

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 any 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 3: USB C



Figure 2: USB A

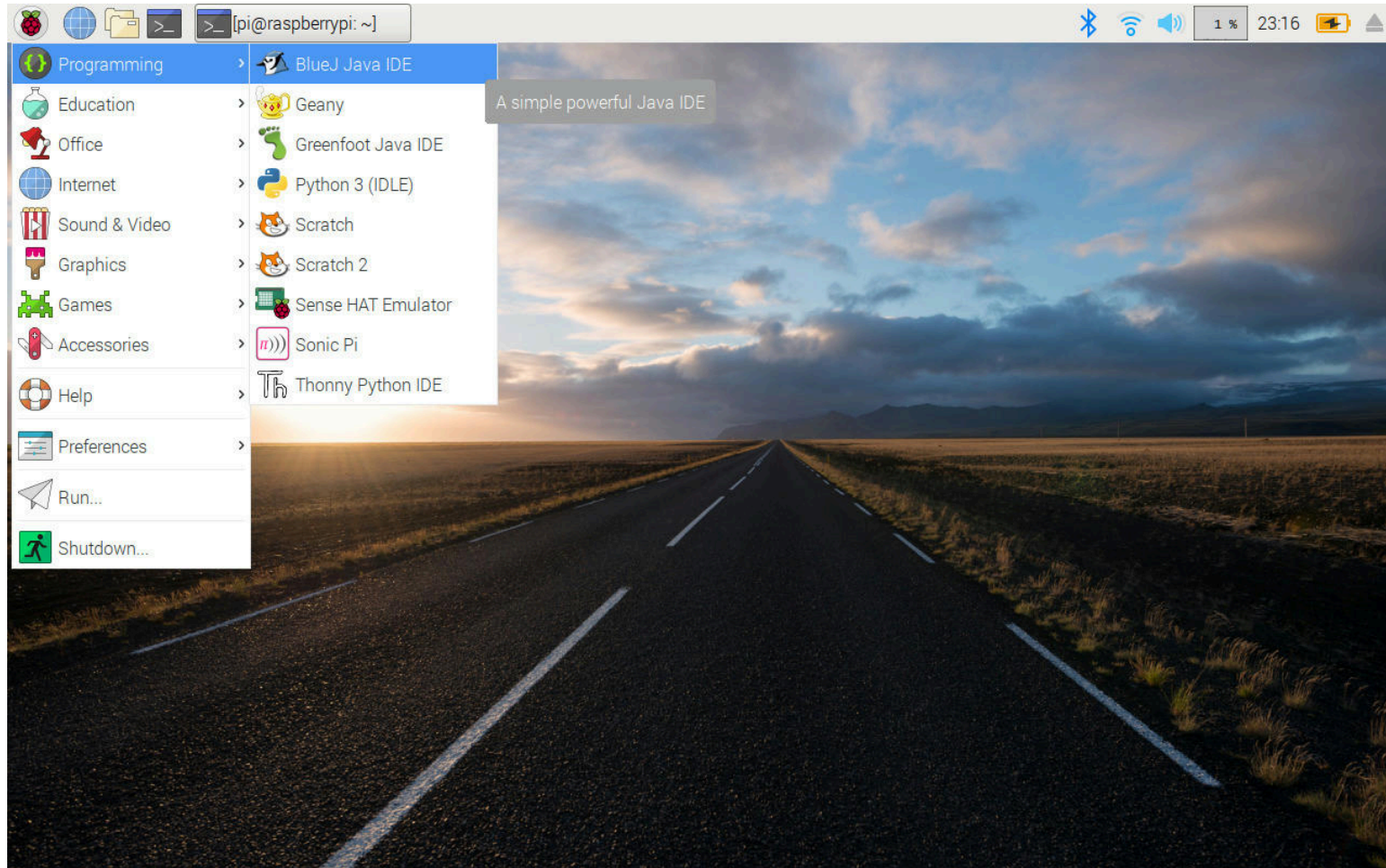
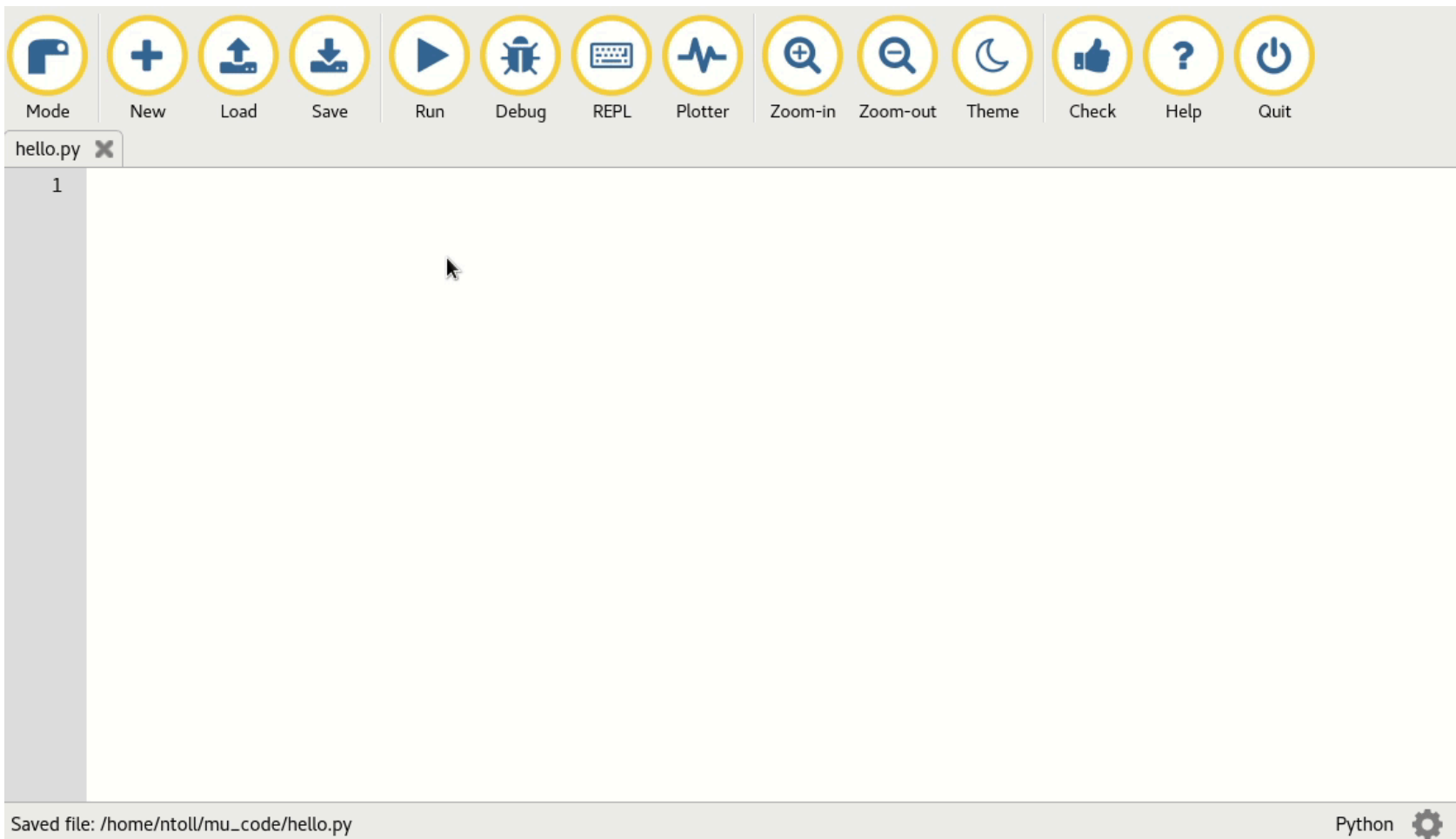


Figure 4: Graphical Desktop

Mu — Python Editor





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://tinyurl.com/wilson-pi-hat>
- If you finish early, feel free to continue past those exercises or write your own programs.