

Intro to CS + Python

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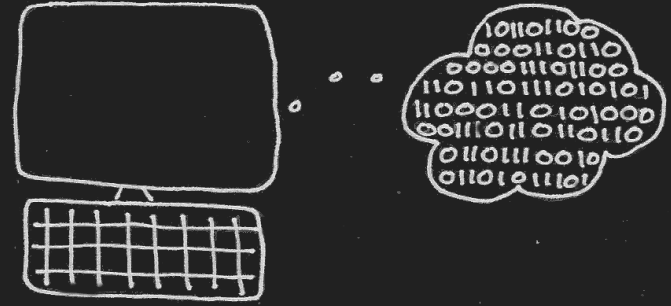
CS is EVERYWHERE!

What's your favorite use of CS?

What is Programming?

What is Programming?

- Telling a Computer what to do



INPUT

PROCESS

OUTPUT

- A set of instructions

What is Programming?



A “Good” Program

- It works
- You can read it
- Someone else can read it

Computer Languages

Languages

- Java
- C family (#, ++)
- Python
- Ruby
- FORTRAN
- Julia
- R
- Shakespeare?!?

Acts and scenes [\[edit\]](#)

A piece of code in Shakespeare is broken into `Acts` which contain `Scenes` in which characters (variables) interact. Each `Act` and `Scene` is numbered with a Roman numeral and serves as a `GOTO` label. Any code after the colon is considered a comment. They are written in the form:

```
Act I: Hamlet's insults and flattery.  
Scene I: The insulting of Romeo.
```

```
Juliet:  
  Am I better than you?  
  
Hamlet:  
  If so, let us proceed to scene III.
```


So Why Python?

- Conceived late 80s by Guido van Rossum
- Named after Monty Python
- Python 3.0 in 2008



Eric Idle ✓ @EricIdle · Jan 29

Thanks Guido. That's very flattering. I'm still a little unclear as to what it is but congratulations and well done.

...



Guido van Rossum ✓ @gvanrossum · Jan 29

Replying to @EricIdle and @KansasGrant

Hi @EricIdle, author of said "Python" software here. It's open source, which means it's free. It's been 31 years since I chose the name and I'm still a fan of your work! It's "very nice". Many folks working with me in the early days shared my appreciation.

33

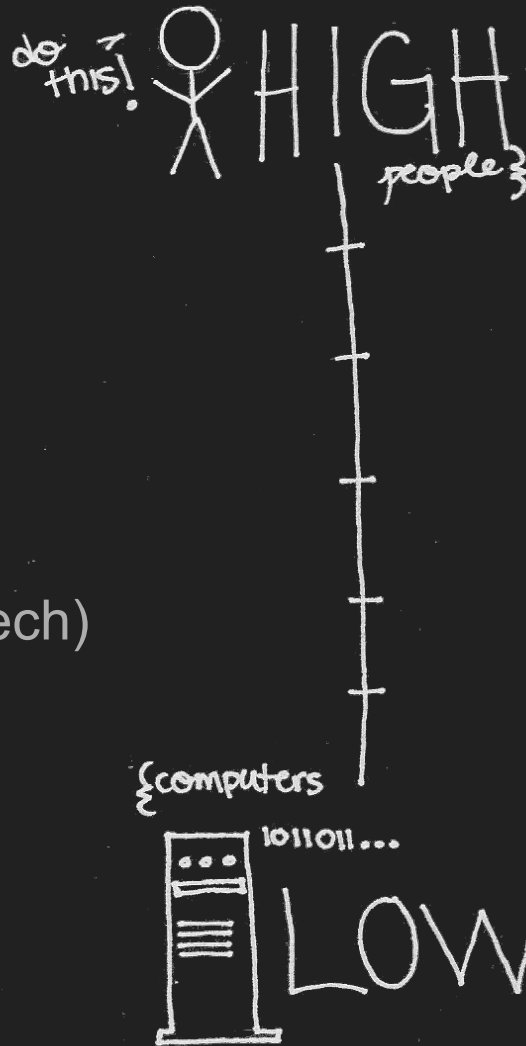
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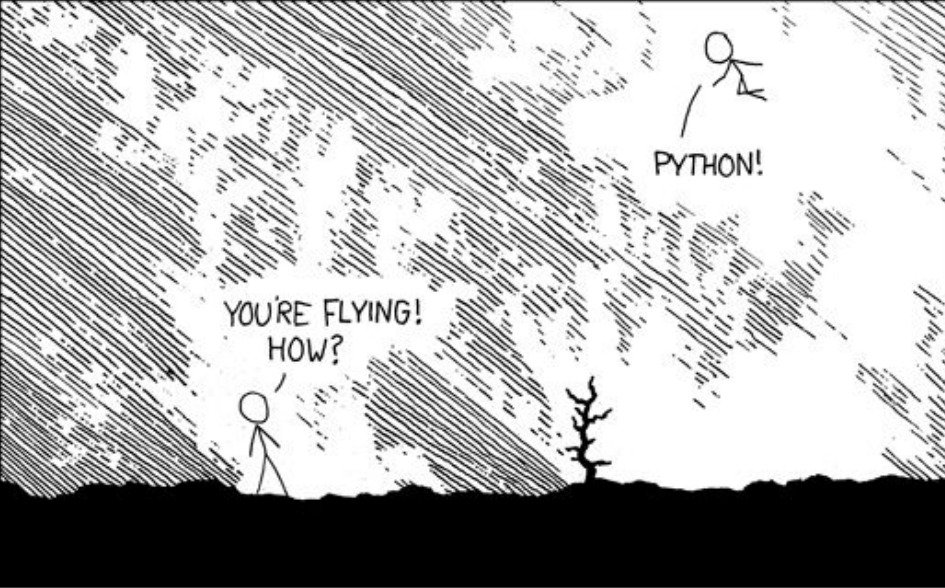
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So Why Python?

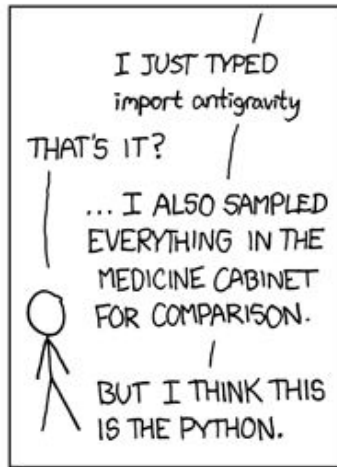
- Whitespace
- Dynamic Typing?!
- Interpreted
- Open Source
- FREE (as in beer, as in speech)
- High level





Try this using your IDE

```
import antigravity  
antigravity.fly()
```



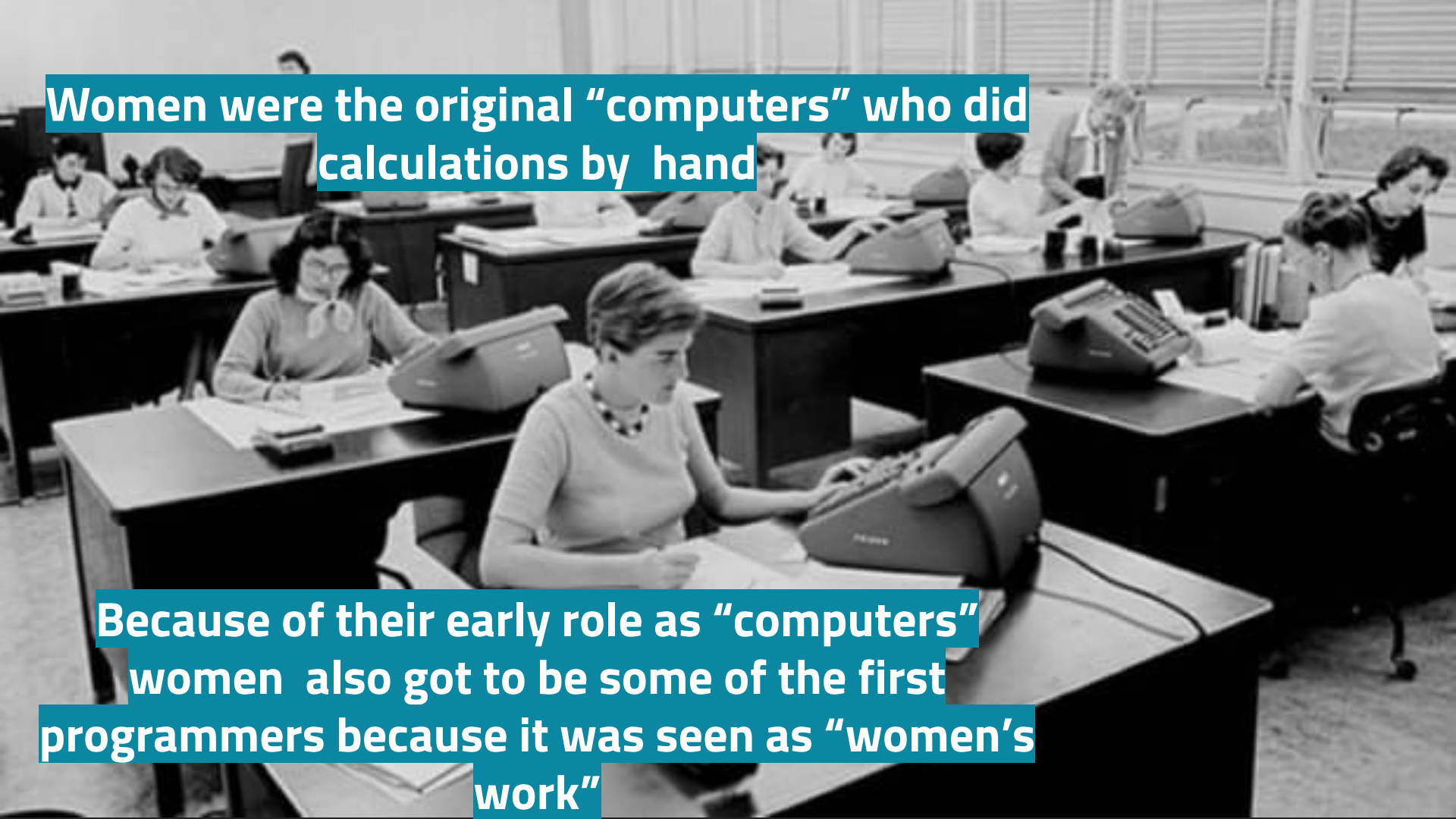
The Zen of Python

There should be one--and preferably only
one--obvious way to do it.

Human Computers

Women were the original “computers” who did calculations by hand

Because of their early role as “computers” women also got to be some of the first programmers because it was seen as “women’s work”



The INNOVATORS

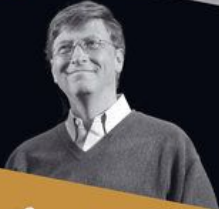
If this sort of thing interests you, I recommend this book, 100% not within the scope of this course



How a Group of Hackers,
Geniuses, and Geeks
Created the Digital
Revolution



the **INNOVATORS**



**Walter
Isaacson**

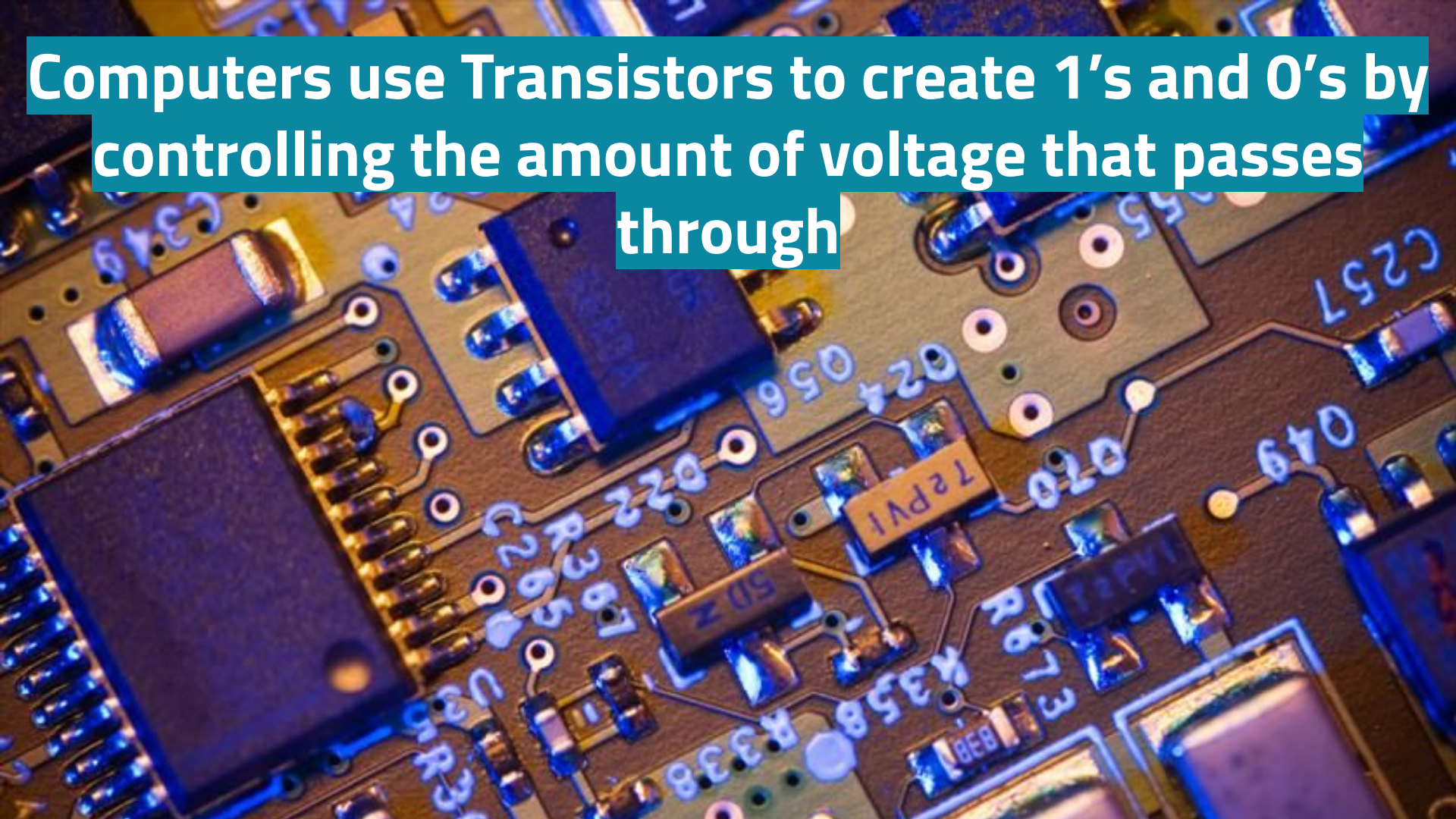
Author of
STEVE JOBS



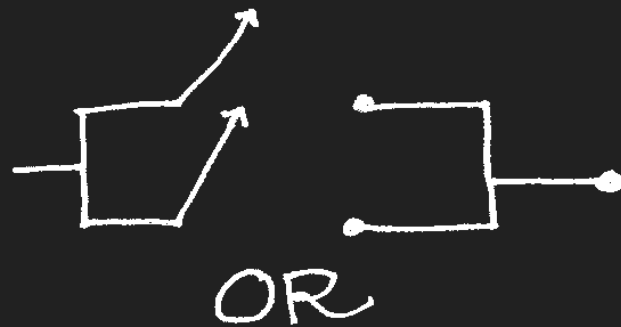
Non-Human Computers



Computers use Transistors to create 1's and 0's by controlling the amount of voltage that passes through



Logic Gates



FETCH -> DECODE -> EXECUTE -> STORE

Computer Components

Processor: Computers

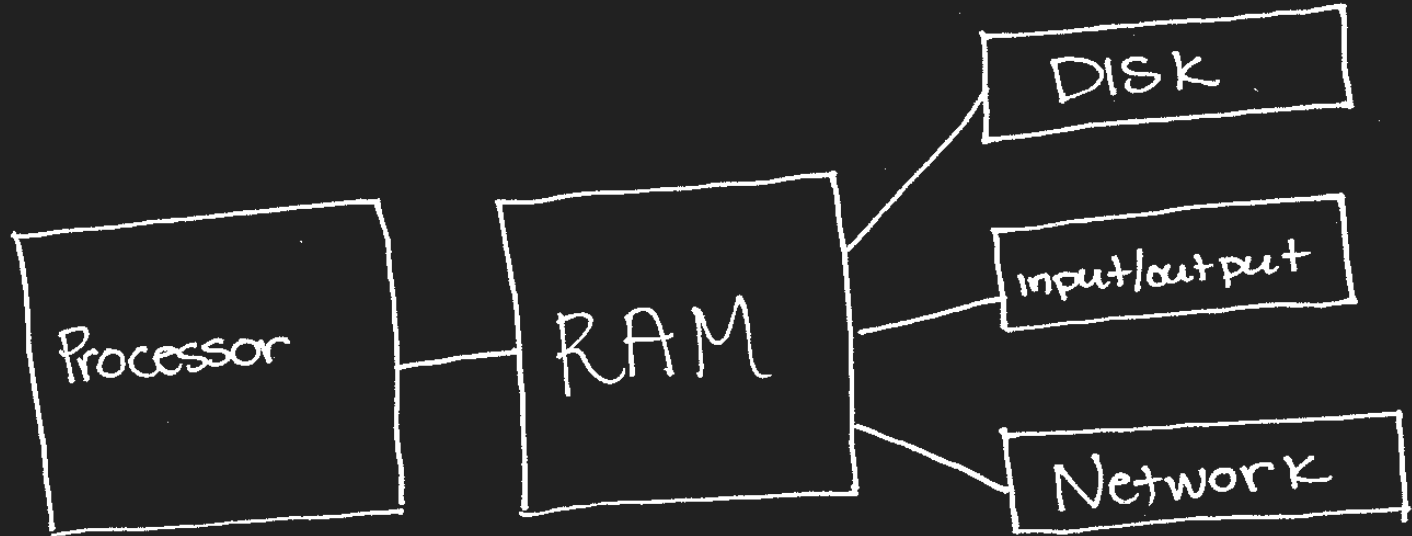
Main Memory: Retrievable memory
(RAM)

Disk: Permanent Memory

Input/Output: Screen, Keyboard,
Mouse, Touch

Network: Talking to other computers

Computer Components



Binary

Base 2 (Binary) Place Value Chart to Eight Places

128 One hundred twenty-eights place	64 Sixty-fours place	32 Thirty-tvos place	16 Sixteens place	8 Eights place	4 Fours place	2 Twos place	1 Ones place
1	1	0	0	0	1	1	1

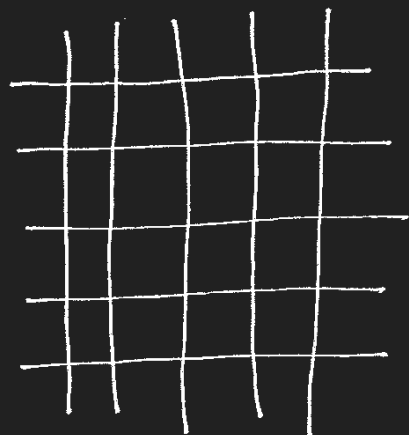


The most significant digit
aligns with the most
significant place value.

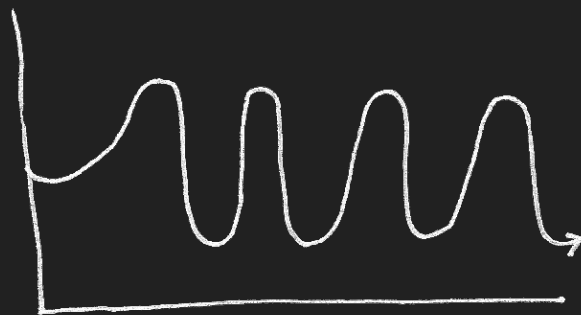


The least significant digit
aligns with the least significant
place value.

Binary



PICTURES



SOUND

Python Basics

Input/Output

Errors

ValueError:

`float("hello")` # often a conversion error

TypeError:

`"Abc" - 4`

NameError:



`x = y` #y is not defined

SyntaxError:

`x === 3`

IDEs

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A T O M

1.36.0
Release notes

Windows
For 64-bit Windows 7 or later

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