File > New Window to create a new program and save it as **lavatrap.py**.

05. Type the following code into the program to import the modules you'll need:

```
import mcpi.minecraft as minecraft
import mcpi.block as block
from time import sleep
```

06. Create a connection to Minecraft using this code:
```
mc = minecraft.Minecraft.create()
```
07. Post a message to the chat window:
```
mc.postToChat("Welcome to the Lava Trap")
```
08. Run your program by clicking Run > Run Module.

You should see your message appear in the Minecraft chat window.

Lava

Update your program so it creates the pit of lava under Steve,
by adding the following code:

01. Put a 3 second delay into your program so that you can see what's
going on:
```
sleep(3)
```
02. Find out where Steve is in the world:
```
pos = mc.player.getTilePos()
```
03. Use **setBlocks()** to create an area of **STONE** two blocks below
Steve for the **LAVA** to sit on:
```
mc.setBlocks(pos.x - 5, pos.y - 2, pos.z - 5,
    pos.x + 5, pos.y - 2, pos.z + 5,
    block.STONE.id)
```
04. Then create the **LAVA** under Steve:
```
mc.setBlocks(pos.x - 5, pos.y - 1, pos.z - 5,
    pos.x + 5, pos.y - 1, pos.z + 5,
    block.LAVA.id)
```
05. Run your program by clicking Run > Run Module or by pressing F5.

There will be a 3 second delay before the lava pit appears and Steve burns…
Create a diamond block in the middle for Steve to stand on:

01. Create the diamond block:
```
mc.setBlock(pos.x, pos.y - 1, pos.z, block.DIAMOND_BLOCK.id)
```
02. Run your program. Steve will be stuck in the middle of the lava pit.

Make a game

Update your program to make blocks under Steve disappear:

01. Post messages to the chat screen to warn the player the game is about to start:
```
mc.postToChat("Get Ready")
mc.postToChat("Blocks under you will keep disappearing")
sleep(3)
mc.postToChat("Go")
```
02. Create a variable called **gameover** and set it to False. It will be set to True at the end of the game:
```
gameover = False
```
03. Create a loop which will continue until the game is over:
```
while gameover == False:
```
04. Indented under the while loop, add the code to get Steve's position:
```
p = mc.player.getTilePos()
```
05. Turn the block under Steve to **OBSIDIAN** as a warning and wait for 2 seconds:
```
mc.setBlock(p.x, p.y - 1, p.z, block.OBSIDIAN.id)
sleep(2)
```
06. After the warning, turn the block to **AIR**. If Steve is standing on it, he's going to be in the lava pit:
```
mc.setBlock(p.x, p.y - 1, p.z, block.AIR.id)
sleep(0.5)
```
07. Run the program. The game will start and you'll have to put blocks down in the lava pit to escape, as otherwise they're going to disappear and Steve will fall in.

Game over

The game is over if Steve falls into the lava. You need to modify your program to check if he has fallen into the lava and put a message on the screen:

01. Use an if statement to see if Steve's height (y) is not equal to where he started. If it is, set the **gameover** variable to True:
```
if p.y != pos.y:
    gameover = True
```

02. Put a message on the screen to let the player know they have been caught in the lava trap:
```
mc.postToChat("Game over.")
```
03. Run your program and see how long you can stay out of the lava.

Next steps

This game is just the start: can you finish it? Here are some challenges:

- Make the game harder.
- Make a better game arena, perhaps building a stadium or walls around it so Steve can get out.
- Add points to the game; each time Steve doesn't fall in, he gets a point.
- Change the game so it starts easy but gets harder the longer you play.
- Add a two-player (or even multiplayer!) option.

Above You'll have to put blocks down into the lava to escape

lavatrap.py

```python
import mcpi.minecraft as minecraft
import mcpi.block as block
from time import sleep
mc = minecraft.Minecraft.create()
mc.postToChat("Welcome to the Lava Trap")

sleep(3)
pos = mc.player.getTilePos()
mc.setBlocks(pos.x - 5, pos.y - 2, pos.z - 5,
        pos.x + 5, pos.y - 2, pos.z + 5,
        block.STONE.id)
mc.setBlocks(pos.x - 5, pos.y - 1, pos.z - 5,
        pos.x + 5, pos.y - 1, pos.z + 5,
        block.LAVA.id)

mc.setBlock(pos.x, pos.y - 1, pos.z, block.DIAMOND_BLOCK.id)

mc.postToChat("Get Ready")
mc.postToChat("Blocks under you will keep disappearing")
sleep(3)
mc.postToChat("Go")
gameover = False
while gameover == False:
    p = mc.player.getTilePos()
    mc.setBlock(p.x, p.y - 1, p.z, block.OBSIDIAN.id)
    sleep(2)
    mc.setBlock(p.x, p.y - 1, p.z, block.AIR.id)
    sleep(0.5)
    if p.y != pos.y:
        gameover = True
mc.postToChat("Game over.")
```