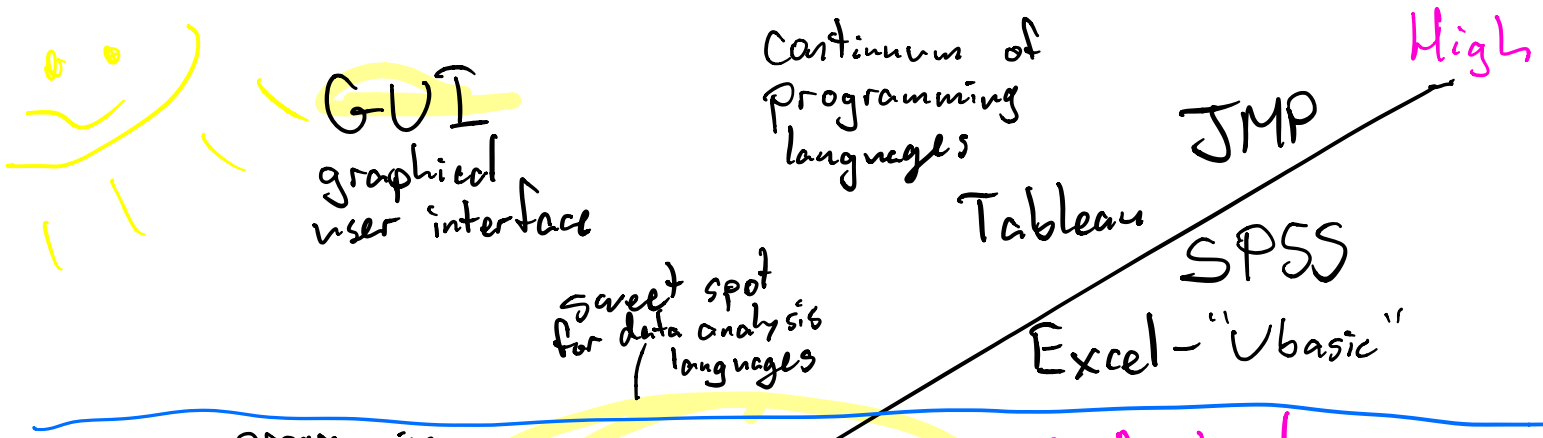warm call
pass OK

Outcomes:

► Situate R in the context of programming languages
► Describe use cases for R at a high level: interactivity, visualization, data analysis, and statistical modeling
► Describe difference between R and RStudio

Who has programmed before?

GUI
graphical
user interface

Continuum of
Programming
languages

High

JMP

Tableau

SPSS

sweet spot
for data analysis
languages

Excel - "Ubasic"

Ocean

programming languages

high level —— Python R

SQL — high level

"select name from students
where major = "math""

C++ Java

general purpose

C

nitty gritty details

I give more control

takes less code
to do a task

Low Assembly

R is a high level language.

Markup language: LaTeX
HTML

Principle: Everything to be as simple as possible
but no simpler.

What is a computer program?

Sarah: Give commands + computer performs tasks

Simplest: text files:

hw1.R — program

```
x = 1:10
mx = mean(x)
print(mx)
```

programming is editing text files

Why is programming intimidating?   - hard to break into
- learning a new language, not used to   - looks hard!
- programs must be perfect

Can edit any
language

Good w/ 1 language

Integrated development environments (IDE's) help you write code.

General
Purpose
Notepad++

Visual Studio
Sublime
Eclipse
Vim
emacs } work in terminal

Language Specific

Pycharm - Python
code blocks - C, C++
Spyder
intelij - Java

Features:
- error checking
- identify syntax errors
- generate code for you
- debugger
- autocomplete

$$R \neq R \text{studio}$$

a " company

Rstudio is the most common IDE for R.

the easiest, fastest way to start R

R is dead!

Python terrible for data analysis

:(

Language wars will waste your time.

R was made for statisticians, by statisticians.

Meaning R is good at:

- data analysis
- statistics   } Good in this domain
- math
- interactive ⇒ R may behave differently than PL you're used.
~ visualization

RStudio

Untitled1* ×

```
1  # sweet program
2  x = 1:10
3  plot(x)
4  mean(x)
```

file you're editing

.R — R script

.Rmd

Go to file/function   Addins

Run   Source

4:8   (Top Level)   R Script

Environment   History   Connections   Tutorial   Presentation

Import Dataset   List

Global Environment

Values

x   int [1:10] 1 2 3 4 5 6 7 8 9 10

Files   Plots   Packages   Help   Viewer

Zoom   Export   Publish

Console   Terminal ×   Jobs ×

~/

```
Type 'demo()' for some demos, 'help()' for on-line help, or
'help.start()' for an HTML browser interface to help.
Type 'q()' to quit R.

> ?plot
> head(iris)
  Sepal.Length Sepal.Width Petal.Length Petal.Width Species
1          5.1         3.5          1.4         0.2  setosa
2          4.9         3.0          1.4         0.2  setosa
3          4.7         3.2          1.3         0.2  setosa
4          4.6         3.1          1.5         0.2  setosa
5          5.0         3.6          1.4         0.2  setosa
6          5.4         3.9          1.7         0.4  setosa
> x = 1:10
> source('~/.active-rstudio-document')
>
```

type commands
R shows output

Index