EEA-Multimeter Winter Project.

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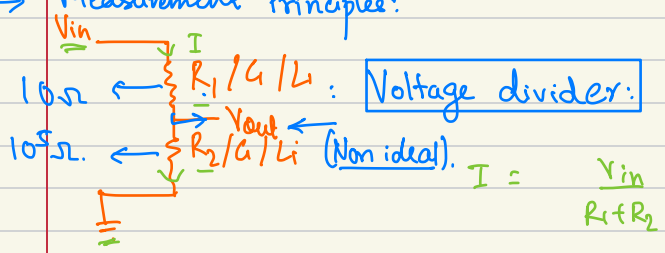
Beginner Track

Intermediate Track:

→ Electrical Fundamentals:
(L, C, R Circuits)

→ Passive Components:
(L, C, R circuits;)
→ Same theorey as Class 12 JEE
so please feel
free to revise or
ping me and ill teach.

→ Measurement Principles:




Voltage divider:

$I = \frac{V_{in}}{R_1 + R_2}$

$\frac{1}{j\omega C} = X_C$.

$V_{out} = I \cdot R_2$

frequency: AC voltage:

$V_{out} = V_{in}\left(\frac{R_2}{R_1 + R_2}\right)$.

given: $R_2$

given: $V_{out}$

given: $V_{in}$

given: $R_1 + R_2$

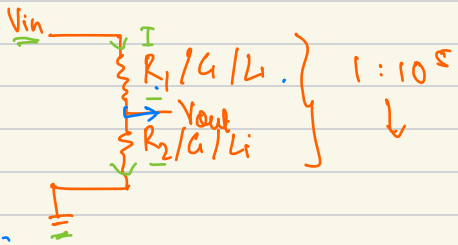
find out:

$V_{out} = V_{in}\left(\frac{X_{C_1}}{X_{C_1} + X_{C_2}}\right)$ ?

Vin : 5V.
GND : 0V

$R_1$ : 10 Ω
$R_2$ : $10^5$ Ω.

Vout : ? . 4.99950 ←
↳ Measure? .




Least Count : Arduino Analog Port : Least count

$\Rightarrow \frac{1}{64}$ V. $\Rightarrow$ 0.015625 V ←

Arduino : Dad's SUV : → F1 track (Poorly Perform).

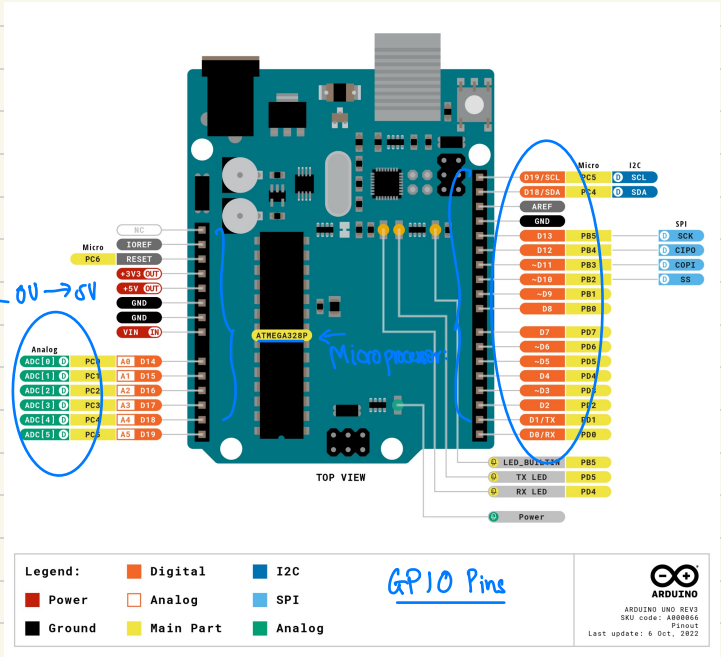
go anywhere  won't breakdown

Custom Setup : Not easily available
Self programmed
No peripherals :

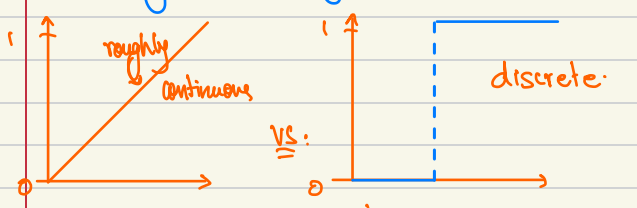
1. Voltage Divider Circuit :

2. Precision Bottleneck :

# Measure Using an Arduino:




## Analog vs Digital




↳ temperature of your room

↳ State of lights in your room

# Precision:

Computer Stores binary:

N: 8 7 6 5 4 3 2 1 ... (32)

fixed: 8 bit: : 64 bit:
: 32 bit:

Memory:

size

limits bits:

$2^0$ to $2^8 - 1$: Integers:

1 1 1 1 1 1 1 1 ← binary → 63 decimal:

COST: Exponentially proportional to bit size:

64gb memory → $64 \times 10^9$ bits only

8Kb: 1970's

2Tb:

64 bit ← $10^9$ numbers

$\frac{32\ Kb}{8b} = 4000$

64 → 99K
128 → 109K
256 → 139K
} Cost: