



COMP120: Creative Computing: Tinkering

2: Python Programming

Learning Outcomes

- ▶ **Apply** pair programming practices to solve a simple problem
- ▶ **Trace** some basic Python code

Professional Practice



Pair Programming

Pair programming is an agile software development technique in which two programmers work together at one workstation.

One, the driver, writes code while the other, the observer or navigator, reviews each line of code as it is typed in.

The two programmers switch roles frequently.

Pair Programming

Watch the video at:

<https://www.youtube.com/watch?v=ET3Q6zNK3Io>

(5 minutes)

Pair Programming

Review the guidelines at:

<http://www.pairprogramming.co.uk/>

(5 minutes)

Pair Programming

Watch the video at:

https://www.youtube.com/watch?v=ONnYCT_LJio

(5 minutes)

Code Tracing



Demo

- ▶ Start using debug tools when you run into problems:
- ▶ <https://www.youtube.com/watch?v=QJtWxm12Eo0>

Source Code: Less Red

```
def decreaseRed(picture, amount):  
    pixelMatrix = getPixels(picture)  
    for pixel in pixelMatrix:  
        value = getRed(pixel)  
        setRedPixel(pixel, value * amount)
```

Note: This source code excerpt will not work in PyGame.



Activity: Less Red

If 'bb' is the original picture of Big Ben, which of the below function calls created the change:

- ▶ `changeRed(bb, 1.5)`
- ▶ `changeRed(bb, 2.0)`
- ▶ `changeRed(bb, 0)`

PASS Challenge

Review the following PyGame setup code:

```
import sys, pygame
BLACK = 0, 0, 0
WHITE = 255, 255, 255
pygame.init()
screen = pygame.display.set_mode((640,480))
pygame.display.set_caption("Moving Box")
clock = pygame.time.Clock()

box_x = 300
box_dir = 3
```

PASS Challenge

Review the following PyGame loop code:

```
while 1:
    clock.tick(50)

    for event in pygame.event.get():
        if event.type == pygame.QUIT:
            sys.exit()

    screen.fill(BLACK)
    %TODO
    pygame.draw.rect(screen, WHITE, (box_x, 200, 20, 20) ←
    )
    pygame.display.flip()
```

PASS Challenge

- ▶ In pairs
- ▶ **Implement** the code excerpt
- ▶ **Fix** the errors in the code excerpt
- ▶ **Modify** the code excerpt to incorporate functions and arguments
- ▶ **Modify** the code excerpt to allow the player to move the box around the screen

You can learn more about PyGame input at:

<https://www.pygame.org/ftp/contrib/input.html>

(20 minutes)