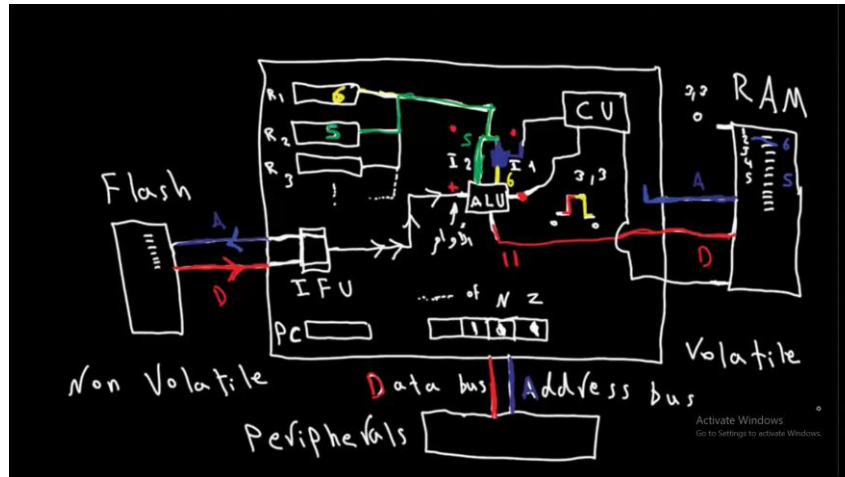


## V.4:

The instructor starts by a brief about Arduino which we will use then he illustrates what the ARM is which it is:

- Arithmetic and logic unit
- Registers (have many purposes and special jobs)
- Buses
- Nested vector interrupts controller
- Memory protection unit (MPU)
- Debugging

Then he contains by ARM inner structure and how it works



004 Processors structure [AR]

Complex Instruction Set Computers (CISC)	Reduced Instructions Set Computers (RISC)
عدد التعليمات كبير	عدد التعليمات قليل نسبياً
التعليمات معقدة قد تتخذ بعدة نبضات ساعة	التعليمات بسيطة تنفذ غالباً بنبضة ساعة واحدة
أنماط عنوان أكثر	أنماط عنوان قليلة نسبياً
العمليات يمكن أن تتم على الذاكرة مباشرة	العمليات تتم داخل مسجلات المعالج
حجم كبير	حجم صغير
استهلاك كبير للطاقة	استهلاك قليل للطاقة

44:45 / 50:47

comperhenssion between CISC and RISC

## V.5:

In this video we learn that are different number systems and know each system and how to convert from one to another:

- Decimal: 0 1 2 3 4 5 6 7 8 9
- Binary: 0 1
- Octal: 0 1 2 3 4 5 6 7
- Hexa decimal: 0 1 2 3 4 5 6 7 8 9 A B C D E F

Convert to decimal:

EX.1:  $(1011)_2: 1 \cdot 2^0 + 0 \cdot 2^1 + 1 \cdot 2^2 + 1 \cdot 2^3 = (11)_{10}$

Convert Hexa decimal to Binary:

0: 0000

1: 0001

2: 0010

3: 0011

A: 1010

E: 1110

F: 1111

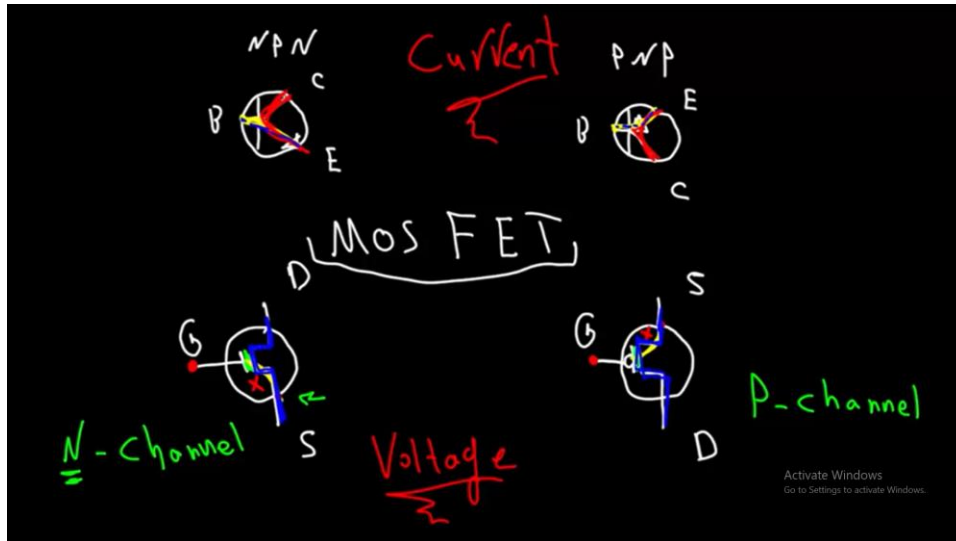
## V.6:

In this video we learn about electrical engineering basics which are:

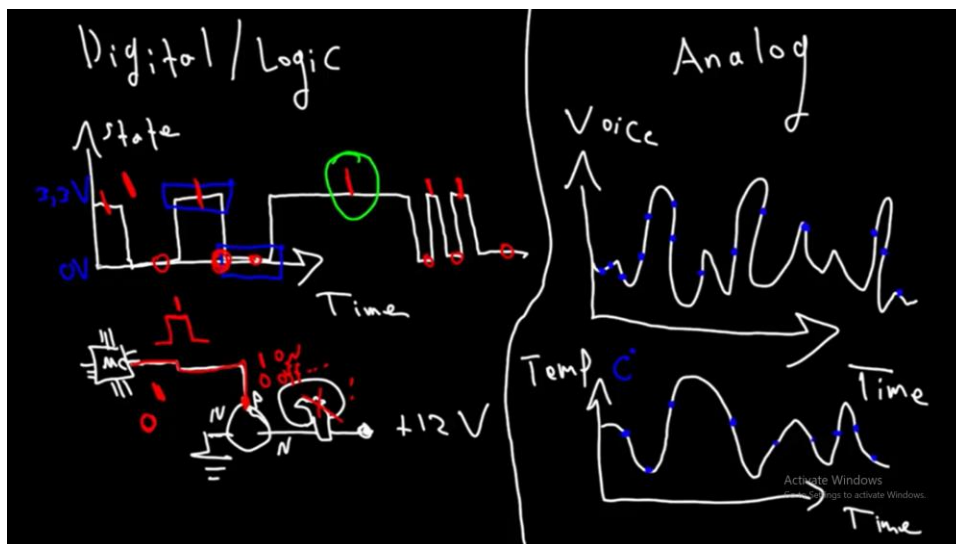
- Voltage (V) : Volt (V)
- Current (I) : Amper (A)
- Resistance (R): Ohm
- $V = I * R$
- Electrons direction is opposite to current direction
- Voltage divider:  $V_{out} = V_{in} * R2 / (R1 + R2)$

## V.7:

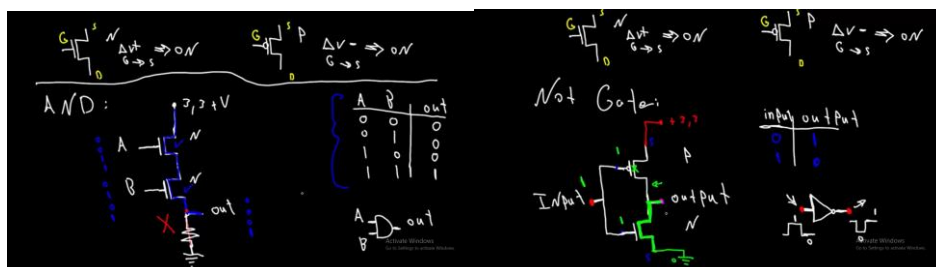
In the first, he starts by Transistor types:



Then difference between digital and analog:

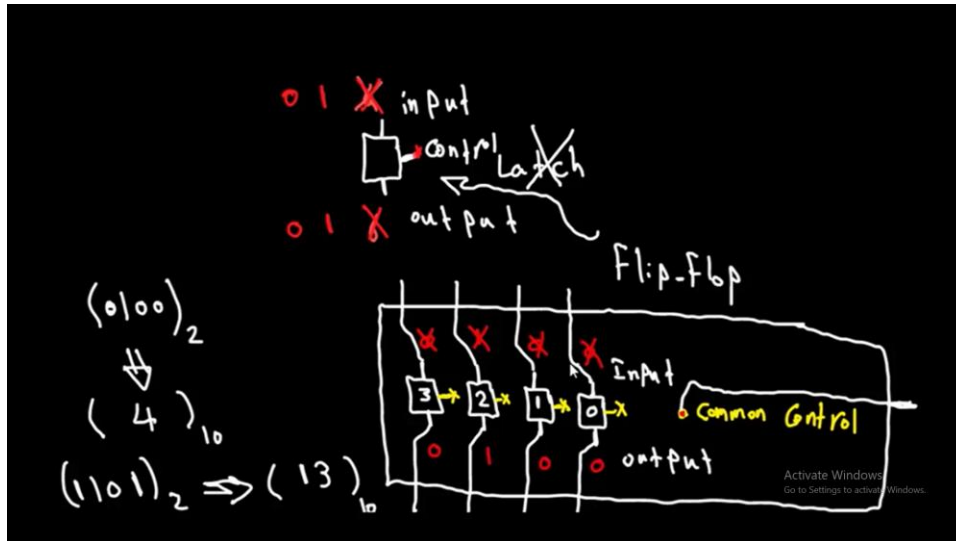


And at the end AND and NOT gates:

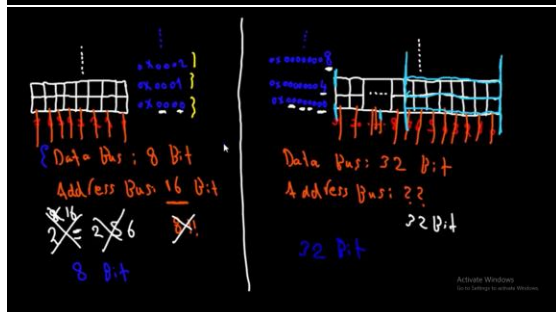
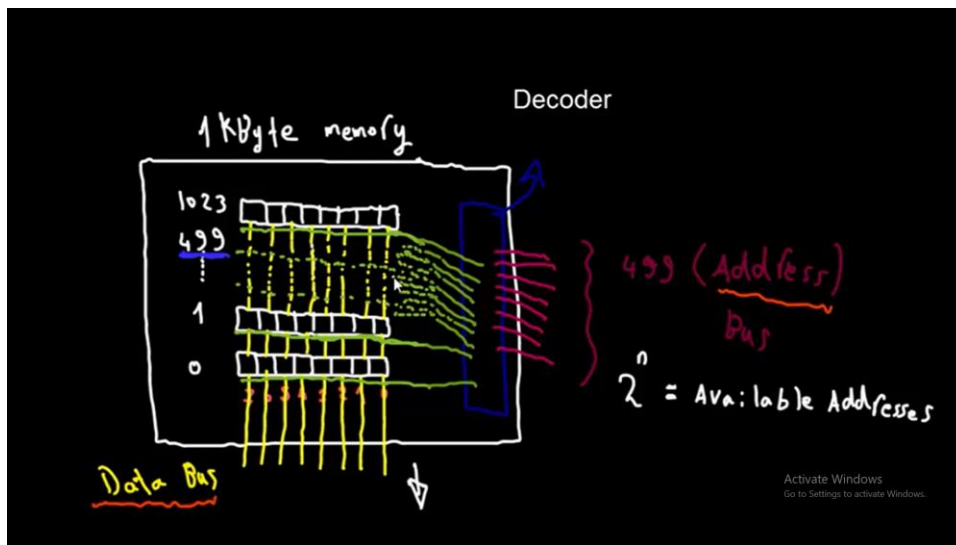


## V.8:

- Volatile memory: likes RAM which stores data until unplugged current



- non-volatile memory: likes flash and HDD which stores data even if unplugging current



Difference between 8bit and 32bit memory