

ScienceCraft



Computer Science

What is Computer Science?



- ✗ The study of **computers** and **computational systems**
 - ✗ Computational systems are anything that can be represented mathematically
- ✗ Computer science entails everything from basic **programming** to **software engineering** or **artificial intelligence**.
- ✗ Computer science is less about electronics and more about how to do things with a computer.

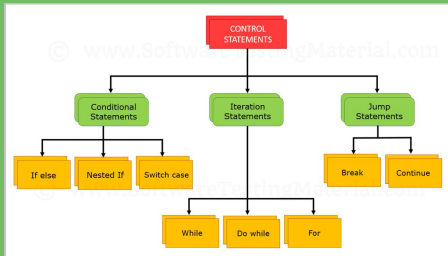


A close-up photograph of a person's hands typing on a laptop keyboard. The laptop screen displays HTML code, including table structures and image tags. To the right of the laptop, there is a white coffee cup on a saucer and a smartphone.

- ✗ Computer science degrees are more **popular** than ever before
- ✗ CS careers are for people who like problem solving, especially mathematically
- ✗ **Web Developer:** Responsible for assembling and testing websites and things that people see when they access a site
 - ✗ A **full stack** web developer means they also work on the back end.
- ✗ **Software Engineer:** Custom build and design software for a given task by **applying math**

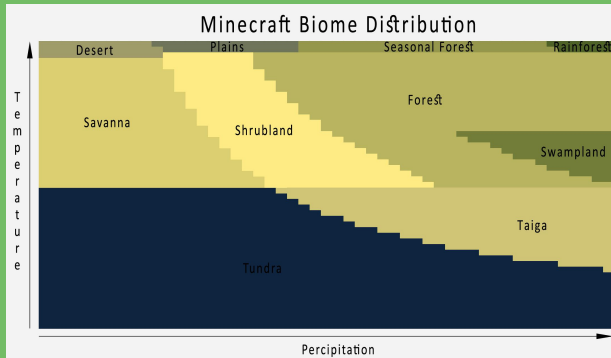
Programming

```
set total to zero  
get list of numbers  
  
loop through each number in the list  
  add each number to total  
end loop  
  
if number more than zero  
  print "it's positive" message  
else  
  print "it's zero or less" message  
end if
```



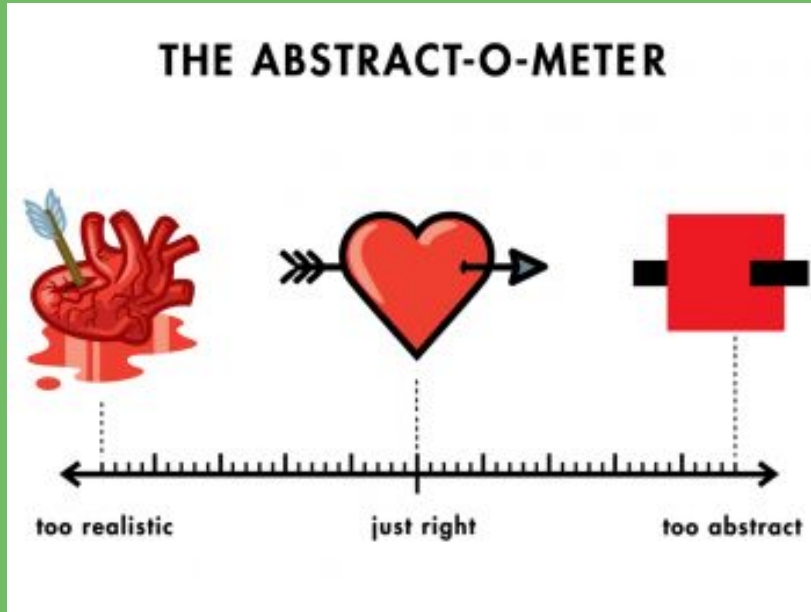
- ✗ The process of **building and designing** a program to accomplish a very specific task
 - ✗ For example, we use programs to restrict certain areas of the map to adventure mode.
- ✗ Consists of converting **pseudo code** into machine-readable code
 - ✗ Popular languages include javascript or python.
- ✗ Especially useful for doing work that loops on itself frequently or requires large levels of manual labor

Intro to Algorithms



- ✗ Algorithms are a series of instructions that computer programs follow in order to **solve a particular task**
- ✗ Can think of them as **mini instruction manuals**
- ✗ Computer algorithms work as an input/output system
 - ✗ For example, a **search engine algorithm** takes in a question as an input and searches a database
 - ✗ It outputs the **search results**

Abstraction



- ✗ One of the main goals of a computer scientist is **simplify technical information** from programming languages
 - ✗ Computer Scientists rely on abstraction in order to **make programming more efficient**
 - ✗ Also helps users when they are accessing certain programs
- ✗ One example of abstraction is in coding
 - ✗ **Repeating series of code** so it is portable

Can you think of any real-life examples of abstraction???

Artificial Intelligence



- ✗ Artificial intelligence is the process by which machines can **learn from experience**
 - ✗ Allows computers to adjust to new inputs and perform **human-like tasks**
- ✗ One example is when **computers use sensors** to detect information and adjust performance accordingly
- ✗ There are also **“progressive learning”** algorithms
 - ✗ Humans create inputs and program can teach itself how to respond
- ✗ **Can you think of any examples of Artificial Intelligence in real life??**

Challenge: Abstraction

- ✗ Build whatever you want at 2-3 different levels of **abstraction**
- ✗ Remember that higher abstraction means less details

