What is the shortest path from Irvine to Bellflower?
How long would it take to visit all of the cities on this map?

Mark E. Phair, EECS 12, UC Irvine, 2006

EECS 12 – Lecture 0
Programs, programming, programming languages and python

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Agenda

- A problem (already seen)
- Some python
- Quick administrative interlude
- Programming as a profession
- Programming as a skill
- Programs
- Programming languages
- More python

Some Python

- Open IDLE now
- >>> is called the prompt
- 42
- 6*7
- 5 + 3 / 4
- 2.3 * 5
- print 'hello world'

Administrative Interlude

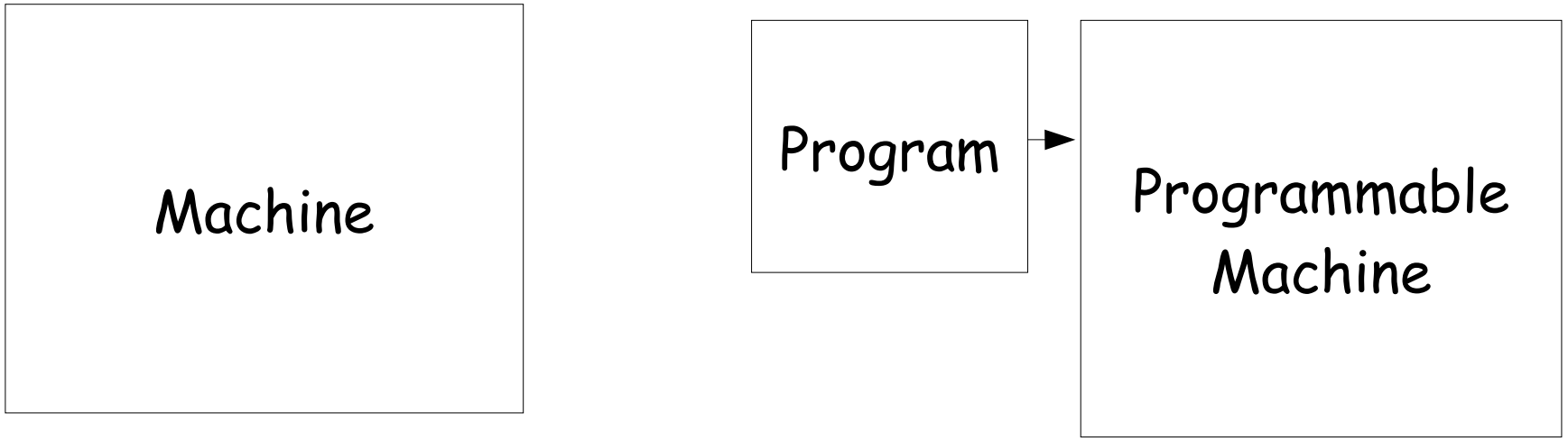
Programming as a Profession

- Programmer
- Software engineer
- Embedded systems engineer
- Web designer
- Others?

Programming as a Skill in Other Disciplines

- Math (numerical analysis)
- Hard sciences (computational biophysics)
- Social sciences (macroeconomic modeling)
- Business (data mining)
- Humanities (ACE program)
- Leisure (puzzle solving)

Why Programs?



Always does the same thing in the same way, over and over

Can do many different kinds of things, depending on program

What is a program?

A sequence of instructions that unambiguously tells a computer which actions to perform in which order.

Languages

- Languages are used for communication
- Human languages: "Natural Languages"
  - English
  - Sumerian
  - Mandarin
- Designed languages: "Formal Languages"
  - Mathematics
  - Legalese?

Programming Languages

- Used to communicate with computer
- There are lots of them, many considered "dead"
- Similarities with natural languages
  - Different words and structure for similar ideas
  - Some ideas more difficult to express in some languages than in others

Programming Languages

C

```
#include <stdio.h>


int main(int argc,
  char** argv)
{
   printf("Hello,
     World!\n");
   return 0;
}
```

Python

```
print 'Hello, World!'
```

For more, visit:
http://www2.latech.edu/~acm/HelloWorld.shtml

Types of Programming Languages

- Low level: Can be translated 1:1 to something the CPU can understand
  - Assembly language (for programmers)
  - Machine language (for the computer)
- "High" level
  - Traditionally: not machine language
  - Ranking: C is lower-level than Python is lower-level than LabView

Interpreted versus Compiled

- High-level languages need to be translated
- When does it happen?
  - Interpreted: User's time
  - Compiled: Programmer's time

More Python!

- help()
- dir()
- Let's explore!