Introduction

Course Content

Cross off the topics we will not be covering

How do computers work?	How are computers organized?
How do I fix computers?	Which computer should I buy?
What do computers consist of?	What are the differences between ARM, Core i7, etc?
How do I build a cheap computer?	

History Timeline

YEAR / TIME PERIOD	INVENTOR / DESIGNER	TECHNOLOGY	DESCRIPTION
Late 1500s	_____ Scottish mathematician		
Early 1600s	_____ German professor		
Mid 1600s	_____ French mathematician		
Late 1600s	_____ German mathematician, philosopher		
1801	_____ French weaver		Power loom with _____
1830s	_____ British mathematician		Machine with _____ & _____ that could be programmed
1830s	_____ British mathematician		

Year	Person		Description
1936	_____ British mathematician & cryptanalyst		Could compute any problem presented in a set of _____ A conceptual blueprint for automatic computation
1941	_____ German engineer		First fully-functioning _____ - controlled machine
1945	_____ American physicist _____ American electrical engineer		First _____ program-controlled computer Had no _____
1948			Prototype of stored _____ computer
1952	_____ American mathematician		Converted

(Source: Computer History Museum
https://www.youtube.com/watch?v=d1pvc9Zh7Tg&t=0s&list=PLzDdlaxoYgBsAEpBBLrzQR2IXcjBlEL1R&index=3&frags=pl%2Cwn, Cartoon Guide to Computer Science, Wikipedia)

Turing Machine

INPUTS	OUTPUT
_____ _____	_____
Example: Draw a block diagram of a Turing Machine 	

Computers are everywhere!

TYPE	APPLICATION
_____ purpose	servers, desktops, _____
_____ purpose / _____ systems	cash registers, _____ _____

Levels of Abstraction

DESIGNER			LEVEL	HIERARCHY
CS	CE	EE		

Natural Language

The problem we want to solve.

e.g. _____

Algorithm

_____ guaranteed to terminate, such that each step is precisely stated and can be carried out by the computer.

e.g. _____

Program Level

OS   _____ _____:

Computer management program / interface between application programs and machine architecture

```
def binary_search(array, target):
     mid_index = len(array)/2
     median = array[mid_index]
     # base case
     if array[mix_index] == target:
          return
     elif target < median:
          binary_search(array[0:mid_index], target)
     else:
          binary_search(array[mid_index:], target)
```

Machine / Macro Architecture

Also known as the ISA:

_____ _____ _____

ISA defines:

1) Native _____

 that can be executed by the system

2) Formats for _____ & _____
(interpretation of 1's and 0's)

In this class, we are using the _____ instruction set.

Micro Architecture

_____ implementation of the ISA

Different machines with the same macroarchitecture may have different micro architecture.

Logic Circuits

_____ of the micro architecture that make decisions

```
Draw a few logic gates




```

Devices / Transistors

_____ of logic gates

```
Draw a MOSFET transistor




```