CS 115 Lecture 2

Fundamentals of computer science, computers, and programming

Neil Moore

Department of Computer Science
University of Kentucky
Lexington, Kentucky 40506
`neil@cs.uky.edu`

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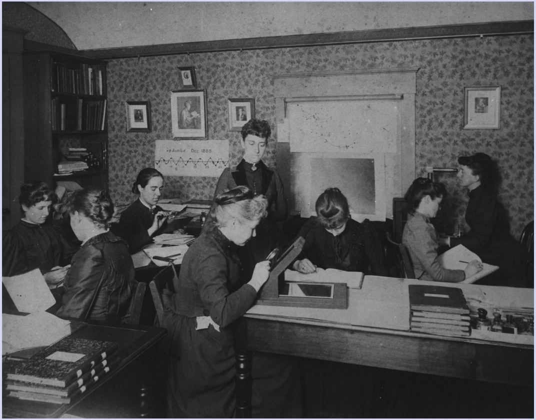

An early computer network, around 1890.

E.C. Pickering’s astronomy lab at Harvard.

Image: Harvard University, Wikipedia article “Harvard Computers”

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  - When you do long division or sort a list of names, you are computing.
- Computer science is the study of:
  - What can be computed using step-by-step procedures.
  - How best to specify these procedures.
  - How to tell if a procedure is correct, efficient, etc.
  - How to design procedures to solve real-world problems.

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Muhammad Al-Khwarizmi, Persian computer scientist.

Sculpture: S. Ch. Babajan / Image: Michael Zaretski, Flickr.

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    - Euclid's greatest common divisor algorithm.
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Sculpture: J. Durham / Image: Mark A. Wilson, Wikipedia, 2005.

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Dog house, refined

1. Decide on a location and size for the doghouse.
2. Get materials for the house.
    1. Get lumber.
    2. Get paint.
    3. Get nails.
3. Cut a piece of wood for the floor.
4. Repeat four times:
    1. Cut a piece of wood for a wall.
5. Cut a door into one wall.
6. Attach walls to the floor.
7. Make roof.
    1. Cut two pieces of wood.
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Image: user "Marsyas", Wikimedia Commons, 20 December 2005.

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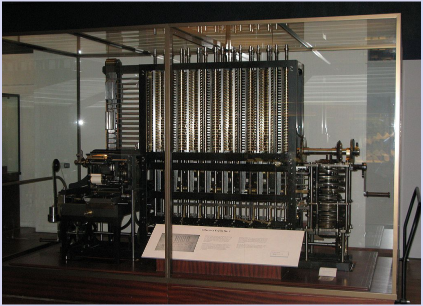

Babbage's difference engine, built 1991

Image: Allan J. Cronin, Wikipedia, March 2009.

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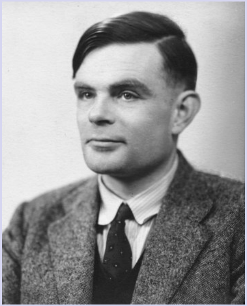

Alan Turing, British computer scientist.

Image: National Portrait Gallery, London, 1951.

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  - Programs become just another kind of data!
  - John von Neumann developed these ideas further in 1944.

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John von Neumann, Hungarian-American computer scientist.

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Image: Antoine Taveneaux, Wikipedia, 18 June 2012.

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- A **programming language** is a particular way of writing instructions to a computer.
- There are thousands of programming languages out there, dozens or hundreds of which are still in regular use.
  - A professional programmer usually knows several.
  - Then they can choose the right tool (language) for each job.
- In CS 115, we'll learn to write programs in **Python**, a high-level, interpreted programming language.

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Example program design

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# Purpose:   Ask for the user's name and greet them.
# Author:    J. Random Hacker, section 1,
#            random.hacker@uky.edu
# Assignment: Lab 42
# Main program:
# 1. Input the user's name from the keyboard
# 2. Output the word hello, followed by the user's name.
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Turned into code

We'll see more about how this code works next time.

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# 2. Output the word hello, followed by the user's name.
    print("Hello ", name)
main()
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