#### CS 150 Introduction to Computer Science 1

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#### What is CS150?

- CS150 is a programming course
- You will learn

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- $_{\circ}\,$  The mechanics of writing programs in C++
- $_{\circ}\,$  How to solve complex problems using C++
- How to break a large problem into smaller, more manageable problems
- How to formulate algorithms to solve problems
- You do not need any previous programming or computer skills to take this course

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# Who Are We?

Who am I?

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• Who are you?

#### How to Succeed in CS150

- Don't miss class. It is very difficult to pick up any material that you miss
- Try and read ahead even if you don't understand much
- · Start programming assignments early
- Do as much on your own as possible. The more help you get the less sure of yourself you will become

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### How to Succeed in CS150

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- Read the assignments carefully and follow all directions
- See me as soon as possible about any in class information that you are unclear on
- Take notes! A lot of the examples we will go through will be written on the board, and will not be in the notes

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### Course Schedule

- The course schedule I have given you is tentative. I expect to follow this schedule, but I may have to adjust it from time to time
- The online schedule will be accurate and up to date. That is the schedule that you should refer to when studying or revising

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# Introduction to Computers and Programming

Chapter 1

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#### Topics

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- What are computers?
- A little bit of history
- Computer basics
- Programming languages

#### What is a Computer?

- What is your definition?
- The most important thing to remember is that a computer is a machine that follows directions. In the case of programming, the machine is following *your* directions exactly

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• You need to be very specific about what you want the computer to do

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# Computer Systems

- Hardware
- Software

#### Hardware

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Physical components of a computer

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10

12

- Central Processing Unit (CPU)
- Main Memory (RAM)
- Secondary Storage
- Input Devices
- Output Devices
- · Let's look at each of these in detail

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# CPU

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A CPU

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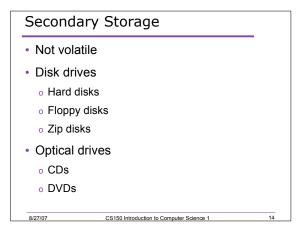
- Fetches instructions
- Follows instructions
- Produces results
- A CPU consists of
  - o Control unit: coordinates computer operations

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o ALU: performs arithmetic operations

Memory		
Address 0 1 2 3 4 5 6 7 8 9 10	Contents -27.2 354 0.05 -26 H 400 RTV 001 ADD 003 STO 005 X 1005	-Memory is a sequence of storage cells -Memory cells are 1 byte in size -Bytes are groups of bits (8 usually) -Bits are 0 or 1 -Each memory cell has unique address -Contents can be data or instruction -Everything stored as strings of 0s & 1s -RAM is volatile
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# Input/Output Devices

- Input: sends information to the computer from outside
- Output: sends information from the computer to outside

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15

• Examples?

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# Software

- Operating System
- Application Software

# Question

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- Can computers think?
- Computers need a list of instructions to perform operations

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16

17

18

• These instructions are programs

#### Program

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- Program
  - Set of instructions directing a computer to perform a task

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- Programming language
  - A language used to write programs
  - o Examples?

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### Programming Language

- Machine language
  - o Zeroes and ones
  - Machine dependent
- High level language
  - o Instructions look like everyday English
  - Each instruction can perform many machine language instructions

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19

20

21

#### C++

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- Based on the C programming language
- C++ is a high level programming language
- One of today's most popular programming languages

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• Used extensively in industry

#### Summary

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- Today we have looked at:
  - The history of computers
  - The hardware of computers
  - The software of computers
  - Concept of programming
- Next time we will:
  - Learn how to write our first C++ program
- Completed sections 1.1 1.3 from the book
  Pages1-12

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