Programming Concepts

Part 1: How to talk to your computer

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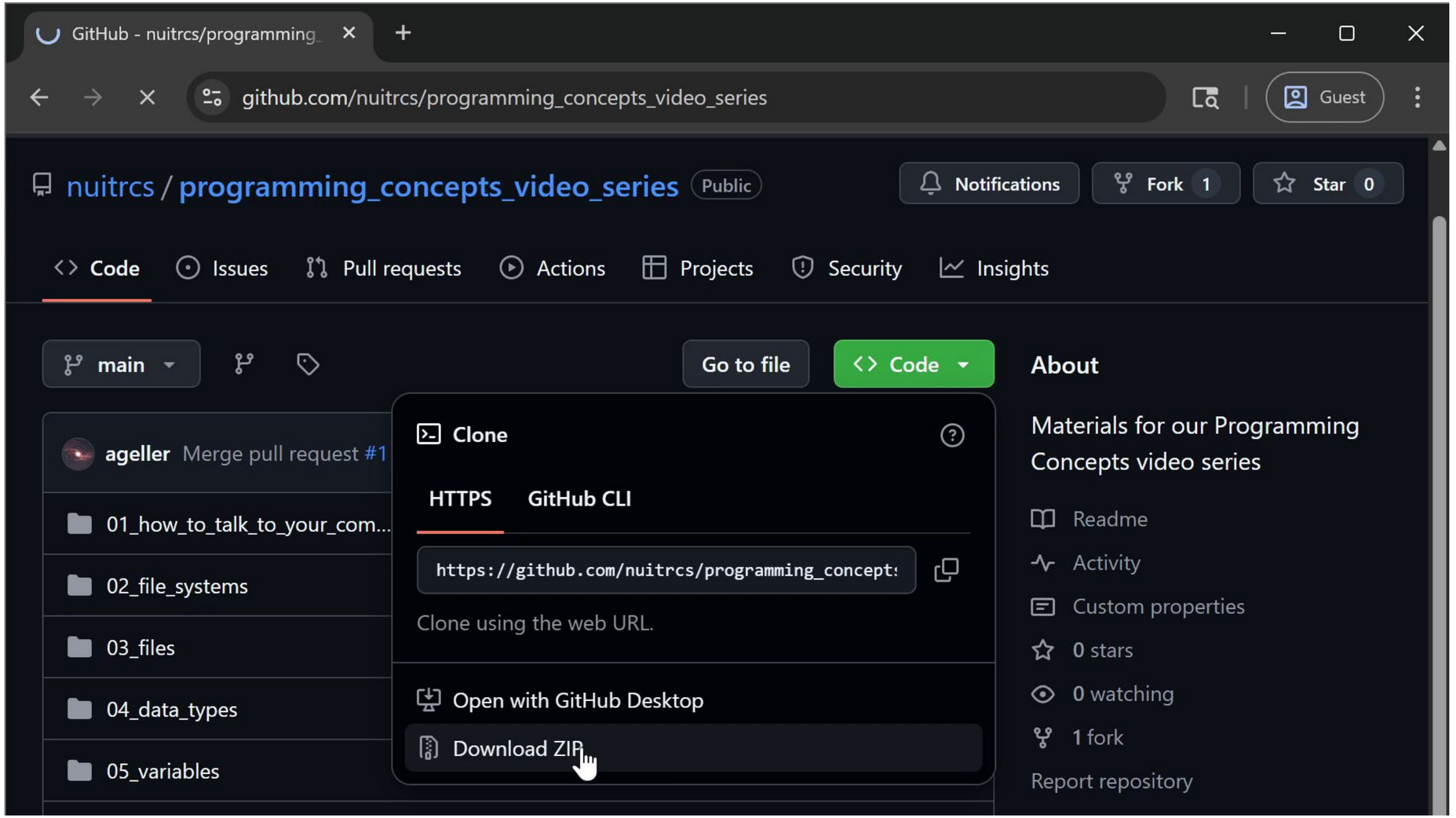
How to download these materials from GitHub

1. Navigate in your browser to : https://github.com/nuitrcs/programming_concepts_video_series
2. Click on the green Code button
3. Click on Download ZIP
4. Unpack the ZIP file on your computer to access the files.

(You should typically download all the files in a repo, as described above, instead of choosing to download only individual files.)

How to download these materials from GitHub

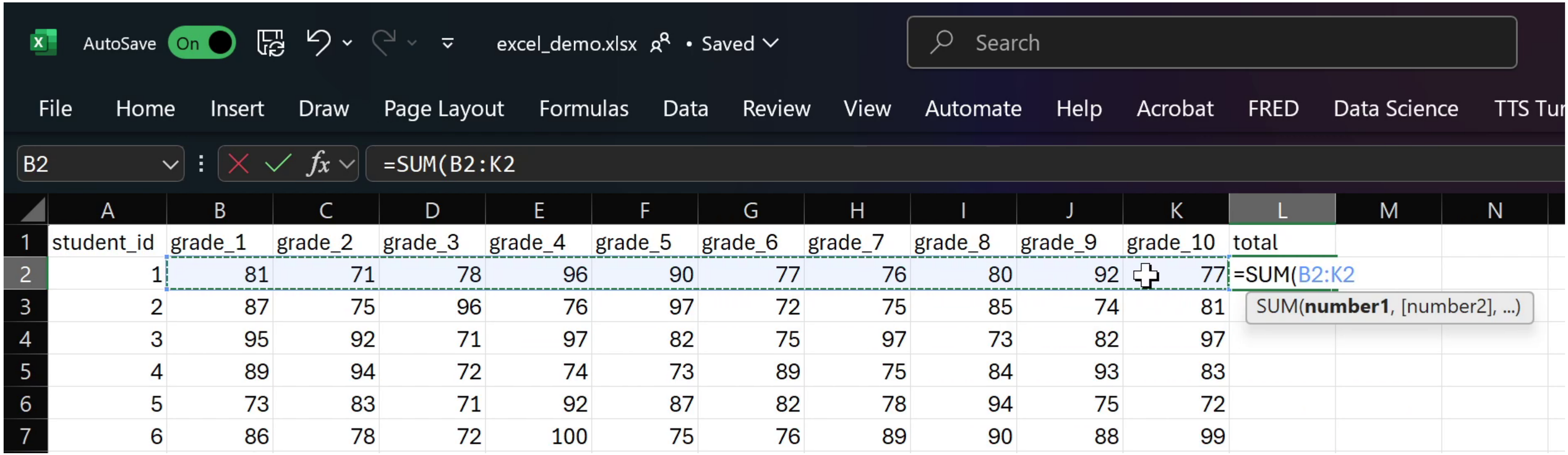


Programming languages

- You “talk” to your computer with programming languages.
- Modern computers can interpret many different languages.
- GUIs (graphical user interfaces) allow you to talk to your computer without knowing any programming language.

Programming languages

- Programming requires you to use specific words or characters in a specific order.



	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	student_id	grade_1	grade_2	grade_3	grade_4	grade_5	grade_6	grade_7	grade_8	grade_9	grade_10	total		
2	1	81	71	78	96	90	77	76	80	92	77	=SUM(B2:K2		
3	2	87	75	96	76	97	72	75	85	74	81			
4	3	95	92	71	97	82	75	97	73	82	97			
5	4	89	94	72	74	73	89	75	84	93	83			
6	5	73	83	71	92	87	82	78	94	75	72			
7	6	86	78	72	100	75	76	89	90	88	99			

Programming languages

- The ***command line*** is how we can talk directly to our computer without a GUI.
- Different computers have different ***shells*** to access the command line and different languages you use on the command line.
  - Mac: Terminal uses Unix Bash or zsh,
  - Linux: Bash shell
  - PC: Windows PowerShell, Git Bash, WSL
- These are designed for controlling your operating system and computer: installing programs, moving files, etc.

How do we talk to our computer in Python or R?

- ***Interactive programming :*** through a shell, one line at a time

```
user1@computer1: Documents $ python
Python 3.10.9 | packaged by conda-forge | (main, Fe
b  2 2023, 20:20:04) [GCC 11.3.0] on linux
Type "help", "copyright", "credits" or "license" fo
r more information.
>>> x = 4 + 5
>>> print(x)
9
>>>
```

How do we talk to our computer in Python or R?

- ***Interactive programming :*** through a shell, one line at a time
- ***Batch programming :*** running a whole script (a plain text file that contains one to many lines of code)
- ***Integrated Development Environments (IDEs):*** allows both interactive and batch programming
- ***Coding notebooks*** allow you to run code in chunks and view output directly below.

Time to review

- The next slide has a short "quiz".
- Navigate to the contents of our GitHub repo
  - If you already downloaded the repo to your computer, navigate to that directory.
  - Otherwise, you can view the quiz online here: https://github.com/nuitrcs/programming_concepts_video_series
- Open the folder "01_how_to_talk_to_your_computer", then open the file "01_how_to_talk_to_your_computer_slides.pdf".
- The quiz is on Slide 9 (and answers on are Slide 10).

Programming Concepts Part 1: How to talk to your computer

Quiz

(fill in the blanks)

1. A _____ allows you to talk to your computer without knowing a programming language.
2. When working interactively in the _____, each input line starts with a _____, which may look like >, >>>, or $ (or something else entirely) with a space after it.
3. You can also write a _____: a file with many lines of code in it to be executed together.

Programming Concepts Part 1: How to talk to your computer

Quiz answers

(fill in the blanks)

1. A ___GUI___ allows you to talk to your computer without knowing a programming language.
2. When working interactively in the __command line (or shell)__, each input line starts with a __command prompt__, which may look like >, >>>, or $ (or something else entirely) with a space after it.
3. You can also write a __script__: a file with many lines of code in it to be executed together.