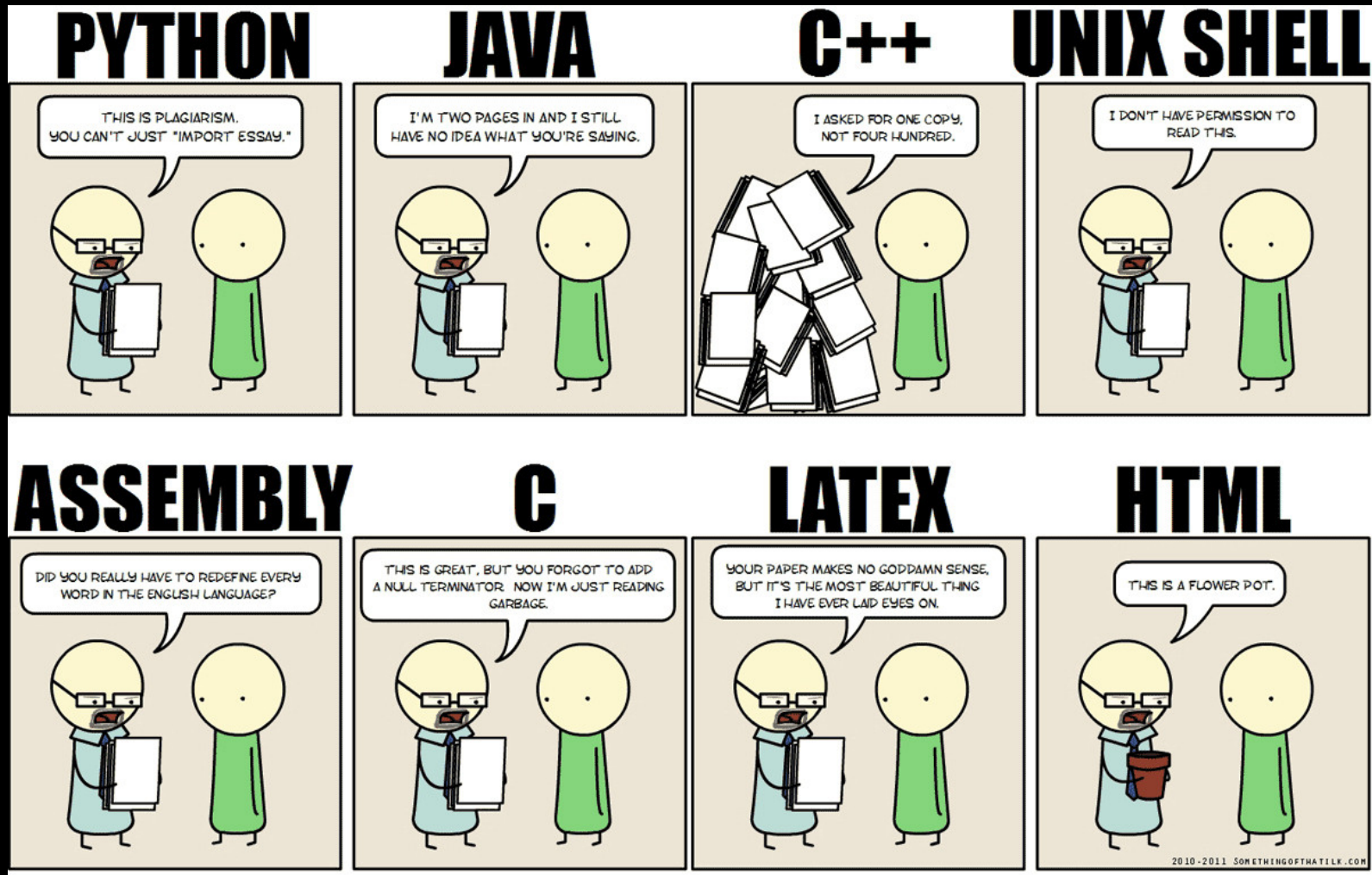


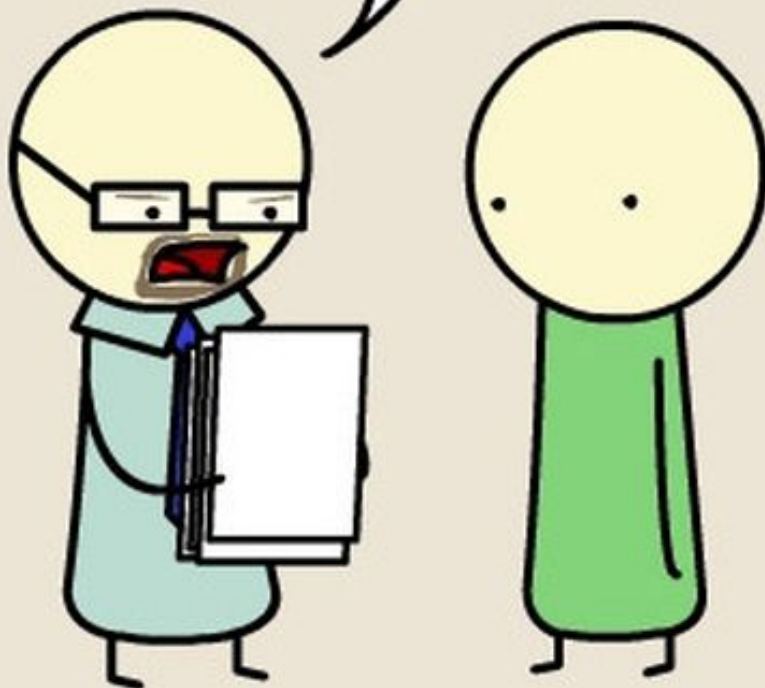
When You Write Your Essays in Programming Languages



<http://www.somethingofthatilk.com/index.php?id=135>

LATEX

YOUR PAPER MAKES NO GODDAMN SENSE,
BUT IT'S THE MOST BEAUTIFUL THING
I HAVE EVER LAID EYES ON.



CS 252:

Advanced Programming Language Principles

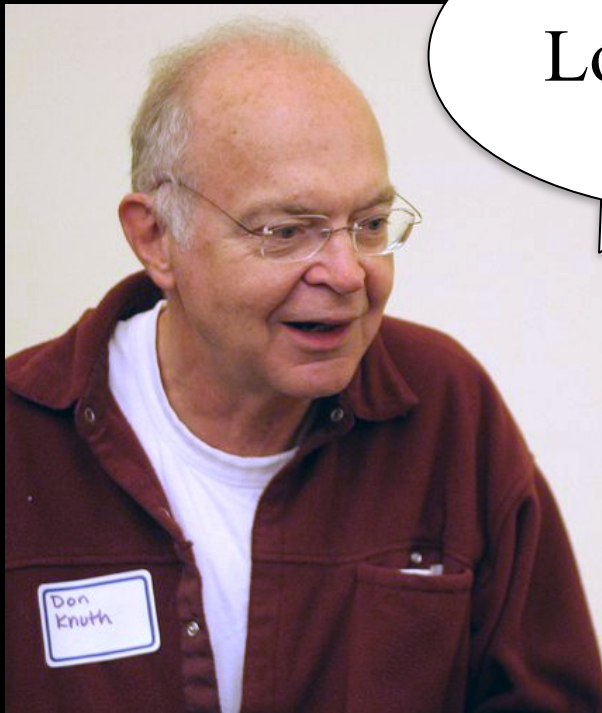


Prof. Tom Austin

San José State University

Homework 1 review

- Grade school addition
- BigNum addition
- Grade school multiplication
- BigNum multiplication



Donald Knuth

Looks nice!

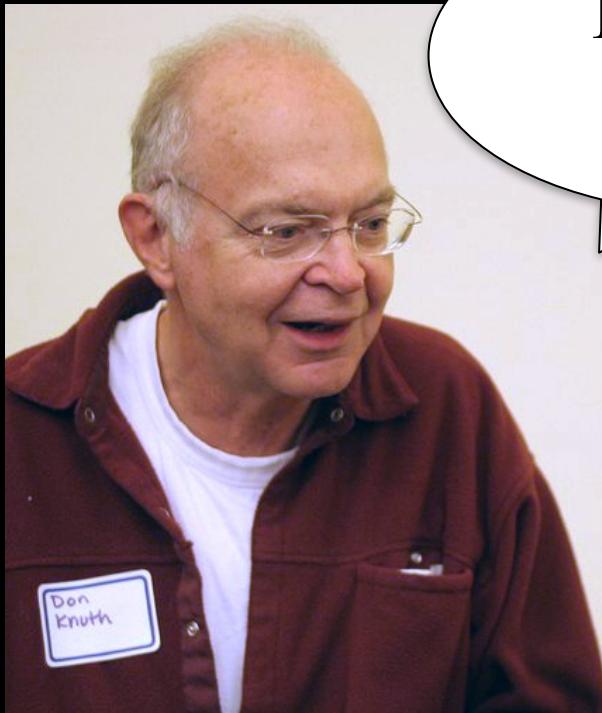
THE CLASSIC WORK
NEWLY UPDATED AND REVISED

The Art of Computer Programming

VOLUME 1

Fundamental Algorithms
Third Edition

DONALD E. KNUTH



Donald Knuth

Ick! Bad
fonts.

The Art of
Computer
Programming
1977 edition

In 1977, Knuth published a 2nd version.

Knuth did not like the fonts...

...but he did not think it was important.

HAH! That was a joke.

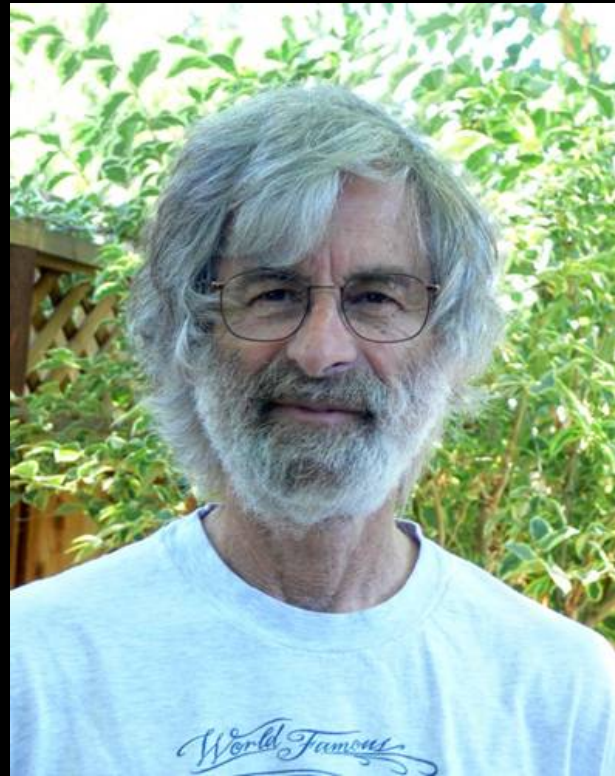
To solve his problem,
Knuth created a new
prog. language: **TeX**

The birth of TeX

- Precisely controls the interface of content.
- *literate programming*
 - logic is in natural language
 - code is interspersed

LaTeX

In 1985, Leslie
Lamport released
Lamport TeX



Leslie Lamport

Interesting aspects

- *Domain specific language (DSL)*
- Separation of concerns
 - Formatting kept separately from content (mostly)
- *Literate programming*

```
\documentclass{article}
```

```
\title{Hello World}
```

```
\begin{document}
```

```
\maketitle
```

```
\end{document}
```



**Specifies
document type**

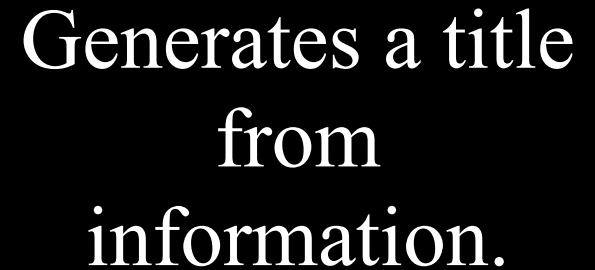
```
\documentclass{article}
```

```
\title{Hello World}
```

```
\begin{document}
```

```
\maketitle
```

```
\end{document}
```



**Generates a title
from
information.**

Sections & Labels

```
\section{Section One}
```

```
\label{sec:one}
```

```
\subsection{A subsection}
```

... (sometime later)

Back in Section~\ref{sec:one} ...

References are tedious to

- reformat
- renumber

BibTeX

- Reference details in `.bib` file
- In `.tex` file
 - `\cite` command adds references
 - Place bibliography with

```
\bibliographystyle{plainurl}
\bibliography{biblio}
```



`biblio.bib`
has references

BibTeX

- Reference details in `.bib` file
- In `.tex` file
 - `\cite` command adds references

`plainurl`
specifies
format

– Place bibliography with

```
\bibliographystyle{plainurl}  
\bibliography{biblio}
```

BibTeX Example

```
@article{literate,  
  author    = {Donald E. Knuth},  
  title     = {Literate Programming},  
  journal   = {Comput. J.},  
  year      = {1984},  
  volume    = {27},  
  number    = {2},  
  pages     = {97--111},  
}
```

Using `\newcommand`

- Use for repeated patterns in your code
- `\newcommand` defines the command
- Command can then be used in the rest of the text.
- `\renewcommand` redefines the command

\newcommand example

```
% Repeat input 3 times.  
% [1] means there is one argument.  
% #1 refers to the first argument  
\newcommand{\threetimes}[1]{#1#1#1}  
  
% Prints "hello there" 3 times  
\threetimes{hello there! }
```

Extended Example

(in class)

Some references

- LaTeX symbols table https://oeis.org/wiki/List_of_LaTeX_mathematical_symbols
- Overleaf – Collaborative LaTeX tool <https://www.overleaf.com?r=21c5fbc5&rm=d&rs>
- SJSU thesis LaTeX template <https://github.com/taustin/SJSU-thesis-LaTeX>

LaTeX lab

Write a short essay in LaTeX. The organization must be:

- **Abstract**
- **Section 1: Personal History**
(make up something interesting if your life has been boring)
- **Section 2: Academic/Career Goals**
(include at least one itemized/enumerated list)
- **Section 3: Research Topics of Interest**
(include 2 citations of papers, *USING BIBTEX*)

Include at least one label and one ref in your document.