CPSC 256

1. Why programming?
2. Why C?
3. Why C++?
4. Next Steps

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1. Why programming?

→ Life is about solving problems: programming should be an enjoyable and creative way to learn how to solve problems.

→ Programming is a blend of art and science. It helps develop both sides of our brain, and helps enhance cross-neural pathways in the brain.

→ Good programmers have excellent organizational skills. Programming enhances one's ability to think logically and systematically through a solution.

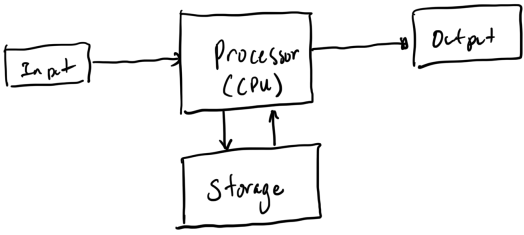
→ Solving a problem through programming almost always reveals new things that you did not anticipate before hand! One attains a deeper knowledge of the problem through programming.

↑ This last one, for me, is the most interesting! ☺

2. Why C?

How do computers actually do anything?
In fact, they are very simple beasts.

1. Storage.
2. Input
3. Output
4. Processing



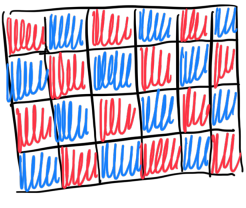
→ The CPU takes input, moves things around on registers (special memory locations) and produces output.

→ Programs → sets of instructions that tell how to create an output, from a given set of inputs.

Add two numbers.

```
getInput (a)
getInput (b)
c = a + b
putOutput (c)
```

Let's Make A Quilt



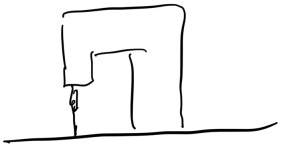
6 x 4 pattern
red + blue.
red in upper left

Python

```
import quilt_maker
quiltmake (6, 4, 'red', 'blue', 'red')
```

What I need

1. Start quilt making business.
2. Buy racks to store swatches of different colors.
3. Buy sewing machine.
4. Go to fabric store and buy swatches of different colors, in bulk, and store in new racks.



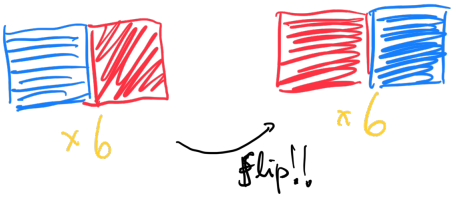
5. Receive order
   → (6 x 4, 'red', 'blue', 'red')

   a) calculate total squares
   $6 \times 4 = 24$

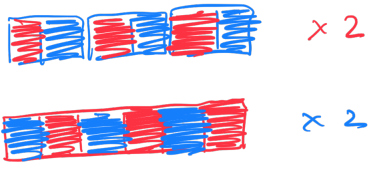
   b) divide by 2
   $\frac{24}{2} = 12$

   c) retrieve 12 reds + 12 blues from storage.

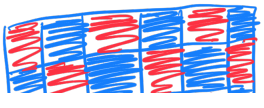
   d) divide by 2 again.
   $\frac{12}{2} = 6$



e) Assemble rows.



f) Assemble Quilt.



g) Ship to customer, have beer!

① Method to calculate # of "rectangles"
② Method to saw together a rectangle object.
③ Method to assemble rectangles into a quilt. (flip or not?)
④ Method to flip a rectangle

③ Why C++?

Python is, basically, a "wrapper" for C code

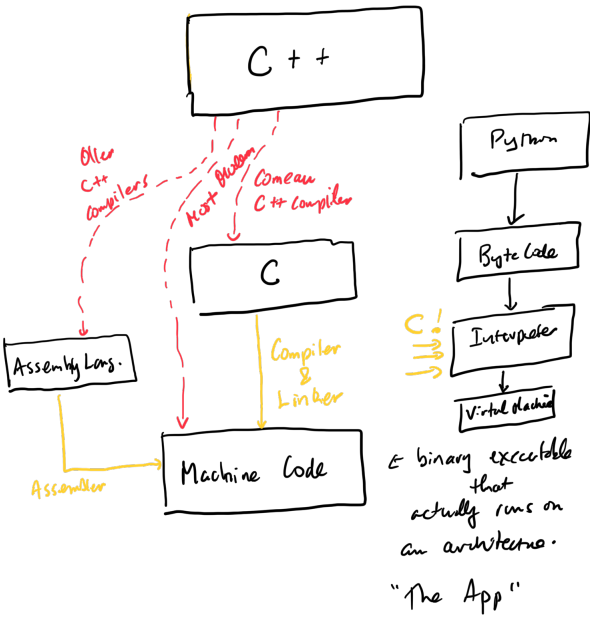
e.g. numpy
matplotlib
pandas
⋮

So is C++!!

The advantage is that C is forwards compatible with C++. All C code is C++ compatible. So, C libraries work fine in C++ ...

Why is it called C++?
- ++ ← extra features not in C
- C ← ANSI standard C
- object oriented approach

① Photoshop
② Spotify
③ Youtube
④ Amazon.com
⑤ Windows OS (and MacOS and Linux, too)
⑥ MS Office
⑦ Google (along with Java & Python)
⑧ MySQL
⋮



& binary executable that actually runs on an architecture.

"The App"