Learning Coding

WITH PYTHON

Overview

- Empower every person to be able to code
- Material prepared on the go
- Light Material focused of demonstration and practices
- Aiming to be a live book
- Not just a Kotlin course. Concepts can be applied to any language
- Software Engineering basic concepts overviews
- Some tips about the area, interviewing and best practices
- Focused on fundamentals and essential concepts
- Skip some complex and not so common features
- Not easy, but I will simplify as much as possible
- Need to focus, review and practices
- Lots of practices, exercises and homework's
- Analogy with a gym :)

Course Details

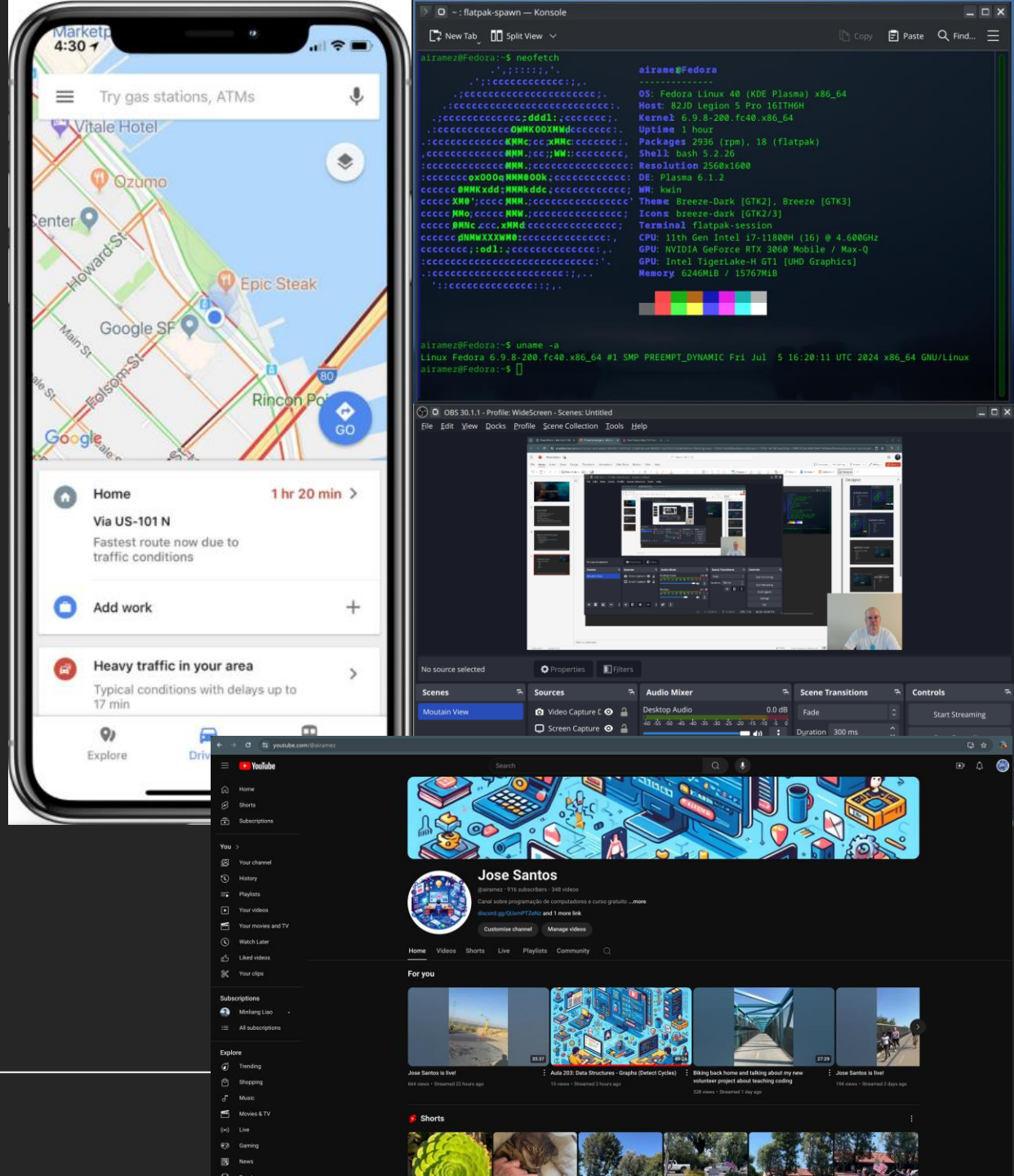
- URL: http://codelearn.live
- Repository: https://github.com/airamez/learn-coding-python
- Every Tuesdays and Thursdays at 8pm PST
- Kotlin as programming language
- VS Code as IDE
- Focus on fundamentals and practices
- Light material and heavy on demos and explanations
- Goal is to cover all content necessary to prepare a Junior Computer Programmer
- At least 600 hours to cover the basics: 300 hours of class + 300 hours of practices

Ongoing course in Portuguese

- I already have a coding course
  - Playlist: http://codando.live
  - Repository: https://github.com/airamez/IntroToCode_CSharp01
  - C# as programming language
  - VS Code as IDE
  - I speak in Portuguese

Application Layers

- User Interface (UI) or Front-End
  - *Console*
  - *Desktop*
  - *Mobile*
  - *Web*
  - *Server-Side*
  - *Data*



Data Processing Model

- Input (data)
- Processing
- Output (information)

Algorithm x Program

- Algorithm: An algorithm is a step-by-step procedure or a set of rules to solve a specific problem or accomplish a certain task in computing. It's like a recipe that describes the exact steps needed for a computer to solve a problem or reach a goal.
- Program: A program, also known as software, is a set of instructions written in a programming language that is used to control the behavior of a machine, often a computer. In essence, a program tells the computer what to do and how to do it.
- A program has to be translate before it can be executed
- Program source => Compiler => Executable code (machine language)

Finding the maximum number in a list

- Algorithm
  - *Set the maximum to the first number in the list.*
  - *For each number in the list:*
    - *If the current number is greater than the maximum, update the maximum with the current number.*
  - *The maximum is the largest number in the list.*
  - *List: 50, 30, 10, 55, 15, 80, 75, 35, 40, 90, 15, 10*
  - *Max:?*

Python

```python
def find_maximum(numbers):
    maximum = numbers[0]
    for num in numbers:
        if num > maximum:
            maximum = num
    return maximum

numbers = [50,30,10,55,15,80,75,35,40,90,15,10]
print(find_maximum(numbers))
```

Kotlin

```kotlin
fun findMaximum(numbers: List<Int>): Int {
    var maximum = numbers[0]
    for (num in numbers) {
        if (num > maximum) {
            maximum = num
        }
    }
    return maximum
}

fun main() {
    val numbers = listOf(50,30,10,55,15,80,75,35,40,90,15,10)
    println(findMaximum(numbers))  // Output: 9
}
```

C#

```
public class Program {
  static int FindMaximum(int[] numbers) {
    int maximum = numbers[0];
    foreach (int num in numbers) {
      if (num > maximum) {
        maximum = num;
      }
    }
    return maximum;
  }

  public static void Main() {
    int[] numbers ={50,30,10,55,15,80,75,35,40,90,15,10};
      Console.WriteLine(FindMaximum(numbers));
    }
}
```

Java

```
public class Program {
  static int findMaximum(int[] numbers) {
    int maximum = numbers[0];
    for (int num : numbers) {
      if (num > maximum) {
        maximum = num;
      }
    }
    return maximum;
  }

  public static void main(String[] args) {
    int[] numbers = {50,30,10,55,15,80,75,35,40,90,15,10};
    System.out.println(findMaximum(numbers));
  }
}
```

Assembly x86

```
section .data
    numbers db 50,30,10,55,15,80,75,35,40,90,15,10
    size equ $-numbers
    maximum db 0
section .text
    global _start
_start:
    ; Initialize maximum to the first number
    mov al, [numbers]
    mov [maximum], al
    ; Loop through each number in the array
    mov ecx, size
    mov esi, numbers
.loop:
    lodsb
    cmp al, [maximum]
    jle .continue
    mov [maximum], al
.continue:
    loop .loop
    ; Print the maximum number
    mov eax, 4
    mov ebx, 1
    mov ecx, maximum
    mov edx, 1
    int 0x80
    ; Exit the program
    mov eax, 1
    xor ebx, ebx
    int 0x80
```

Machine language

```
01010100 01101111 01110010 01101001 00101101
01100001 01101110 01100100 01101111 00101101
01110011 01101111 01101110 01100101 00101101
01101111 01101110 01100101 00101101 01101111
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```

```
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```