Introduction to Programming

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The Class

- Mix of lectures and hands-on labs
- Break halfway through class
- Raise hand to ask questions nay time
- Be respectful and inclusive
- Explore!

Background

Going around the room:

- What is your name?
- What school do you go to?
- What grade are you going in to?
- Have you done any programming? What languages?
- Have you used a Raspberry Pi?

Hardware

To get your computer up and running:

- Open each of the boxes
  - Keep the boxes for repacking later
- Connect monitor and mouse to Pi
- Connect power to the monitor
- Connect power to the Pi last
- Be gentle - altogether this equipment is about $250

Figure 1: HDMI

Figure 2: USB A

Figure 3: USB C

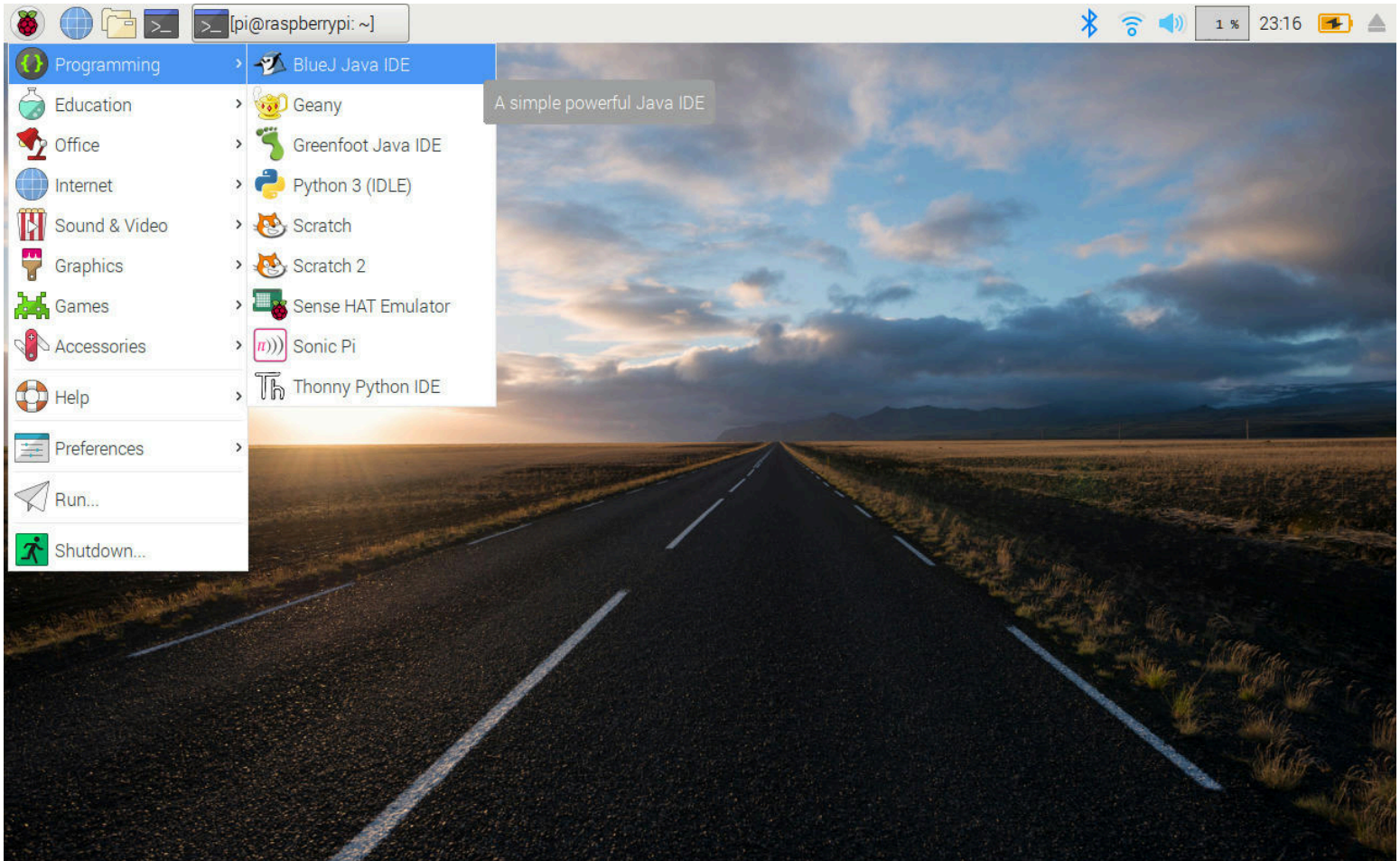
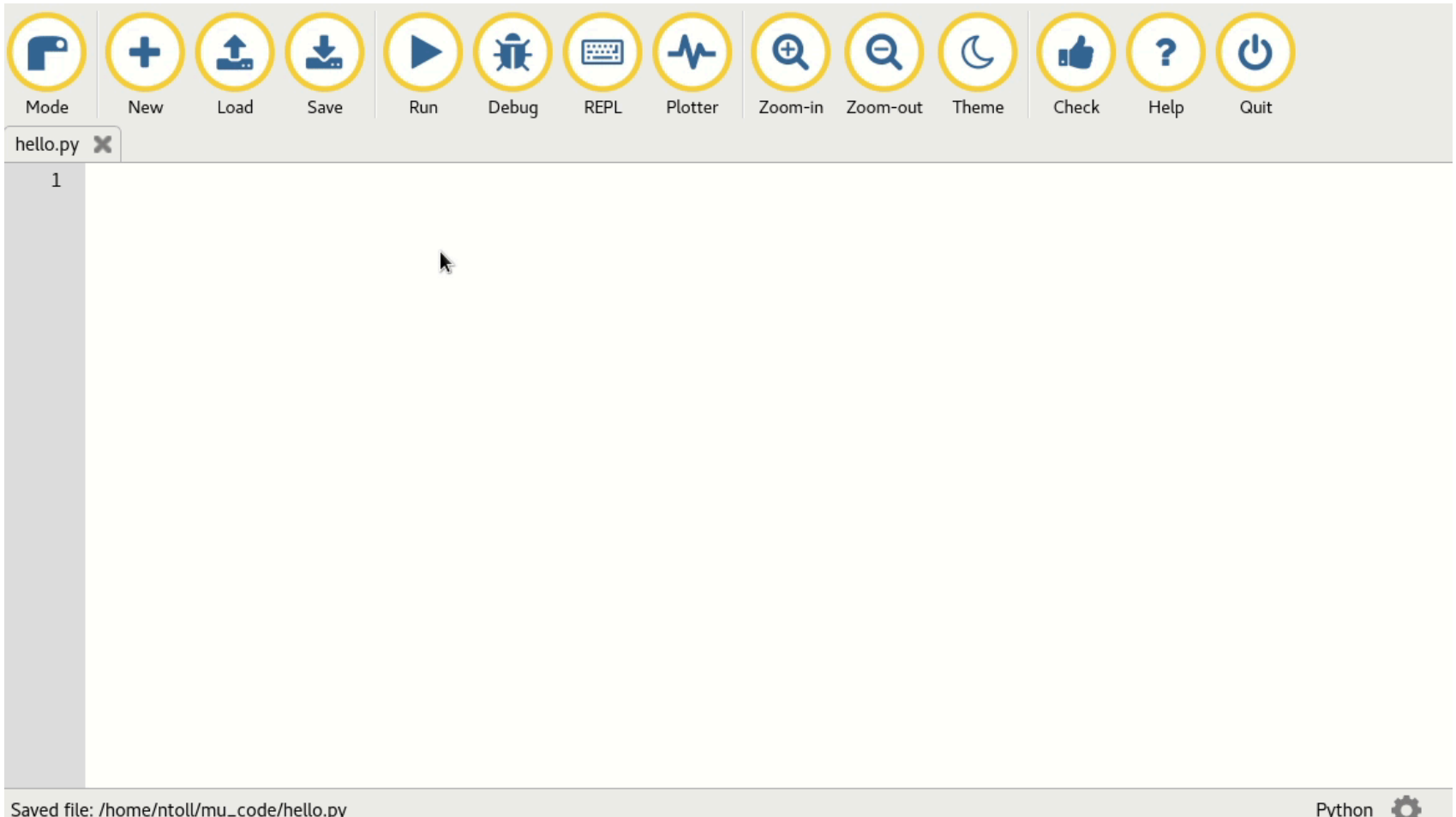


Figure 4: Graphical Desktop

Mu — Python Editor


Mode
New
Load
Save
Run
Debug
REPL
Plotter
Zoom-in
Zoom-out
Theme
Check
Help
Quit
hello.py
1
Saved file: /home/ntoll/mu_code/hello.py
Python

Your First Program

- Click the “New” button, then “Save” using `hello.py`
- Type this Python code into the text area:

```
print("Hello World!")
```

- Press Run
- Observe the output at the bottom of the screen
- Click “Stop” to return to editing your code

How Python Executes your Code

```
print("Dog")
print("Cat")
# Comments start with "#"
# print("Rabbit")
print("Bird")
```

Variables

Variables associate a **name** with a **value**.

The name goes on the left, then =, then the value.

```
name = "value"
score = 30
# The below throws an error
10 = score
```

Reading Variables

When a variable is used, its value at the time of execution is substituted for the variable name.

```
print("Dog")
animal = "Dog"
print(animal)
```

Reassigning Variables

```
animal = "Dog"
print(animal)
animal = "Cat"
print(animal)
```

`while` Loop

A **loop** instructs Python to execute a block of code over and over.

A **while loop** has this structure:

```
while statement_that_is_true_or_false:
    code_to_execute
    more_code_to_execute
```

`while` Loop

```
raining = True
while raining:
    print("Frog")
```

`while` Loop

```
number = 0
number_is_small = True
while number_is_small:
    print(number)
    number = number + 1
    number_is_small = number < 10
```

```
number = 0
while number < 10:
    print(number)
    number = number + 1
```

Break

Lab 1: Getting Started with the Sense HAT

- Connect the Sense HAT
- Go to here and try to complete the steps through "Displaying images"

https://projects.raspberrypi.org/en/projects/getting-started-with-the-sense-hat

- If you finish early, feel free to continue past those exercises or write your own programs.