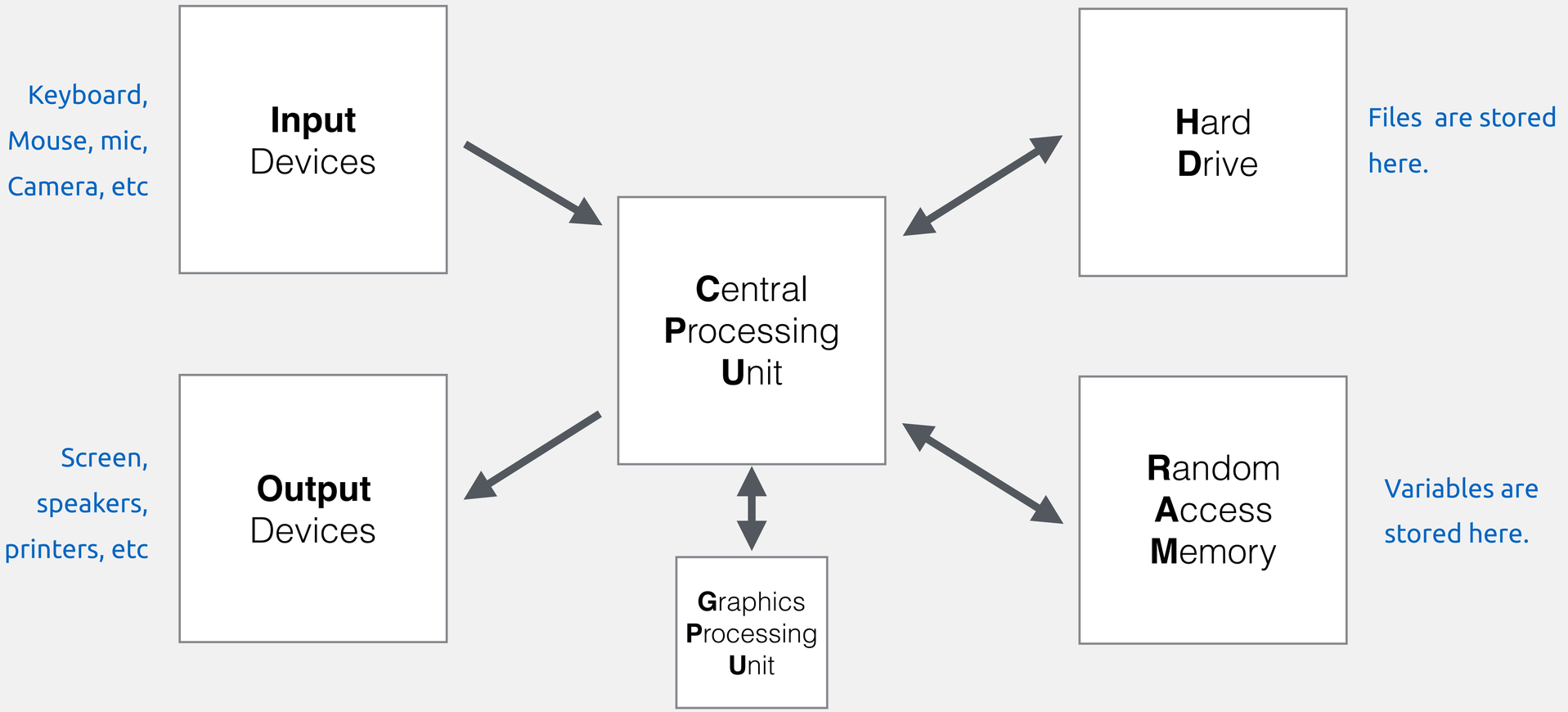
WEEK THREE - DECISION

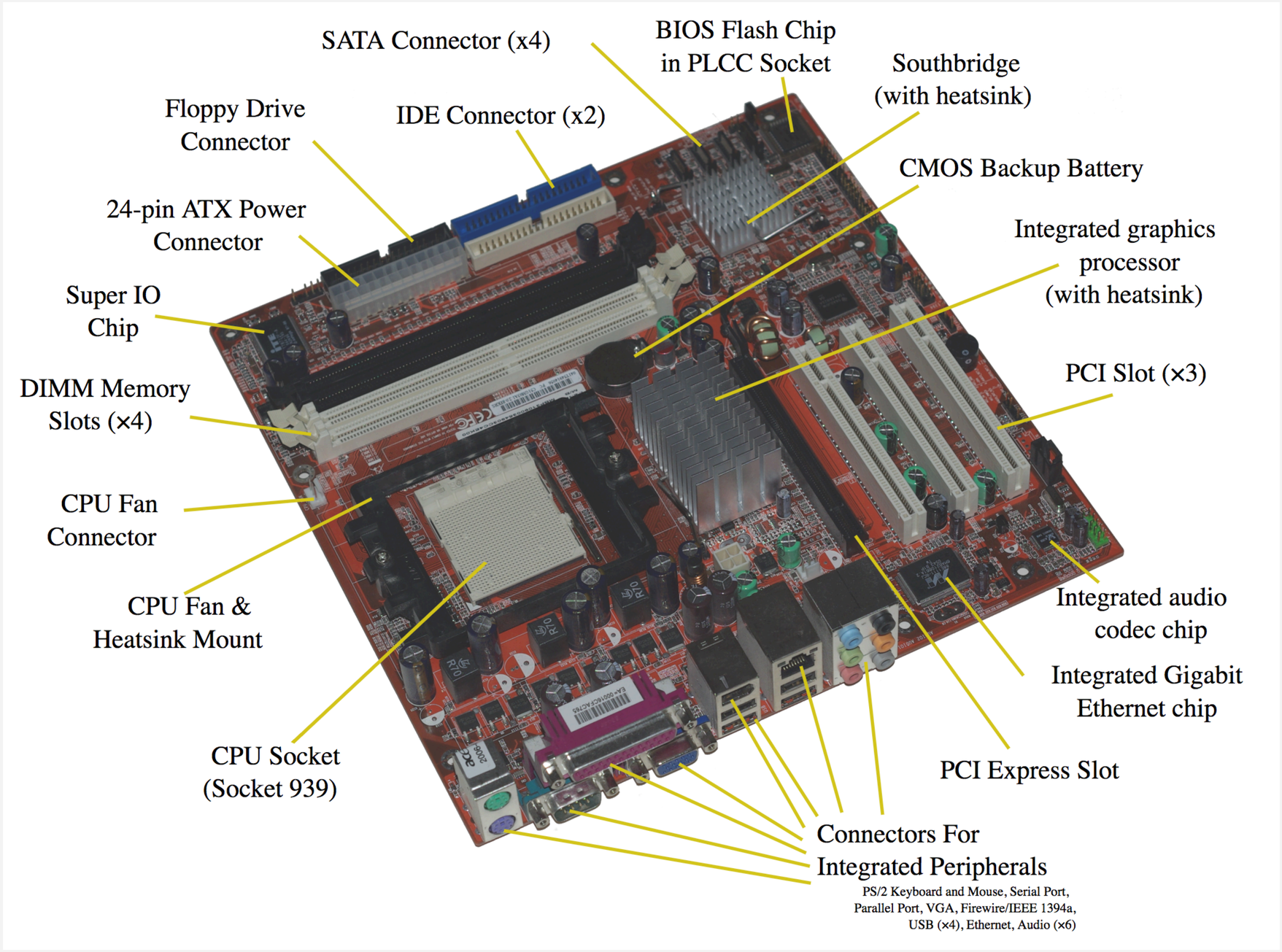
Conditionals / Console / User input

Lior Ben-Gai
November 2019

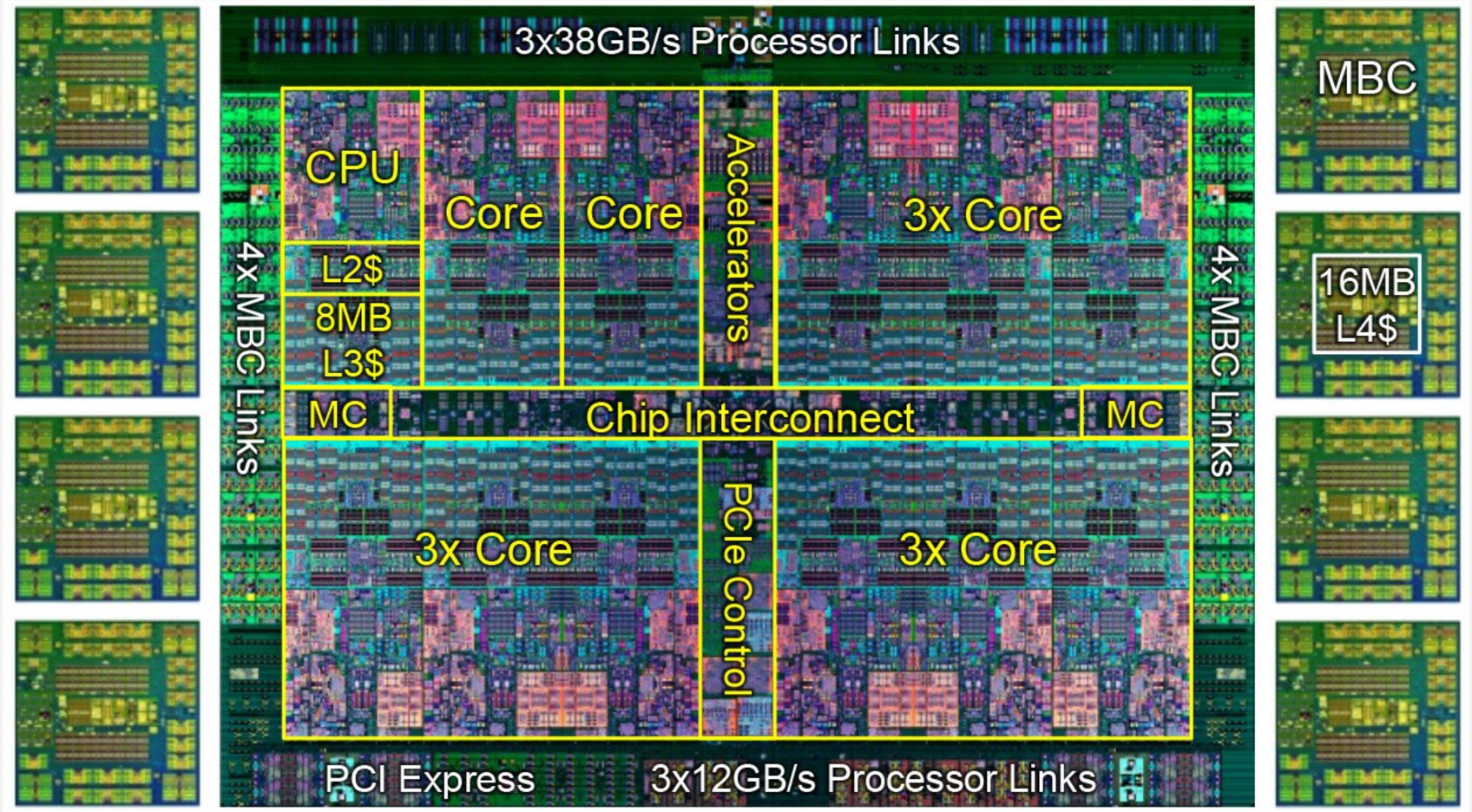
HIGH LEVEL VIEW OF A COMPUTER

(very high level)

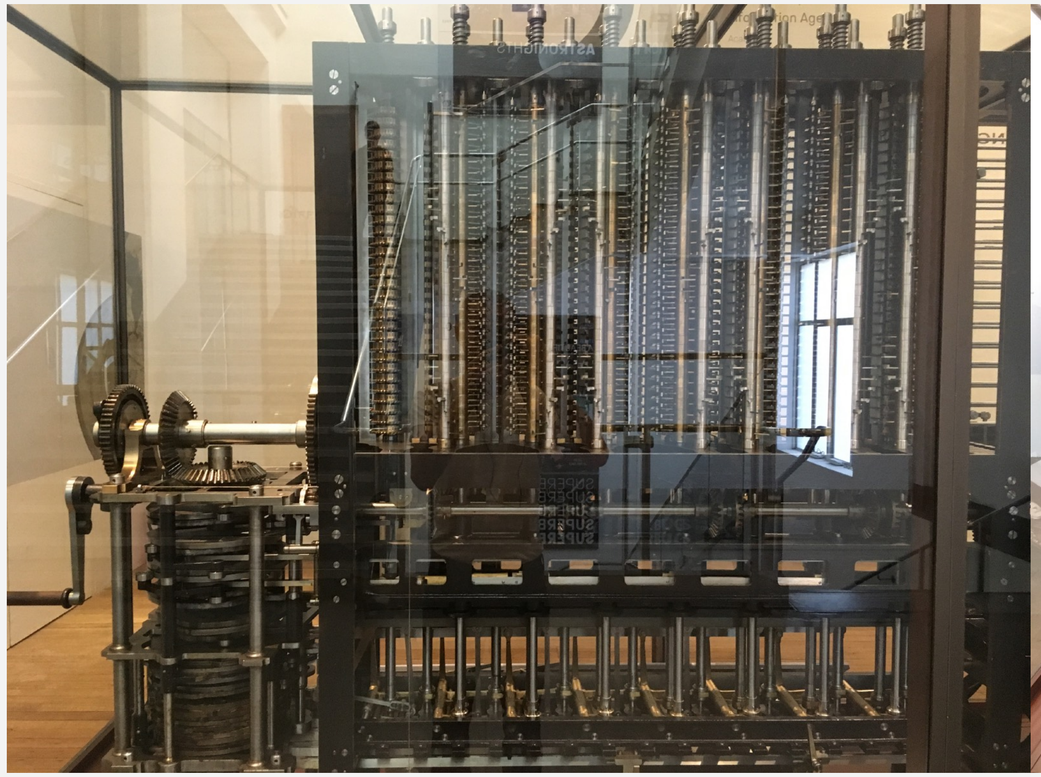


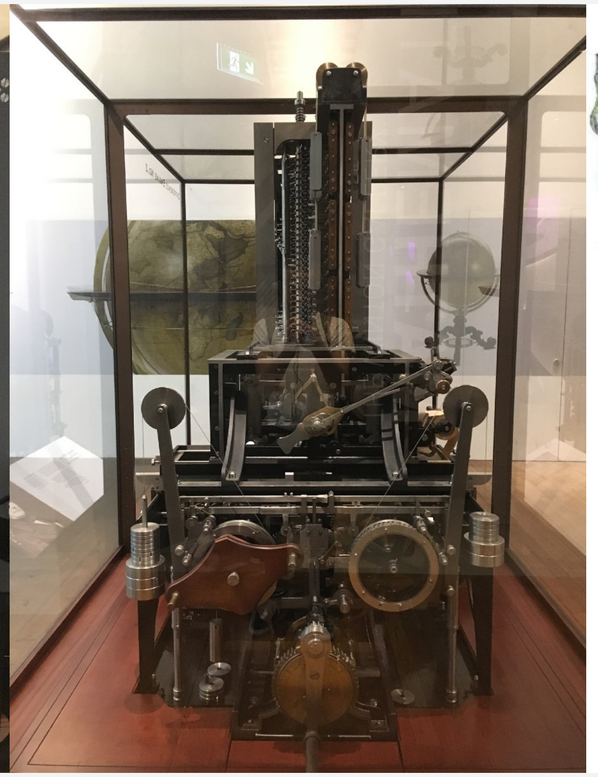


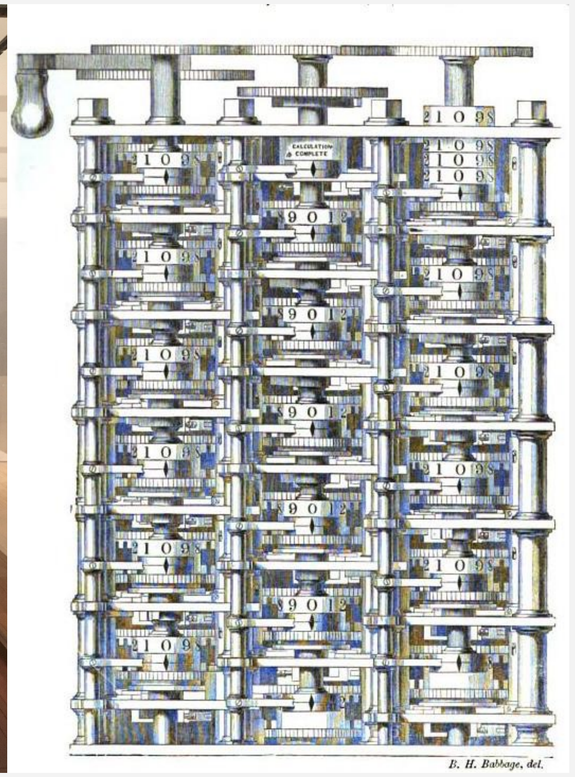
https://en.wikipedia.org/wiki/Motherboard



http://www.ic-cracker.com/reverse-mcu-ic-renesas-r5f2l388cnfp/reverse-mcu-ic-renesas-r5f2l388cnfp-2/







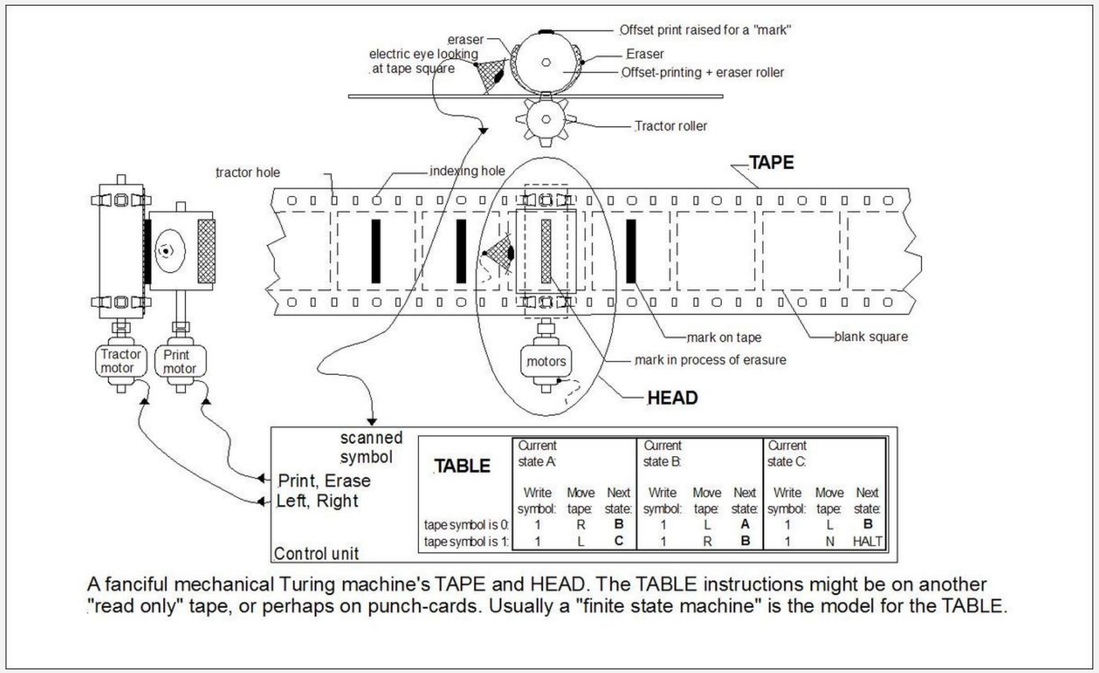
Charles Babbage

Difference Engine

~1822

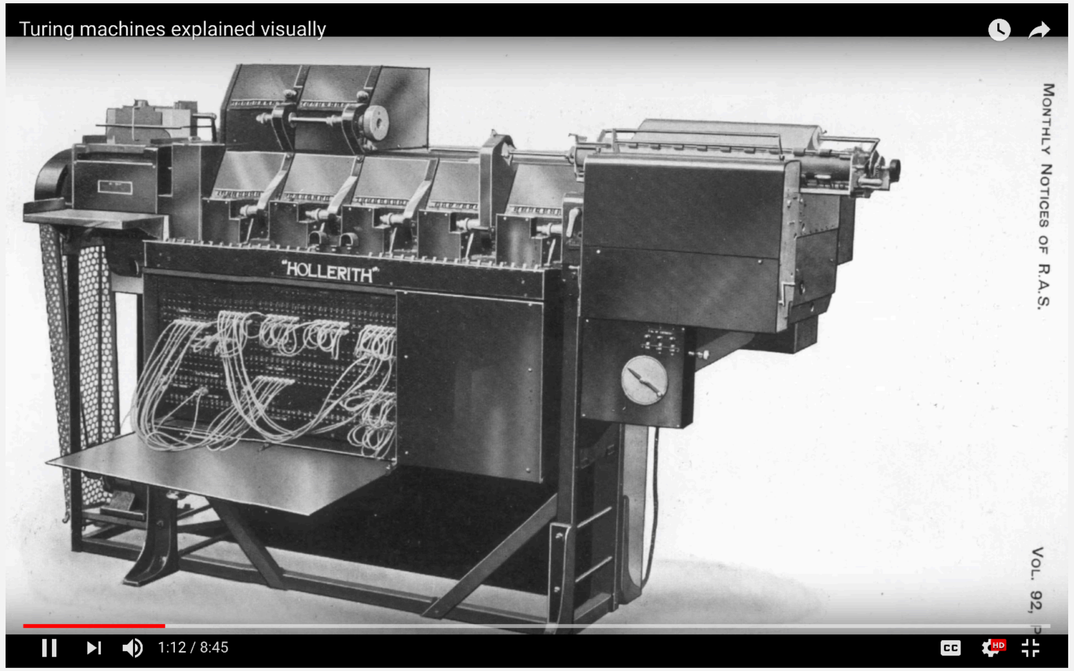
https://en.wikipedia.org/wiki/Difference_engine

TURING MACHINE



A fanciful mechanical Turing machine's TAPE and HEAD. The TABLE instructions might be on another "read only" tape, or perhaps on punch-cards. Usually a "finite state machine" is the model for the TABLE.

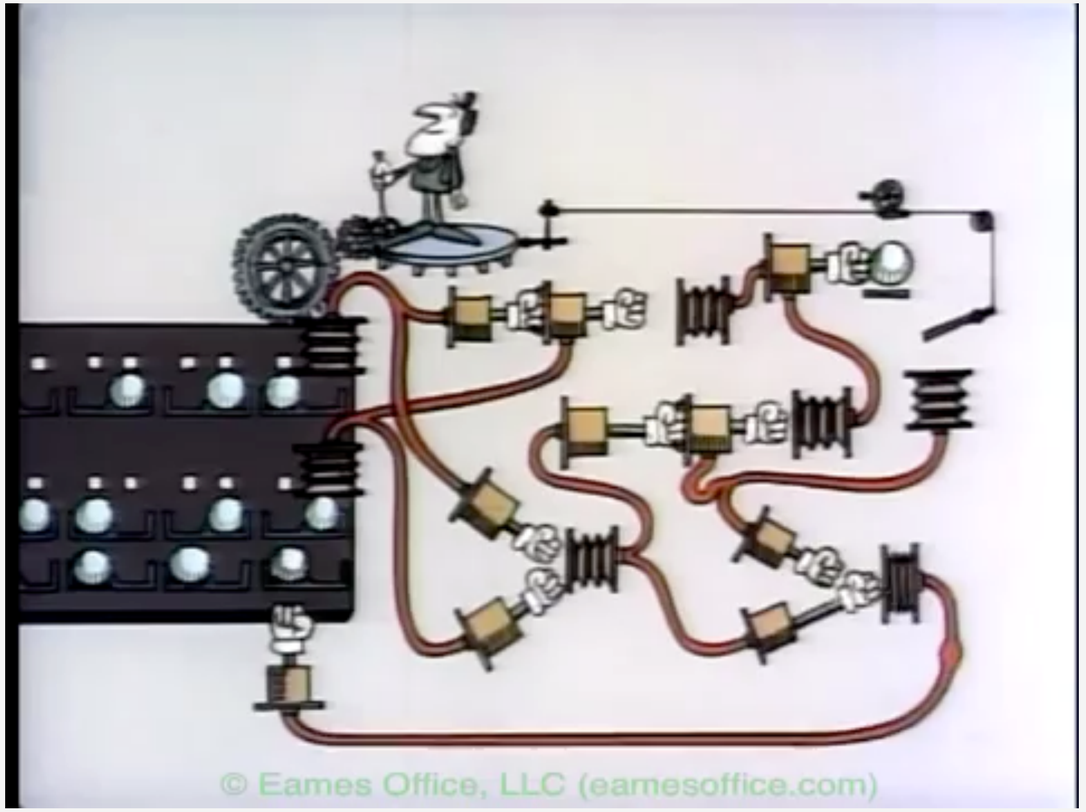
https://en.wikipedia.org/wiki/Turing_machine



https://www.youtube.com/watch?v=-ZS_zFg4w5k

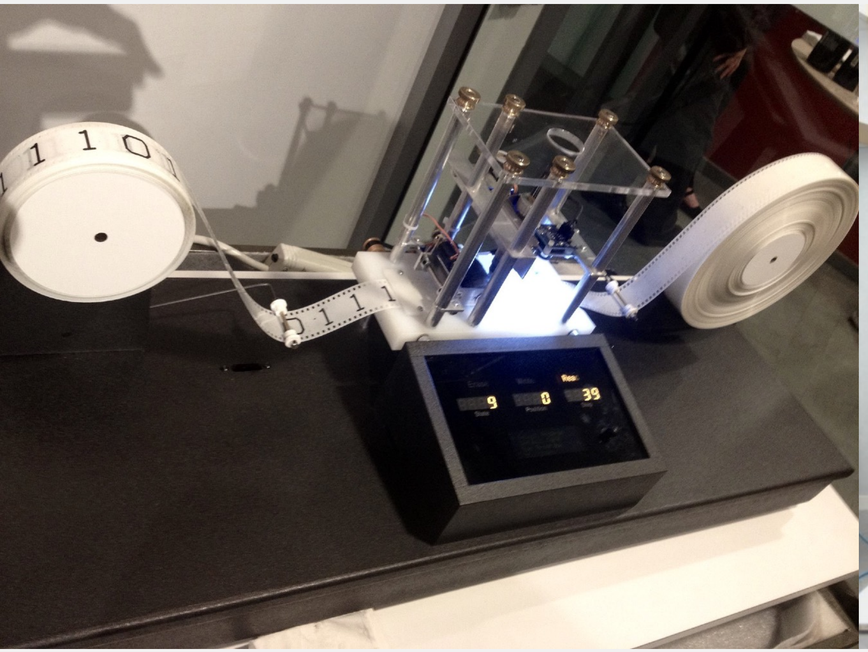
A COMPUTER GLOSSARY

Charles and Ray Eames 1966

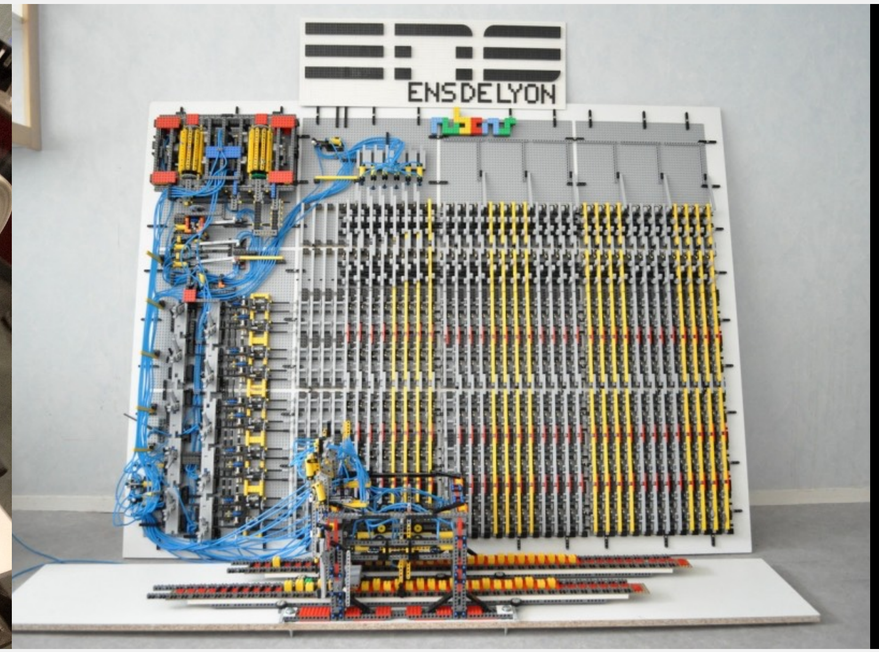


https://www.youtube.com/watch?v=eIgX6sPOqCY

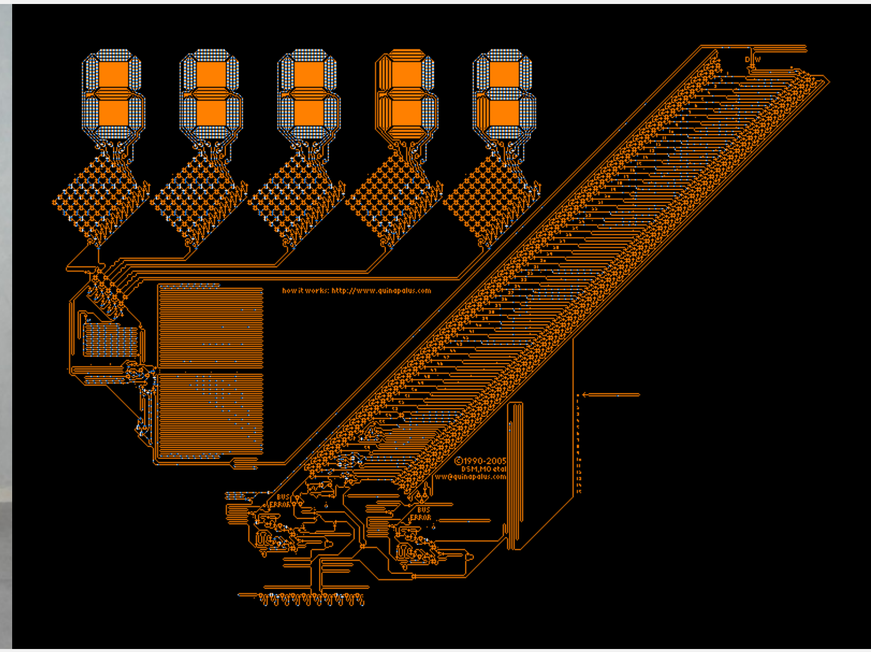
IMPLEMENTING A COMPUTER



Turing machine



in Lego



In software

[Computer Science with AGuy] Minecraft Advanced Quad-Core Redstone Computer v4.0 [200 sub special!]

THE BUILDING BLOCKS OF CODING 01

MEMORY **DECISION** ACTION REPETITION

DECISION

Conditional statements allow the program to **make decisions** while it is running

A decision is always made according to the **true/false** value of a statement

DECISION

(1 + 1 == 2)

`true`

DECISION

(2 + 2 == 5)

`false`

DECISION

```
var a;
```

a = 10 → put 10 in a

a == 10 → is a equal to 10?

DECISION

(mouseX **>** width/2)

`true`

Larger than operator

DECISION

((1 == 1) **&&** (1 == 2))

`false`

AND operator (**&&**) requires both sides to be `true`

DECISION

```
( ( 1 == 1 ) || ( 1 == 2 ) )
```

`true`

OR operator (**||**) requires at least one side to be `true`

DECISION

```
( 1 != 2 )
```

`true`

NOT Equal operator

DECISION

```
( !( 1 == 2 ) )
```

`true`

NOT operator (**!**) flips any statement

CONDITIONAL STATEMENT BLOCK

```
if( x > width ){
    x = 0;
}
```

CONDITIONAL STATEMENT BLOCK

```
if( mouseIsPressed ){
  point(mouseX, mouseY);
}else{
  background(0);
}
```

BOOLEAN DATA TYPE

```
var userHasClicked = false;
```

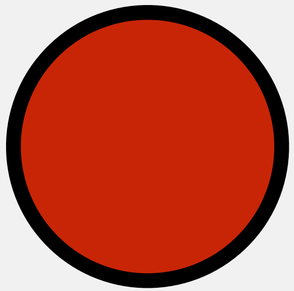
```
if( userHasClicked ){
   // Do something
}else{
   // Do something else
}
```

EXERCISE

```
var flagA = true;
var flagB = false;
var flagC = ( flagA && flagB );

var flagD = ( ( ( 1 + 1 == 3 ) || flagC ) && ( (!true) || ( 2 >= 2) ) ) ;
```

```
if(flagD){
   fill(0,255,0);
} else {
   fill(255,0,0);
}
ellipse(530, 720, 200, 200);
```



OVERVIEW

IF/ELSE STATEMENT

```
if( condition ){
   // do something
}else{
   // do something else
}
```

BOOLEAN DATA TYPE

```
var firstUse = true;
```

ASSIGN VS TEST

```
a = 10; // assign value to var
a == 10; // test if var is equal to value
```

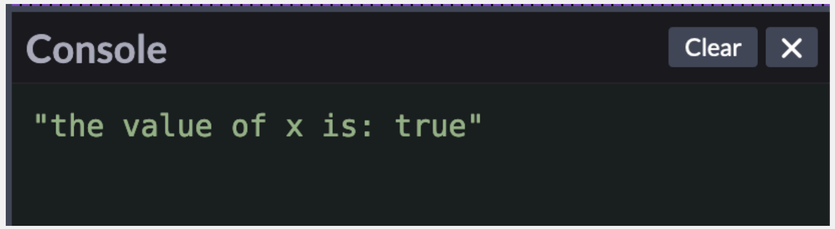
BOOLEAN OPERATORS

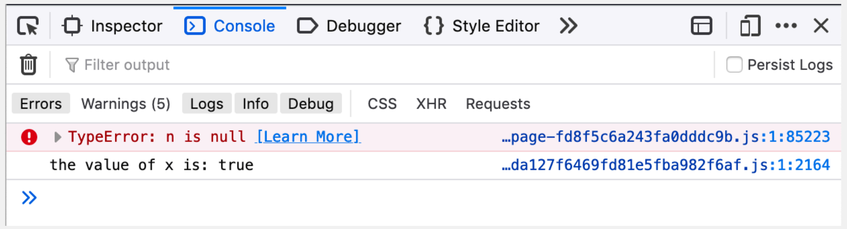
Is Equal to	a == b
Is Unequal to	a != b
Logical AND	a && b
Logical OR	a || b
Logical NOT	!a
Is smaller than	a < b
Is larger than	a > b
Smaller OR equal	a <= b
Larger OR equal	a >= b

PRINT / CONSOLE.LOG

```
var a = true;

print( ‘the value of x is: ‘ + a);
```





https://p5js.org/reference/#/p5/print

INPUT EVENTS

```
function mousePressed(){
  point(mouseX, mouseY);
}
```

https://p5js.org/reference/#/p5/mousePressed

INPUT EVENTS

```
function keyTyped(){
  if(key == 's'){
    save('result.png');
  }
}
```

https://p5js.org/reference/#/p5/keyTyped

HOMEWORK #3

Everyday activity

Please create an interactive P5 program that represents an everyday activity. It can be anything.

The program must take some **user input** (keyboard or mouse) and use it to perform an action.

+ Make **deliberate use** of programming tools (drawing commands, variables, conditions)

+ Use a distinct **visual language**

+ Do **visual story telling**