PYTHON

MODULE 7

INTRO TO COMPUTER SCIENCE

WHAT IS COMPUTER SCIENCE?

- **Computer Science (CS):**
  - Involves electronics, programming, and an understanding of computational processes
  - Sound complicated? It can be! But it is also very easy to jump in and start learning.

com·put·er sci·ence

/kəmˈpyo͞odər ˈsīəns/

noun

the study of the principles and use of computers.

Definitions from Oxford Languages

Figure 1. Definition of CS

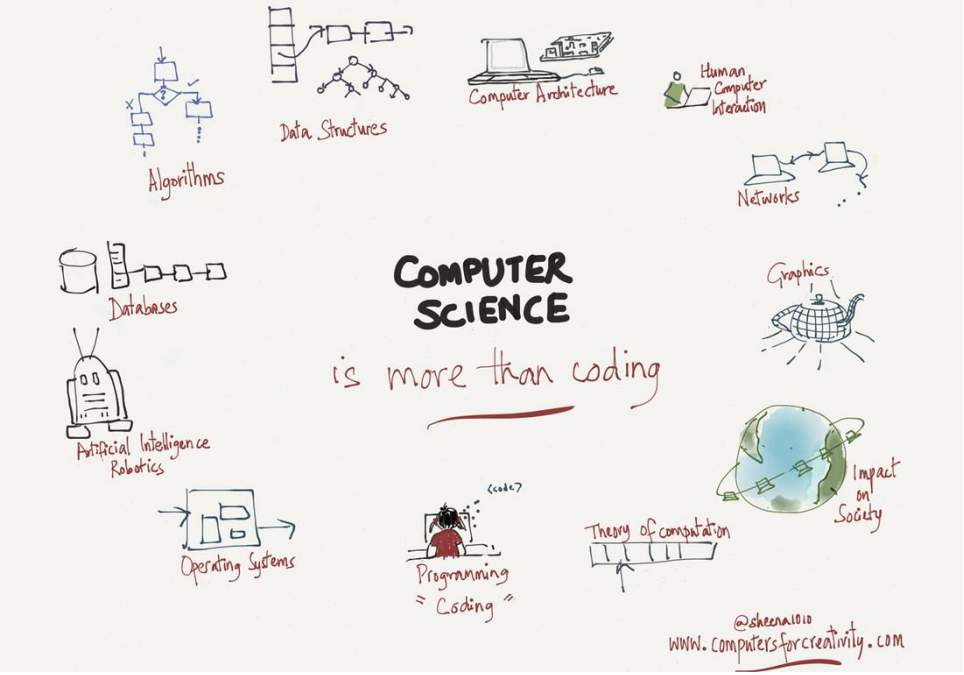
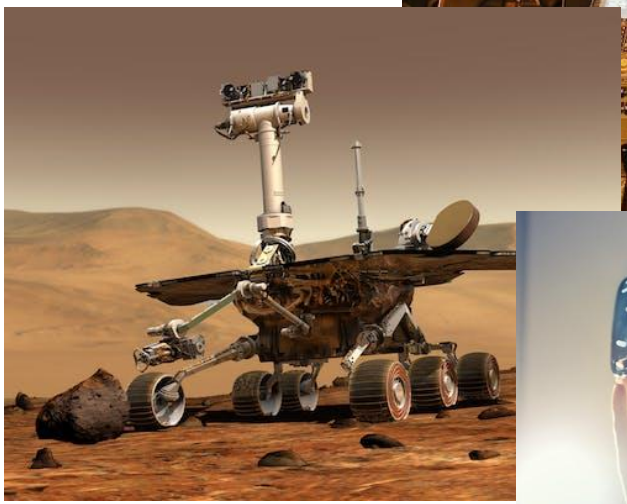


Figure 2. More than Coding

WHAT ARE THE APPLICATIONS?

- Robotics
- Artificial Intelligence
- Software Development
- Data Management
- Computer Graphics/Animation
- Computational Physics & Chemistry
- Website Creation
- Mathematical Calculations
- Controls (of airplanes, cars, and more)
- Operating Systems
- Systems Architecture
- Processor Design
- Image & Language Processing
- And so much more!



WHAT ARE THE APPLICATIONS?

Application	Meaning
Robotics	Control of automatically-operated machines
Artificial Intelligence	Computer performance of tasks that typically require human intelligence
Data Management	Collection, organization, and storage of data
Computer Graphics/Animation	Generation and alteration of image data
Computational Physics & Chemistry	Applied numerical analysis to solve physics and chemistry problems
Website Design	Creation and editing of websites
Mathematical Calculations	Use of computer processing to solve complex mathematical computations
Controls	Deliverance of commands to other systems (airplanes, cars, etc.)
Operating Systems	Design of software to run basic computer functions
Processor Design	Development of hardware to process basic computer functions
Systems Architecture	Modeling behavior paths of a system
Image & Language Processing	Computer analysis and interpretation of images and words
Software Design	Creation of software programs for any application
So Much More!	As you learn computer science, you will discover many more applications

Table 1. Applications of Computer Science

WHERE DO WE START?

- **How to Learn:**
  - A great way to learn an introduction to CS is through easy programming (like DroneBlocks!)
- **Think like a drone!**
  1. What task needs to be accomplished?
  2. What steps need to be taken?
  3. How can we turn the steps into code?
  - Remember: the drone moves differently than we do. Start thinking like a quadcopter instead of a human.

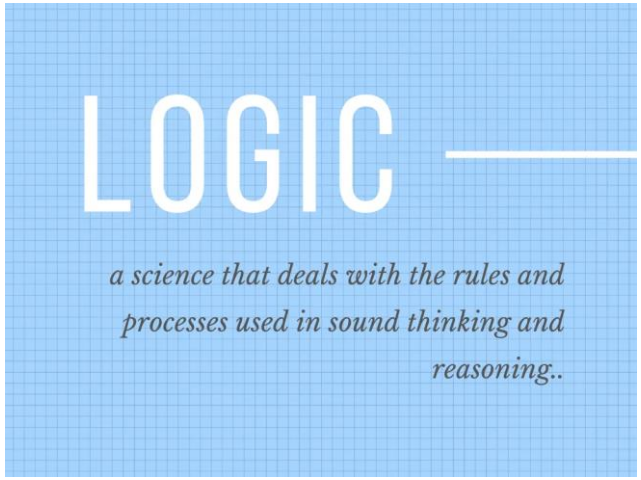


Figure 3. What is Logic?

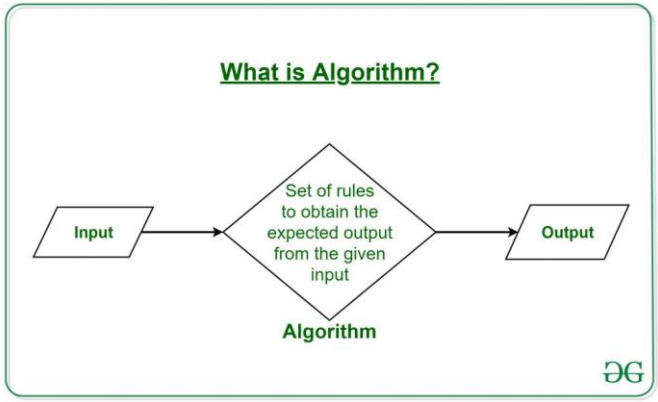


Figure 4. What is an Algorithm?

INTRO TO PYTHON

WHICH PROGRAMMING LANGUAGE?

- There are many types of programming languages. Just like human languages, they are all a little different and have to be learned individually (but if you learn one, it makes the next one easier!).
- **Python:**
  - This is the programming language that we will use to code our drones

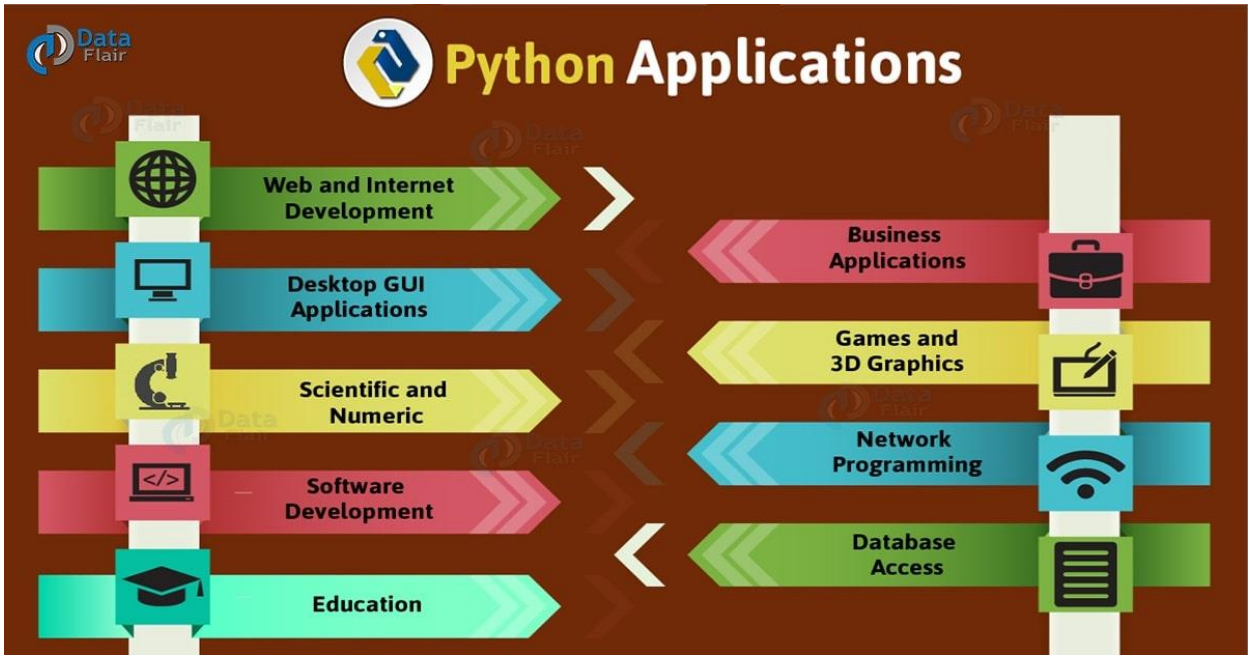


Figure 5. Python Applications

LET'S GET STARTED!

- **The best way to learn is to do**
  - See the following resources for practicing introductory coding.
- **Getting Started:**
  - HourofCode:
    - Easy Intro: https://groklearning.com/hoc-2016/activity/eliza/
    - Build a World: https://craft.buzzcoder.com/?lesson=hoc
    - Continue your World: https://craft.buzzcoder.com/?lesson=hoc2
  - Edabit:
    - Challenges: https://edabit.com/challenges/python3
    - Tutorials: https://edabit.com/tutorial/python
- See resources section for more website suggestions. There are hundreds of options, so pick which method works best for you!

RESOURCES

MORE RESOURCES

- **HourofCode:**
  - Easy Intro: https://groklearning.com/hoc-2016/activity/eliza/
  - Build a World: https://craft.buzzcoder.com/?lesson=hoc
  - Continue your World: https://craft.buzzcoder.com/?lesson=hoc2
- **Edabit:**
  - Challenges: https://edabit.com/challenges/python3
  - Tutorials: https://edabit.com/tutorial/python
- **freeCodeCamp Video:** https://www.youtube.com/watch?v=rfscVS0vtbw
- **learnpython.org Tutorials:** https://www.learnpython.org/en/Hello%2C_World%21
- **Google's Python Class** (for experienced programmers): https://developers.google.com/edu/python/
- **Udacity:** https://www.udacity.com/course/introduction-to-python--ud1110
- **Official Python Documentation:** https://docs.python.org/3/tutorial/index.html

SOURCES

SOURCES

- **Figure 1:** https://languages.oup.com/google-dictionary-en
- **Figure 2:** https://www.csinsf.org/what-is-cs.html
- **Figure 3:** https://aralipunan.com/logic-as-a-branch-of-philosophy/
- **Figure 4:** https://www.geeksforgeeks.org/introduction-to-algorithms/
- **Figure 5:** https://data-flair.training/blogs/r-vs-python-for-data-science/