Extra Class 2

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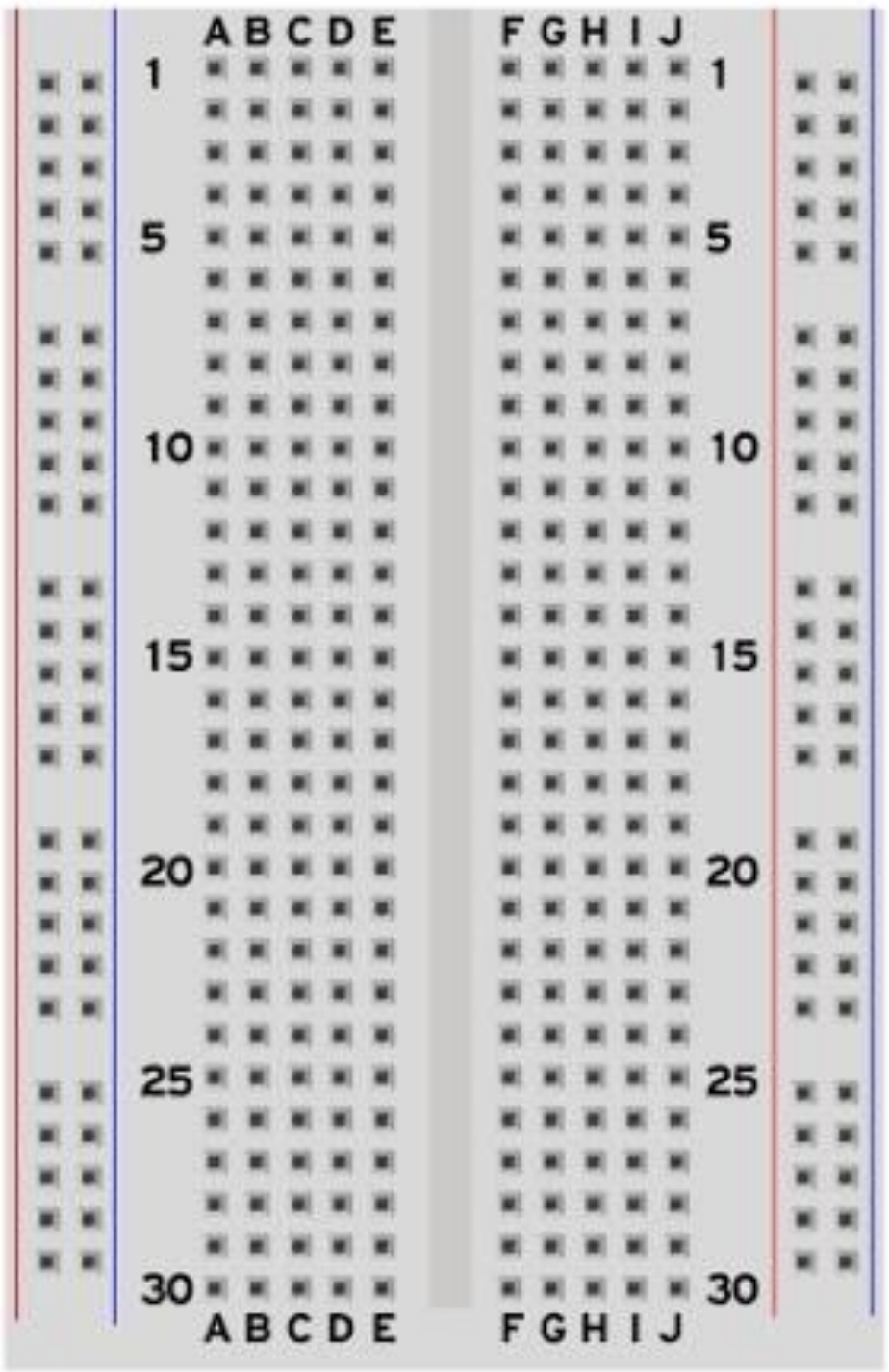
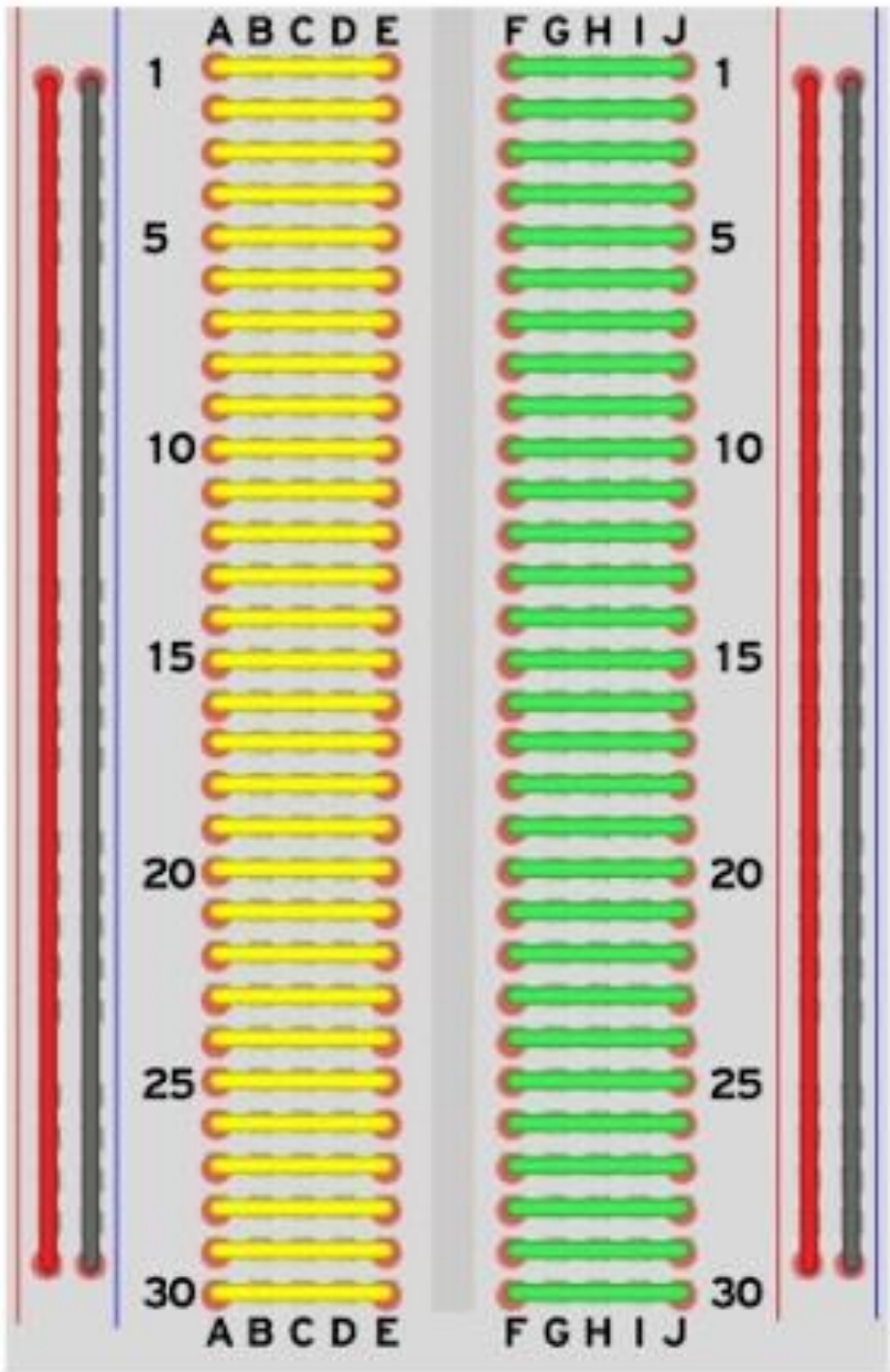
CSE, RUET

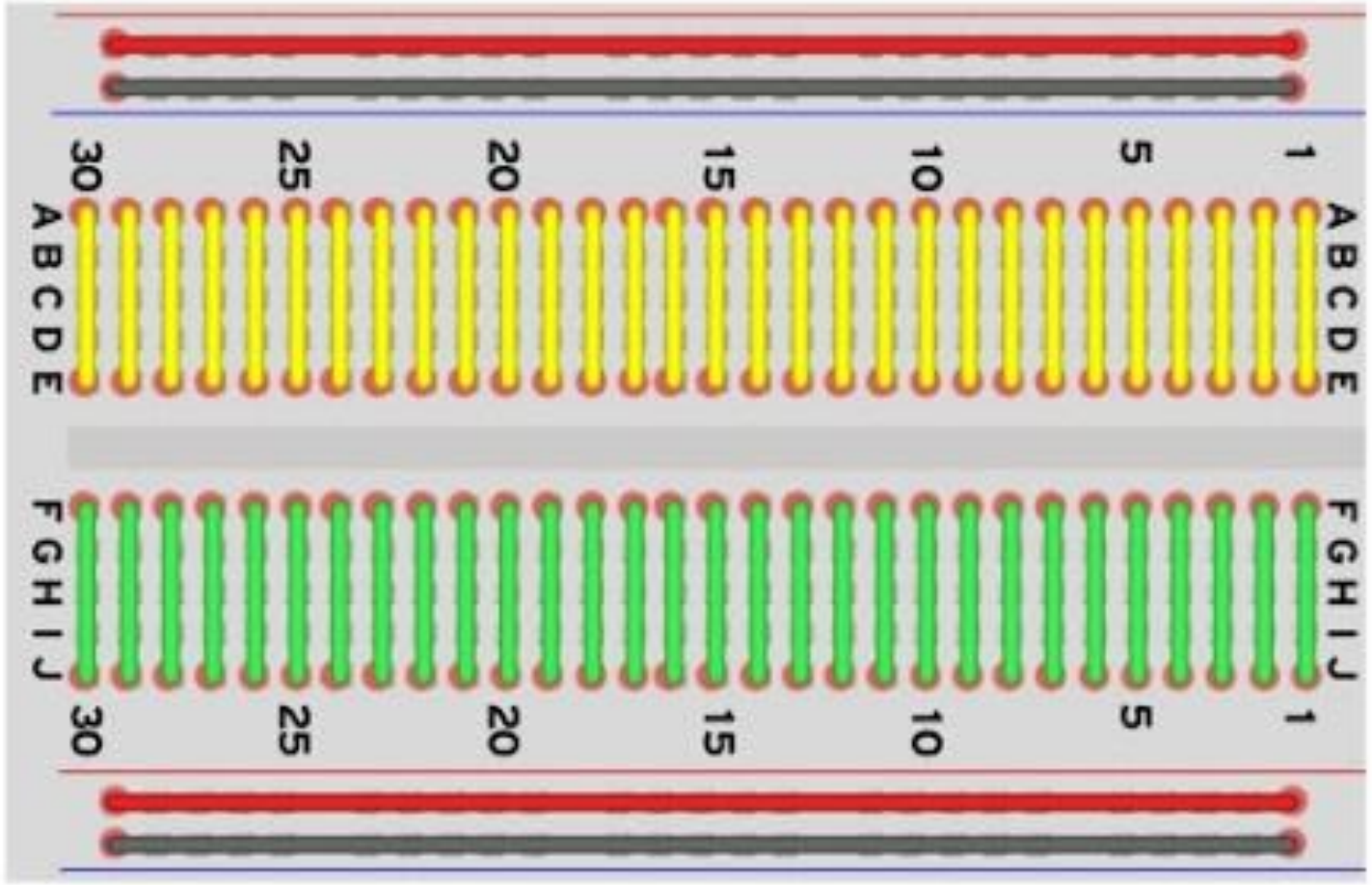
প্রশ্নঃ Breadboard এর কাজ কি?

উত্তরঃ A breadboard is a construction base for prototyping of electronics.


A B C D E
F G H I J
1
5
10
15
20
25
30

প্রশ্নঃ Breadboard কিভাবে Use করে?


A B C D E
F G H I J
1
5
10
15
20
25
30


30
25
20
15
10
5
1
A B C D E
F G H I J
Used for prototyping
Used for
power supply.

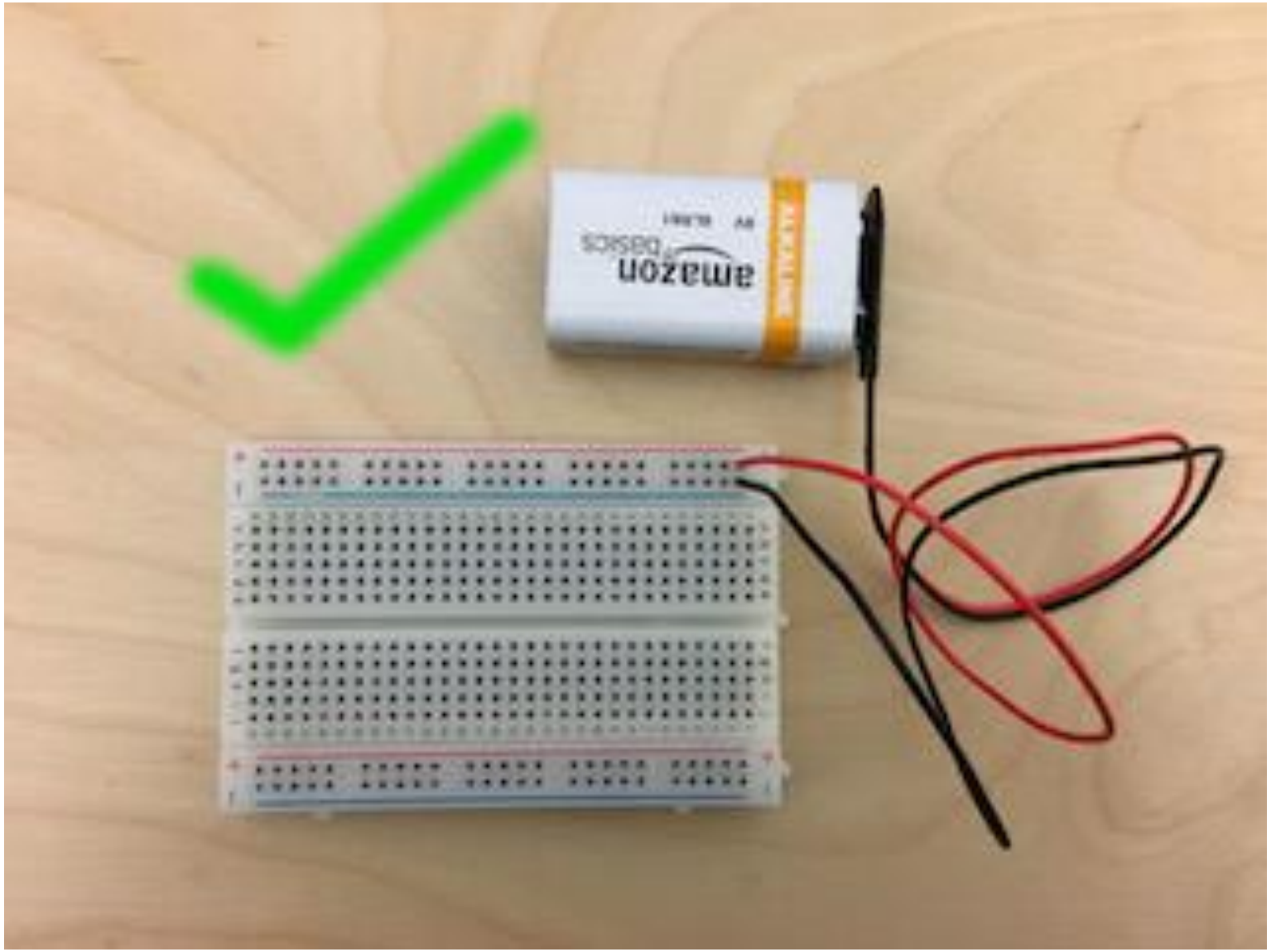
প্রশ্নঃ Breadboard এ Power Supply কিভাবে দিবো?

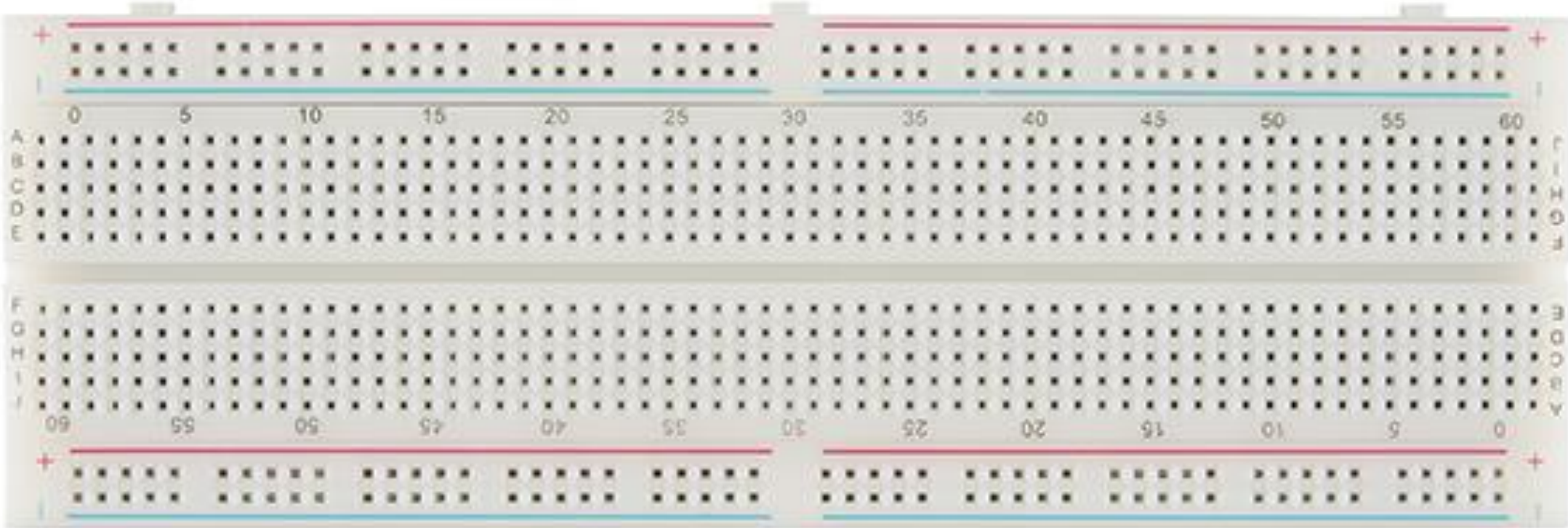
9V Battery

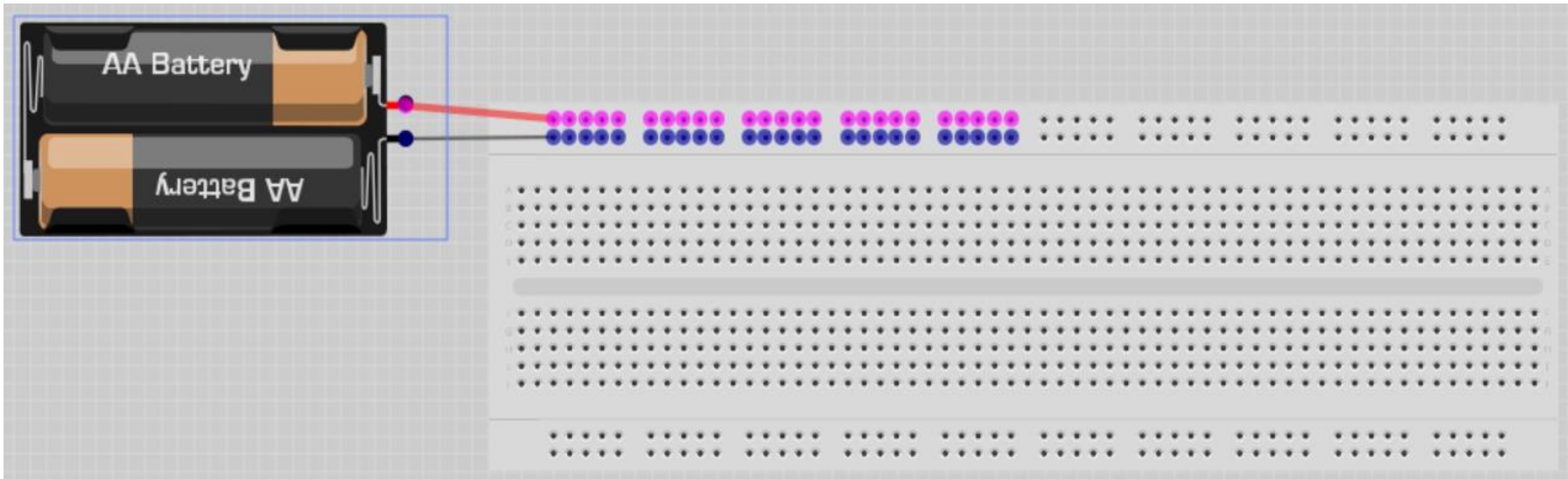
9V Battery

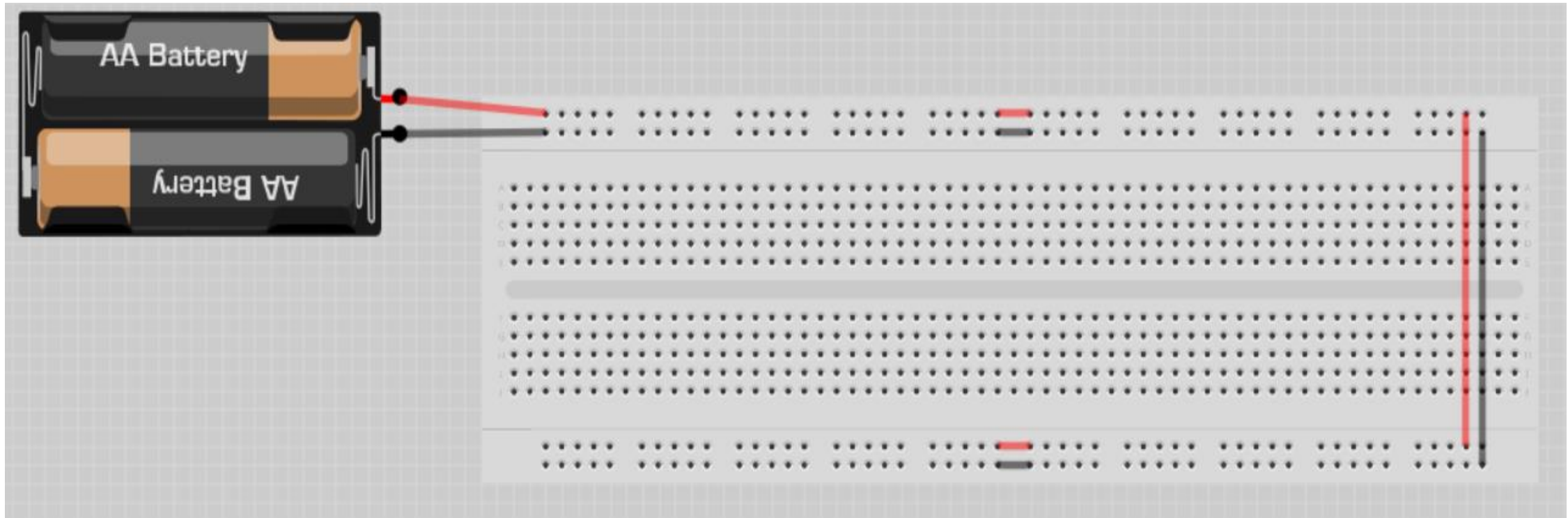
+

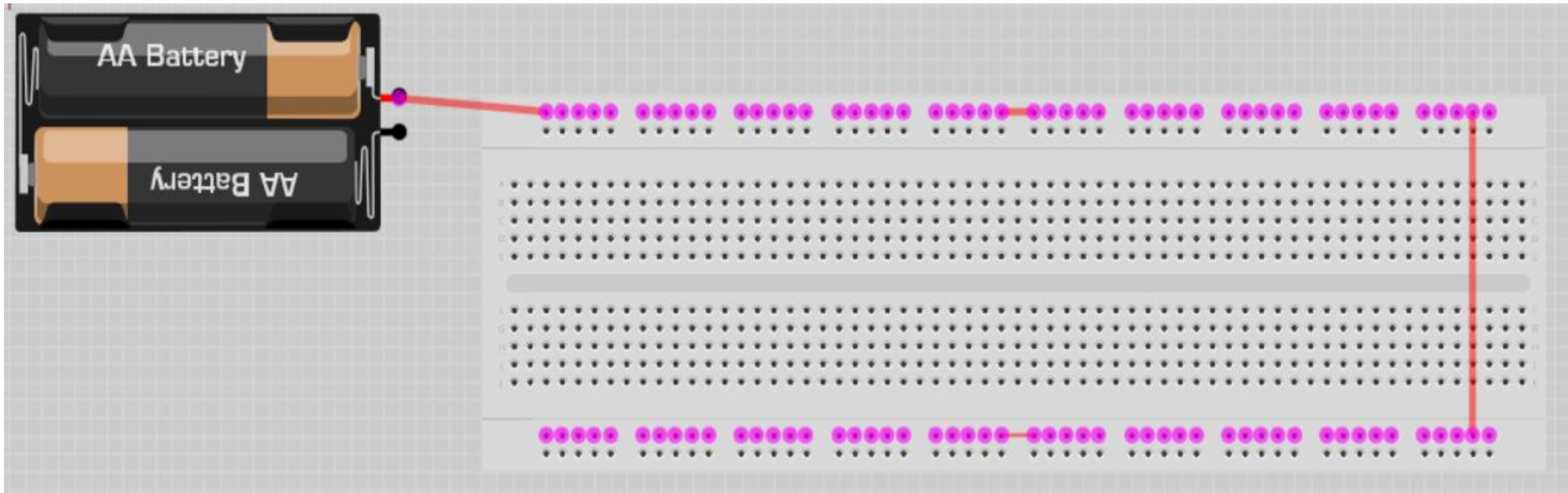
Connector

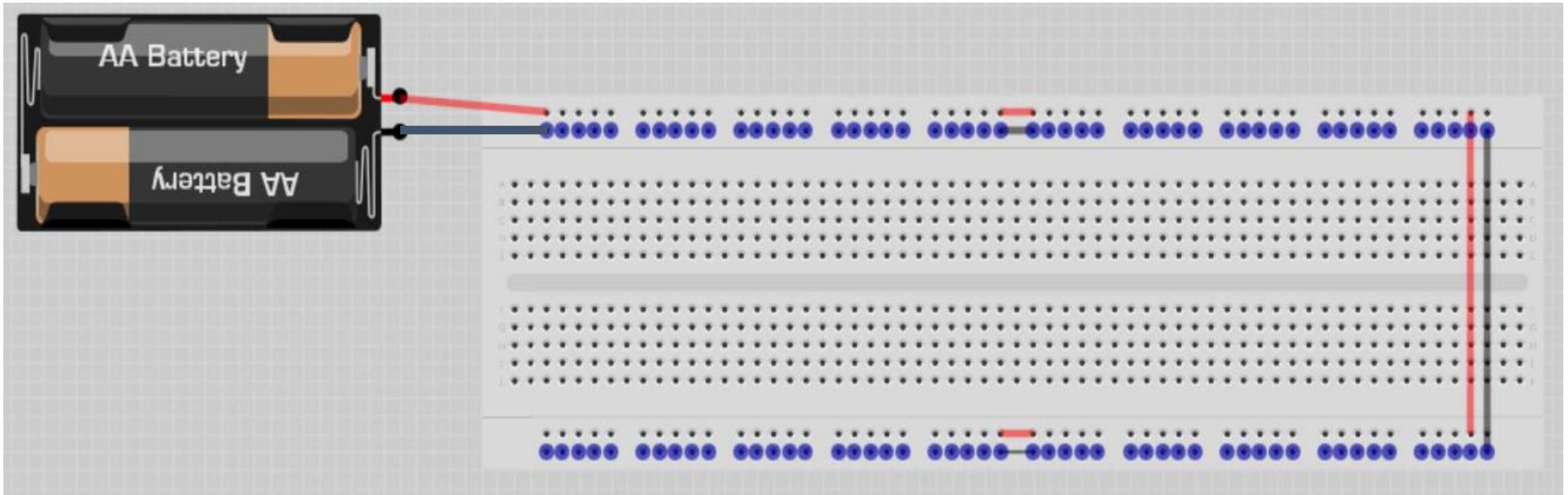

amazon basics


0 5 10 15 20 25 30 35 40 45 50 55 60
A B C D E
F G H I J
J I H G F
E D C B A
60 55 50 45 40 35 30 25 20 15 10 5 0

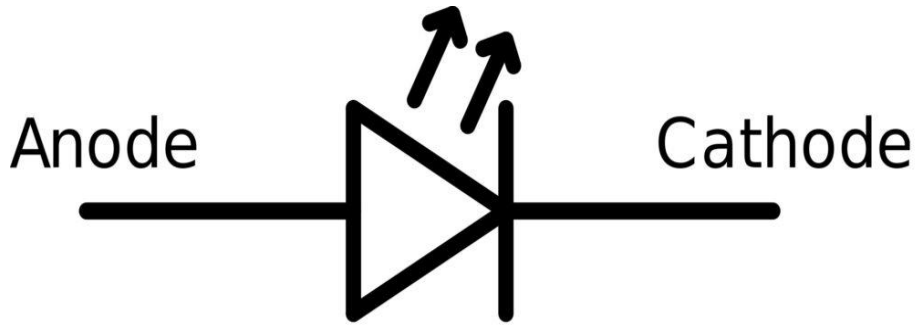

AA Battery
AA Battery

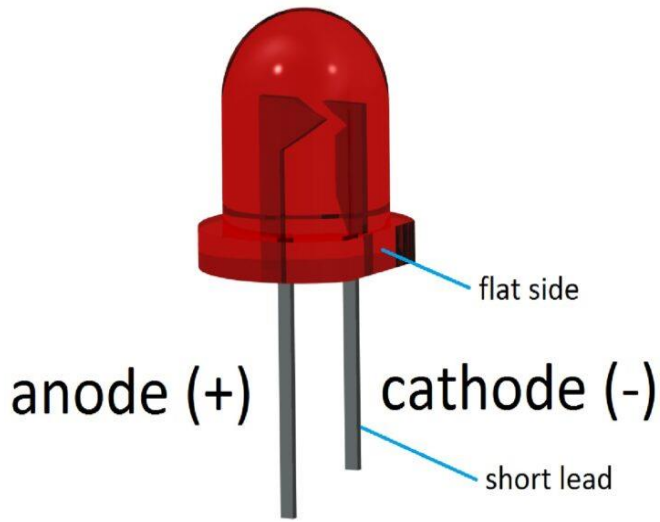

AA Battery
AA Battery


AA Battery
AA Battery

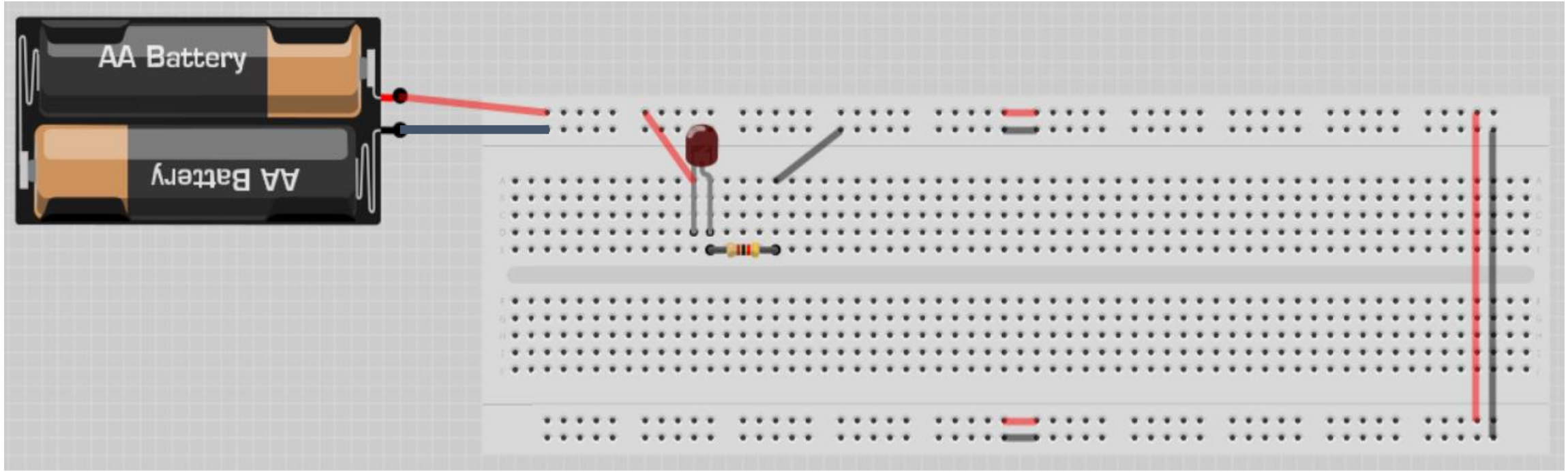

AA Battery
AA Battery

প্রশ্নঃ Breadboard এ কিভাবে LED জালাব?


Anode
Cathode


flat side
anode (+)
cathode (-)
short lead

উত্তরঃ



প্রশ্নঃ Digital Electronics Project এর জন্য কি IC ব্যবহার করব?

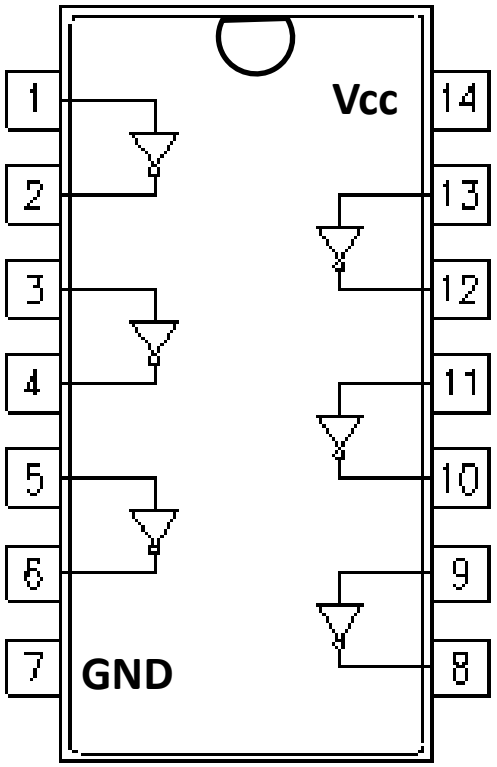
উত্তরঃ

7404 IC
It has 6 NOT gates.

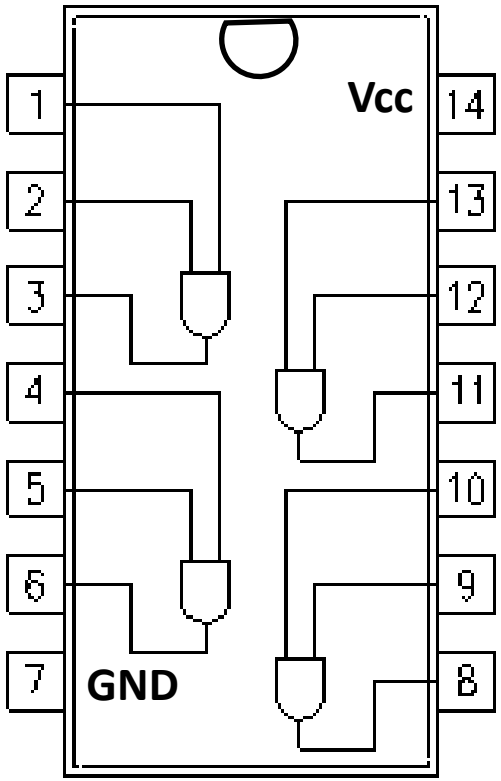
7408 IC
It has 4 2-input AND gates.

7432 IC
It has 4 2-input OR gates.

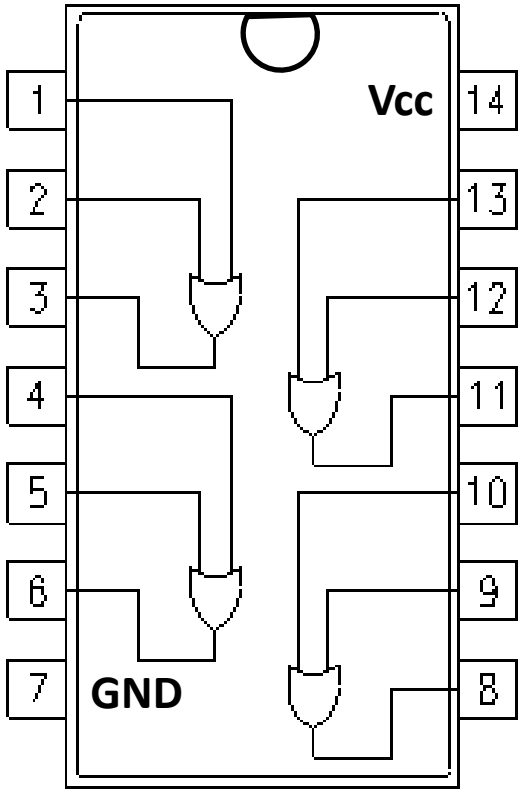
উত্তরঃ



7404 IC
It has 6 NOT gates.



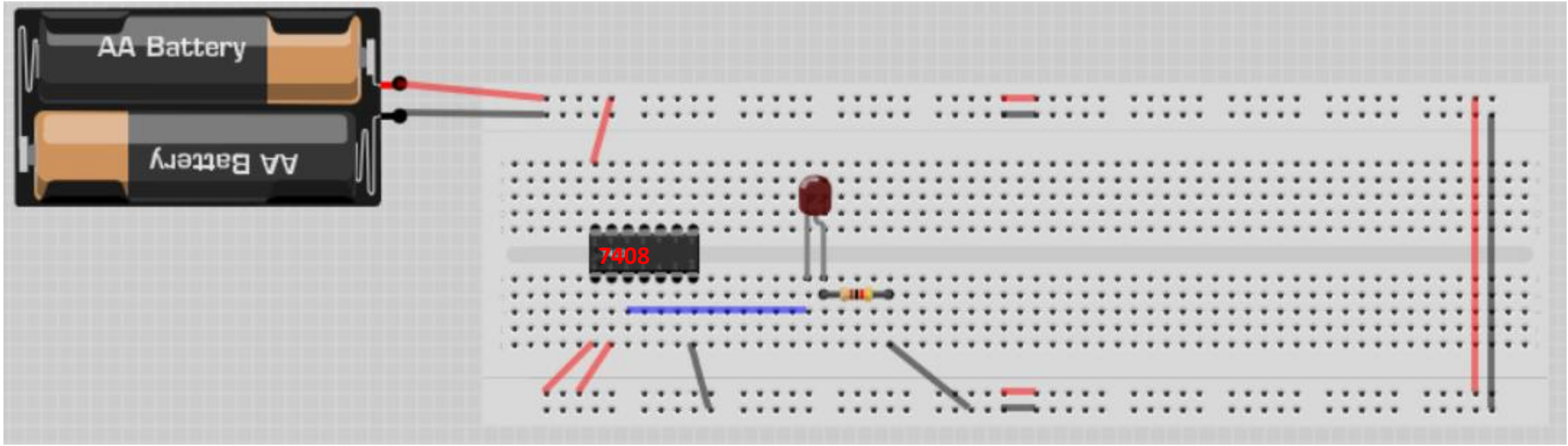
7408 IC
It has 4 2-input AND gates.



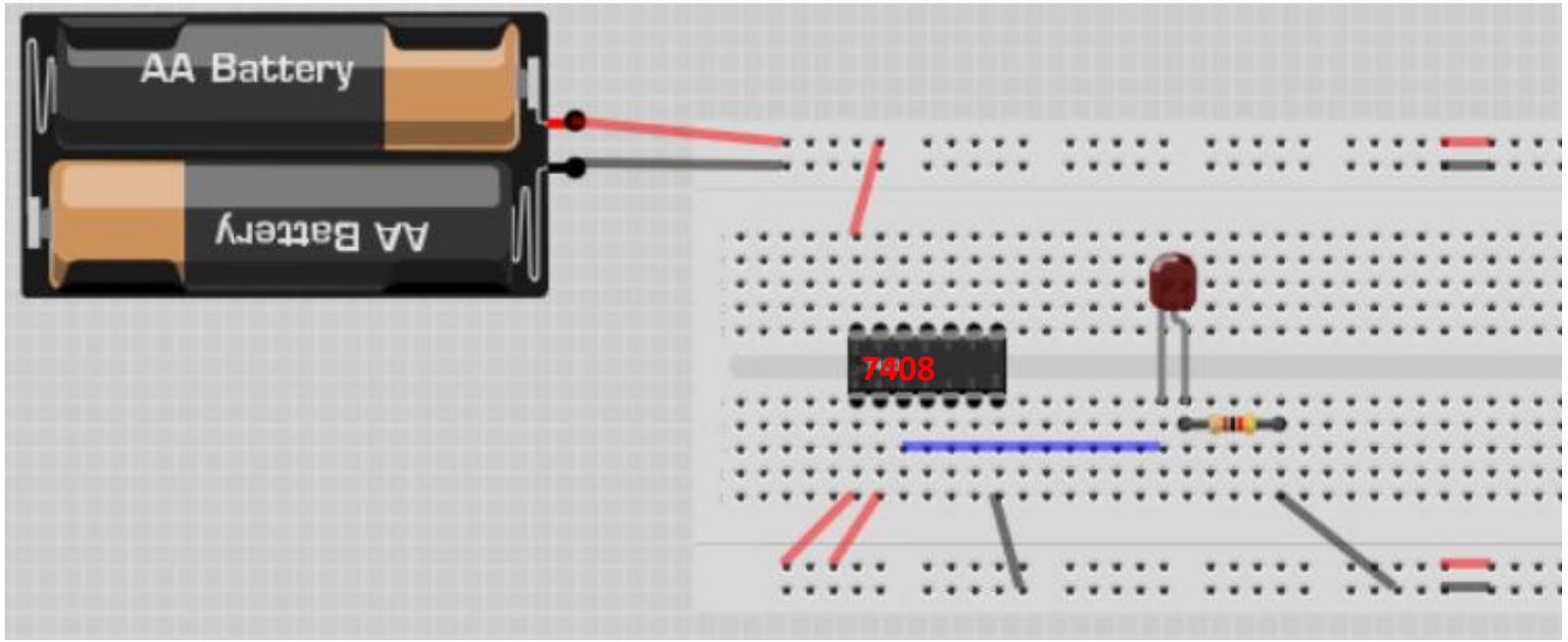
7432 IC
It has 4 2-input OR gates.

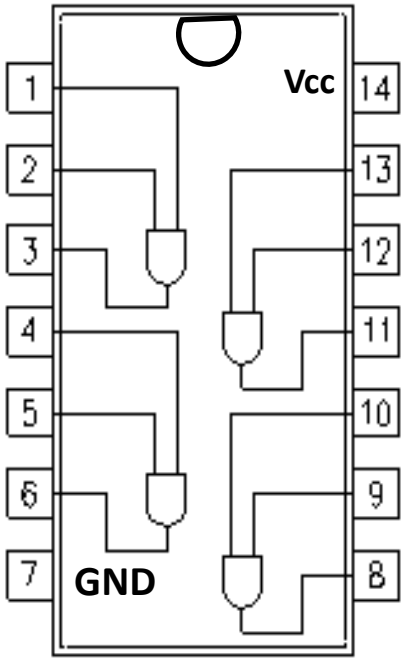
প্রশ্নঃ Show use of 2 input AND gate in breadboard.

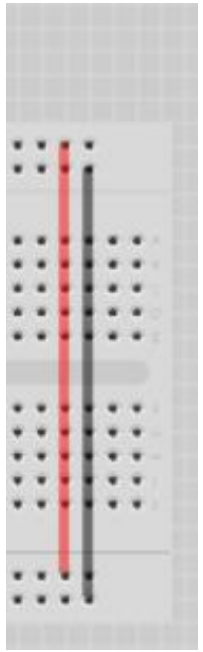
2 input AND Gate



2 input AND Gate

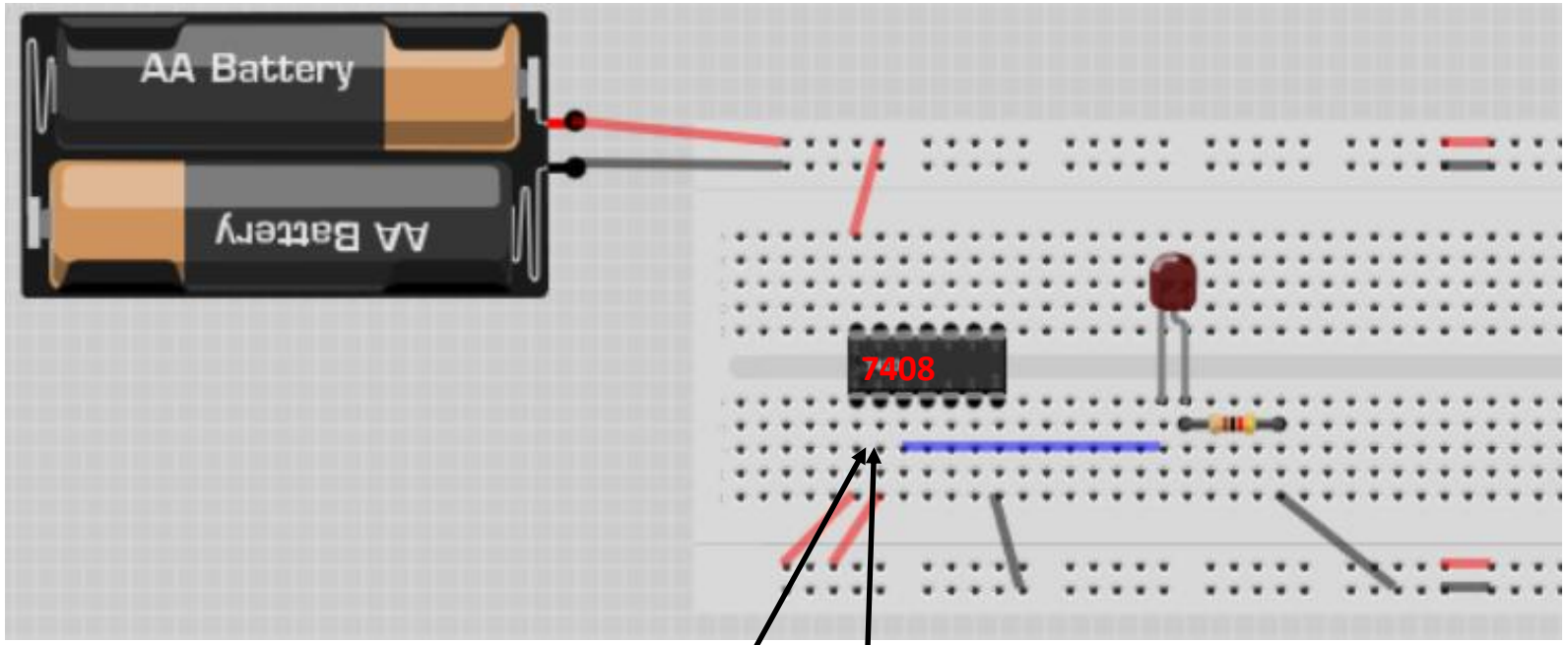


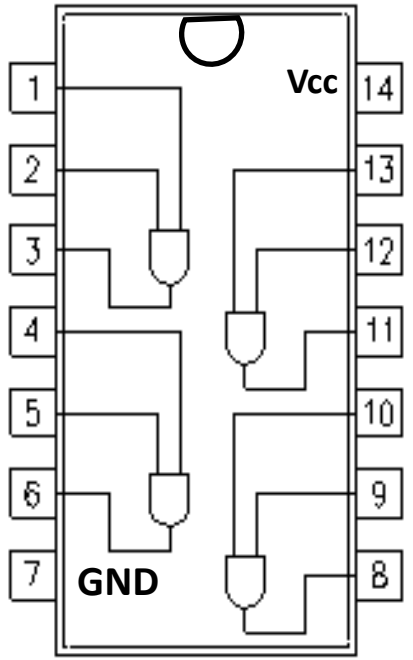


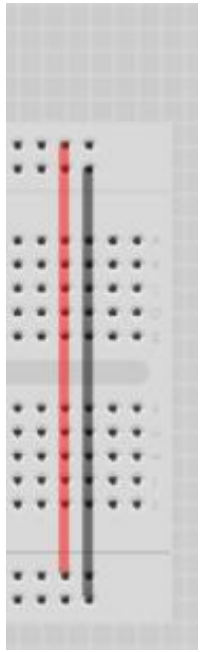


7408 IC
It has 4 2-input AND gates.

2 input AND Gate

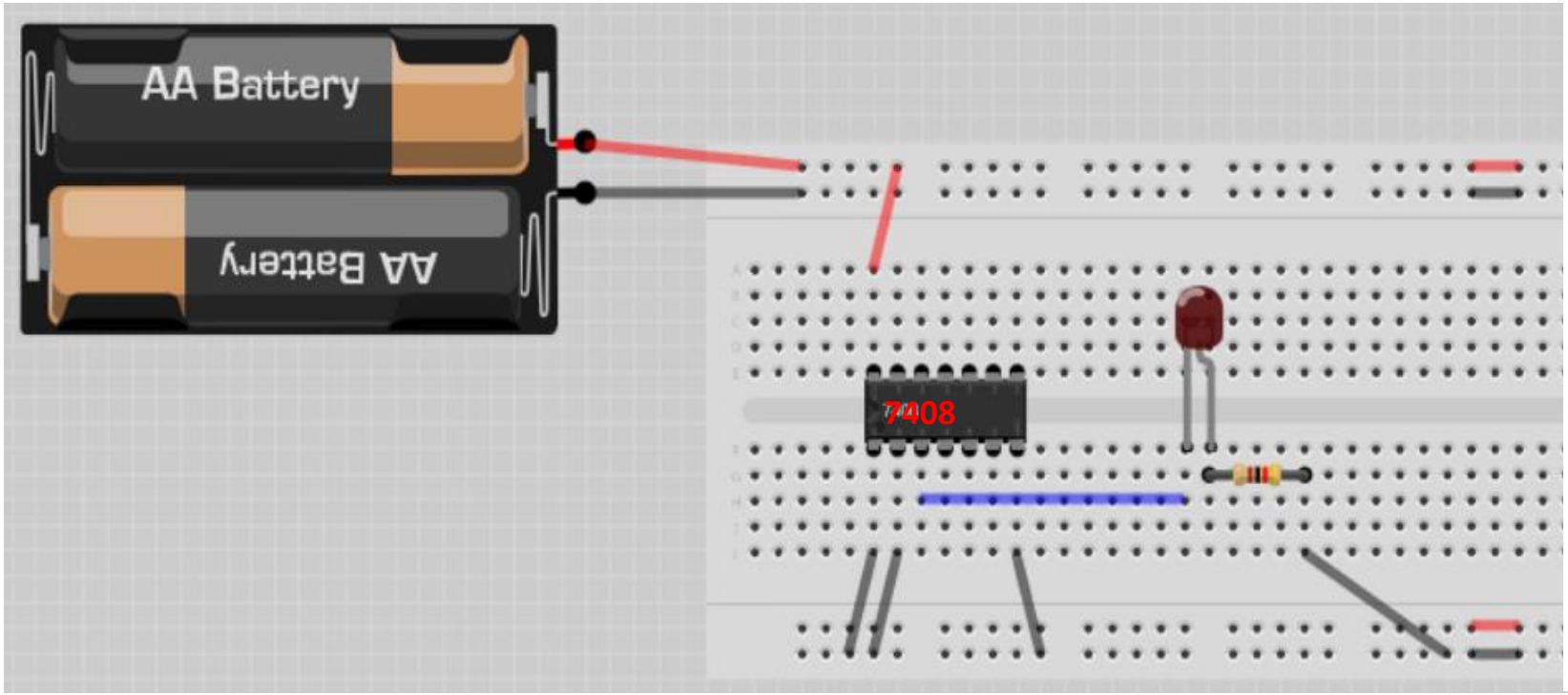


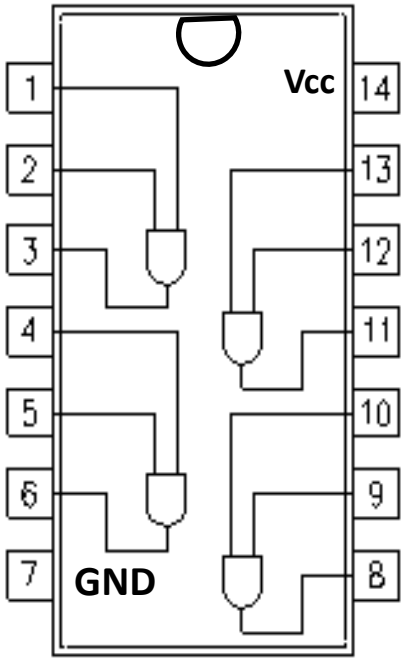


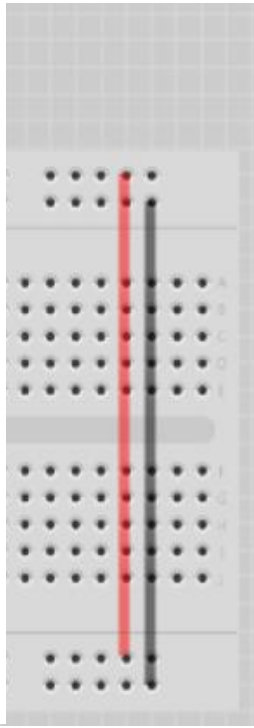


7408 IC
It has 4 2-input AND gates.

2 input AND Gate



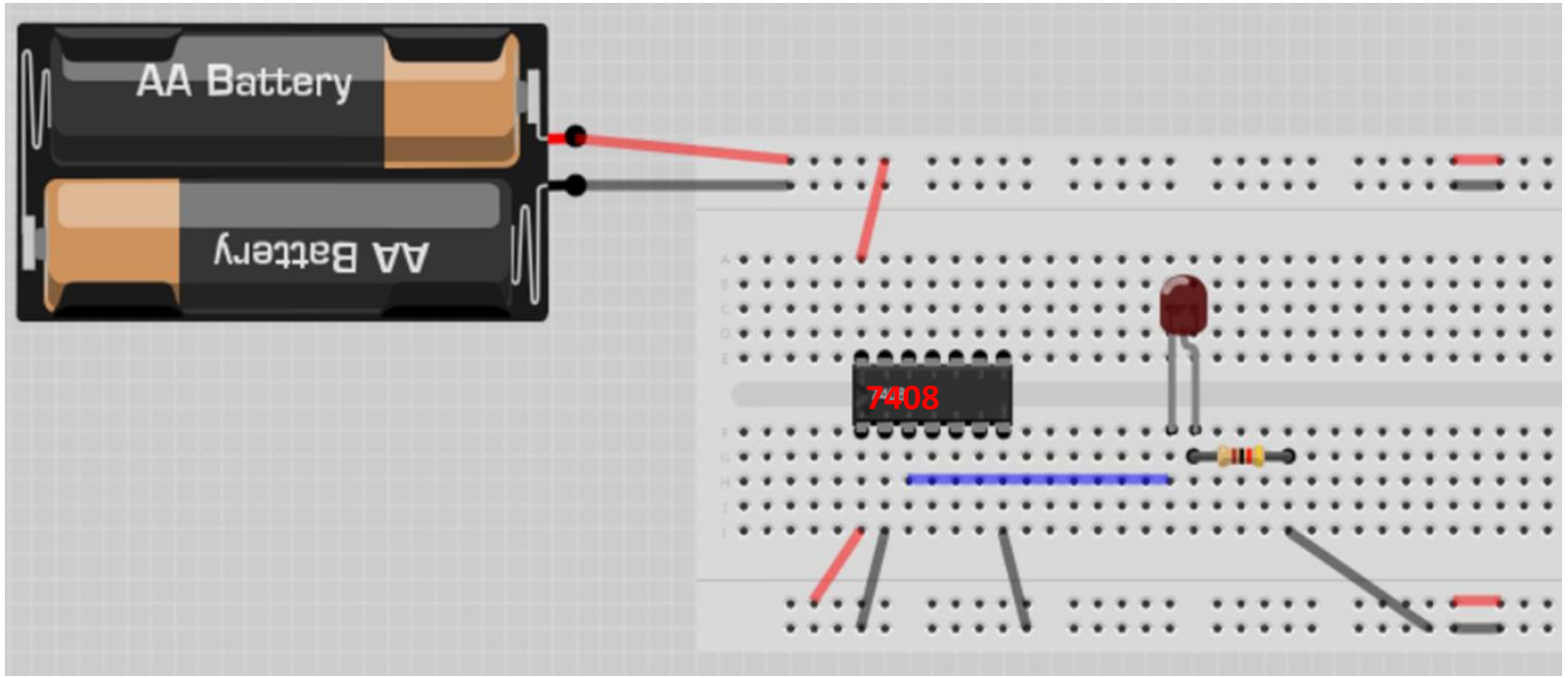




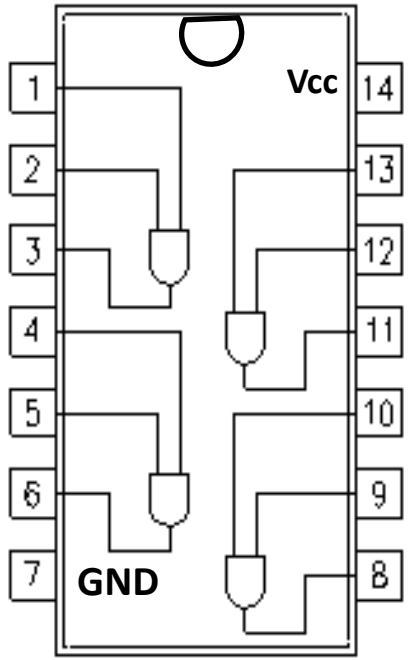
A=0V B=0V

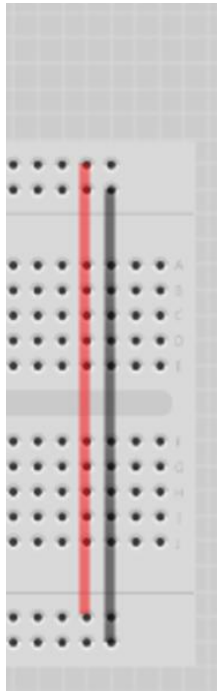
7408 IC
It has 4 2-input AND gates.

2 input AND Gate



A=9V B=0V





7408 IC
It has 4 2-input AND gates.

Q: Is chip getting hot?

Ans: Recommended voltage supply for 7400 series IC is 5V.

Using 9V as voltage supply can damage chip in the long run.

Ans: Solution is to use a voltage regulator.

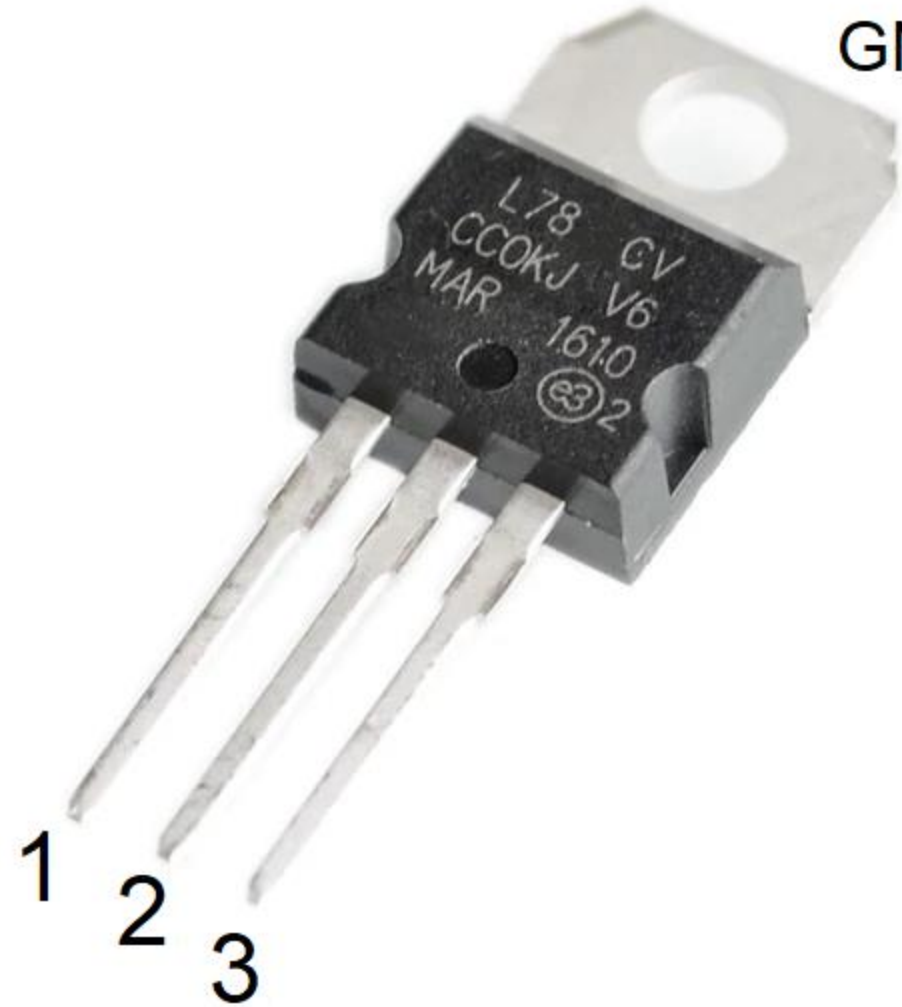
We will be using 7805 IC as voltage regulator.

TO-220 (package)

IC 7805

Pin Details

GND



1. Input
2. GND
3. Output

Q: Why is LED on even after removing one of input wires?

Ans: Because when input wire is removed, that input pin is now floating (0V or +5V).

This is more confusing.
Sometimes, some wires can be disconnected even if it seems it is connected.

প্রশ্নঃ How can we solve this problem?

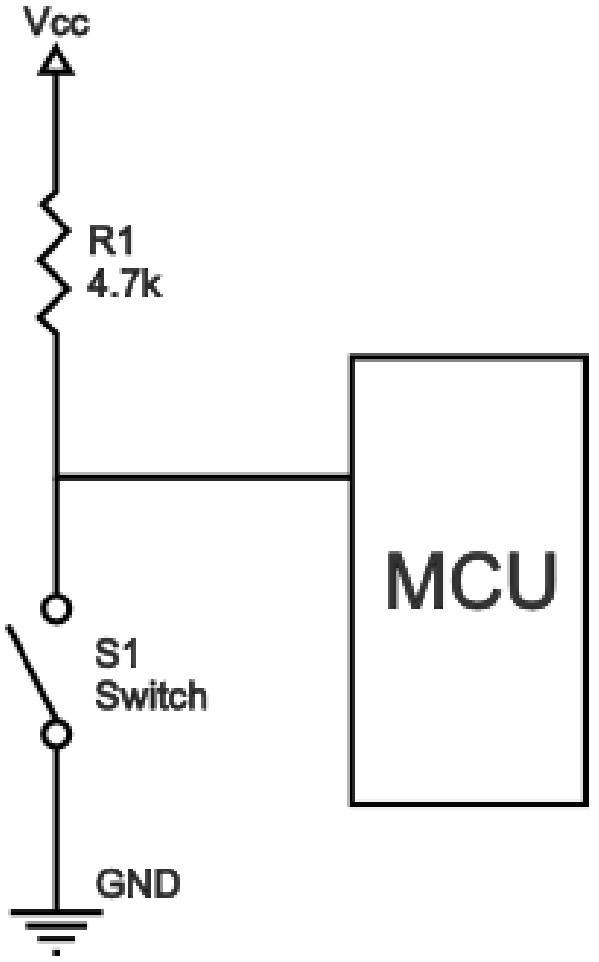
Ans:

Using pullup resistor (Default value will be +5V)

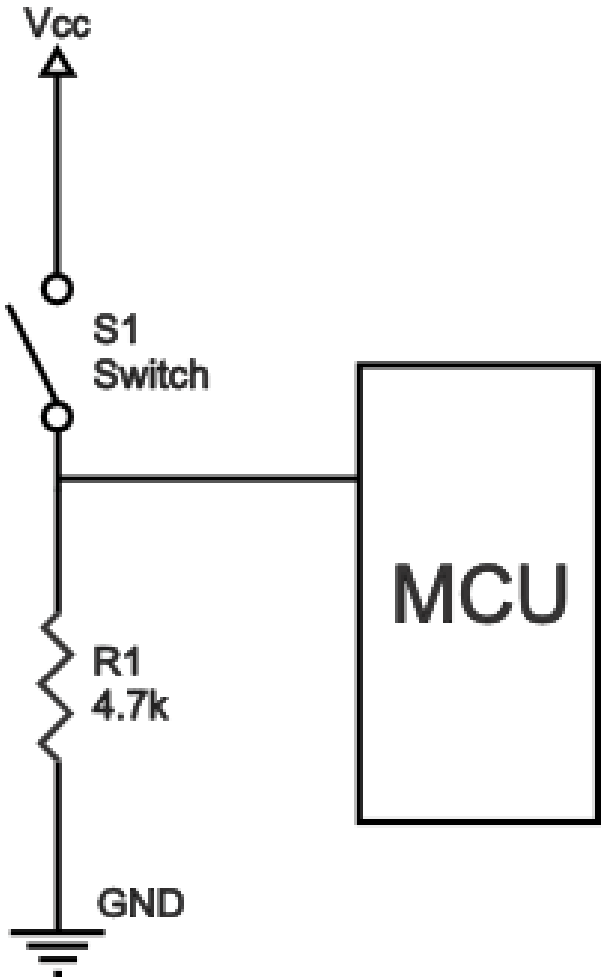
OR

Using pulldown resistor (Default value will be 0V)

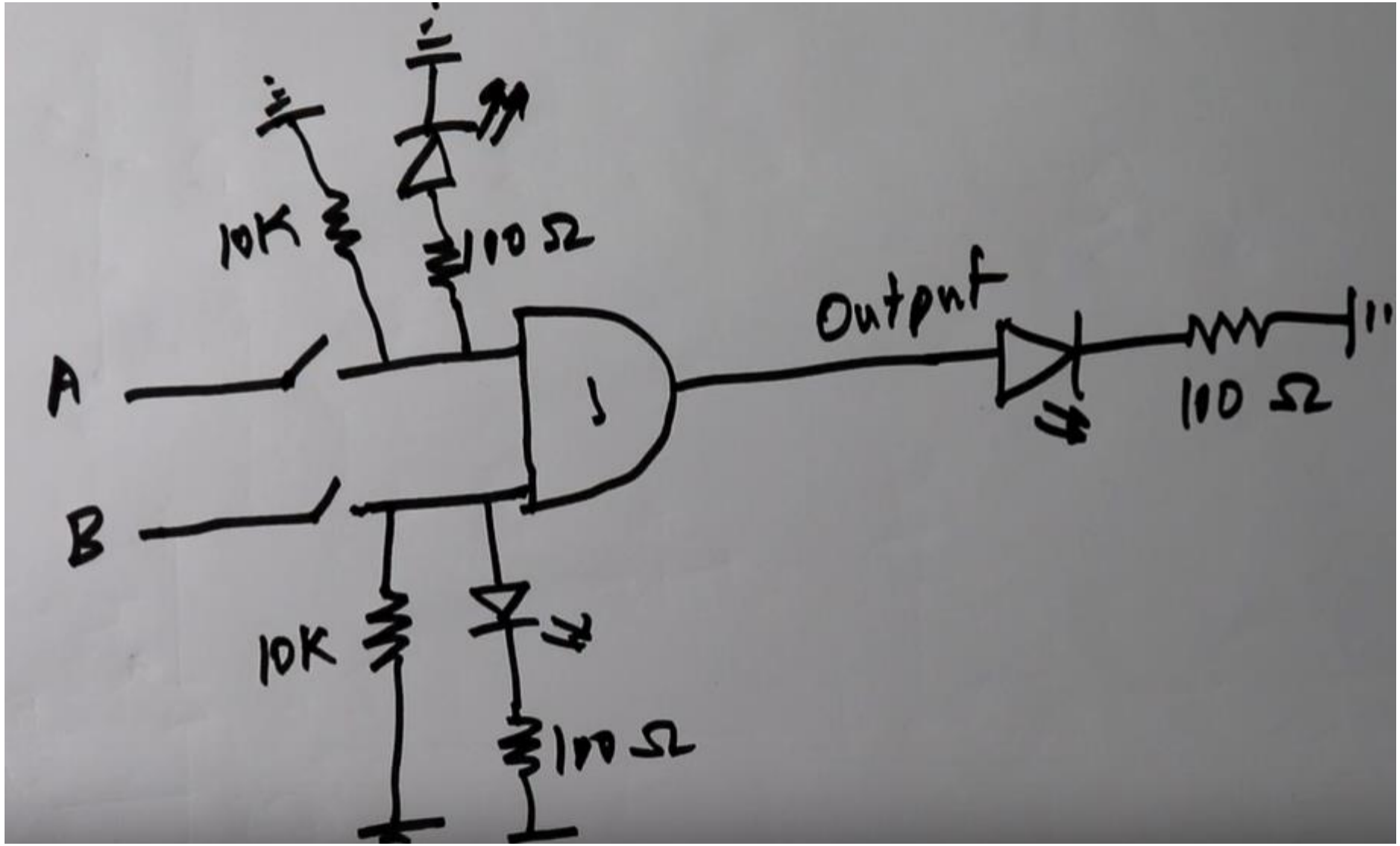
Pullup Resistor



Pulldown Resistor

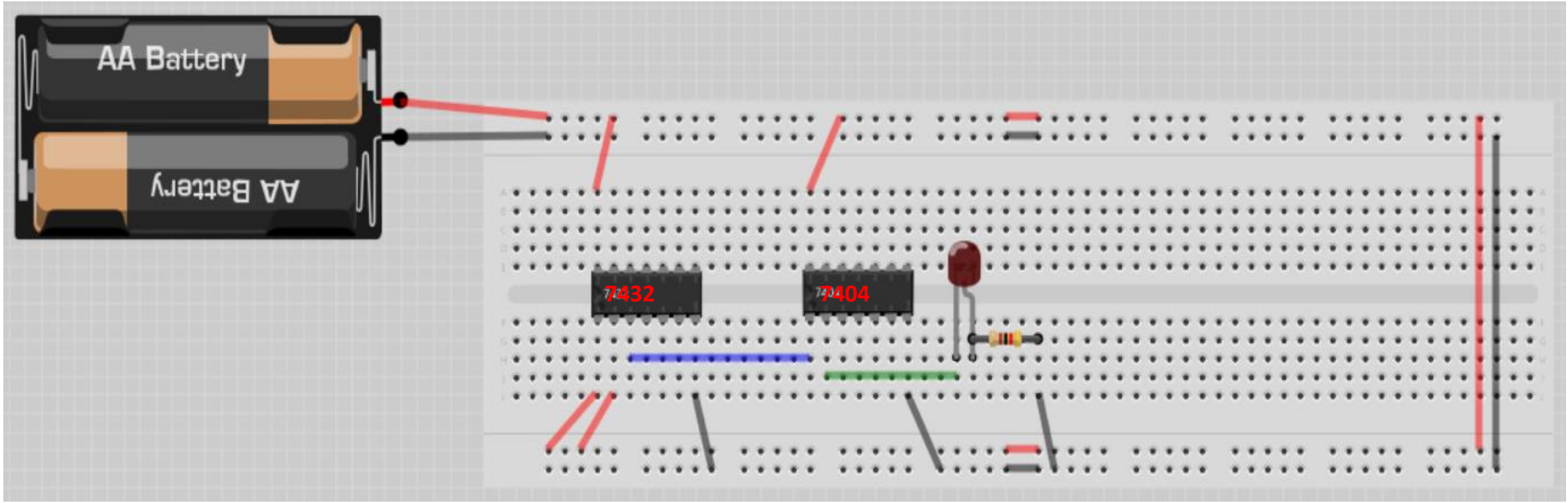


AND Gate Configuration

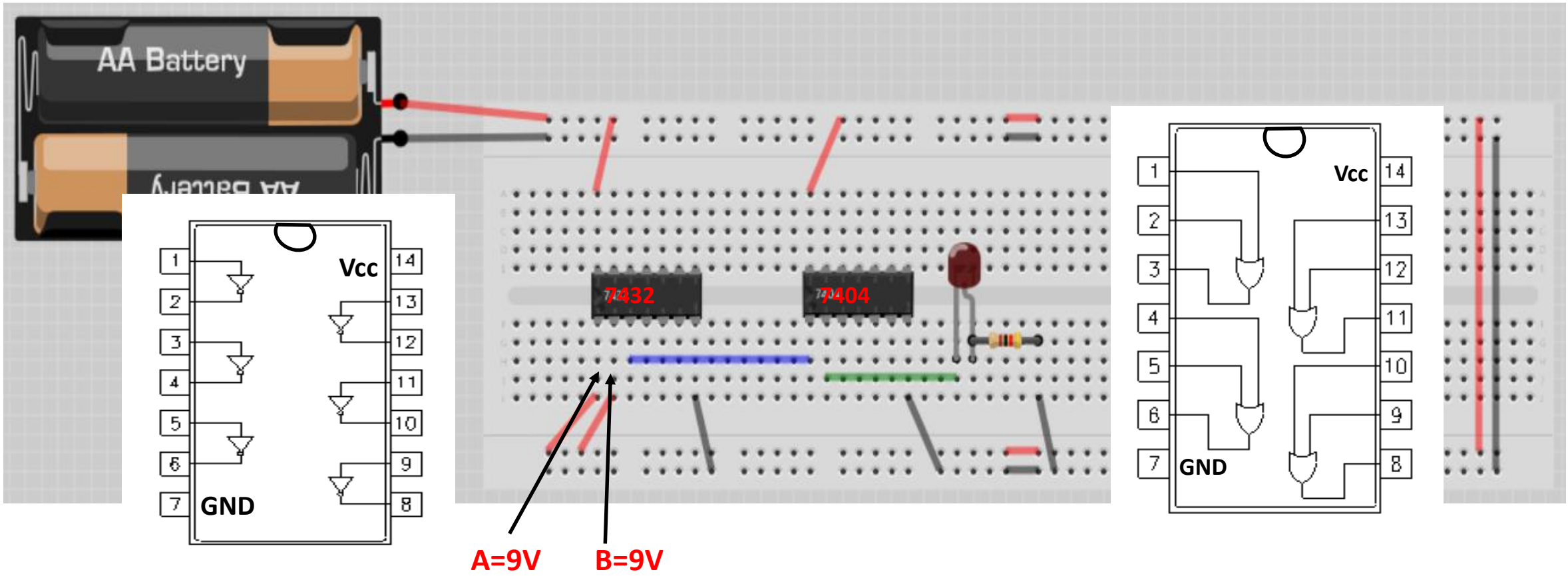


প্রশ্নঃ Implement $\overline{A+B}$ logic function using breadboard.

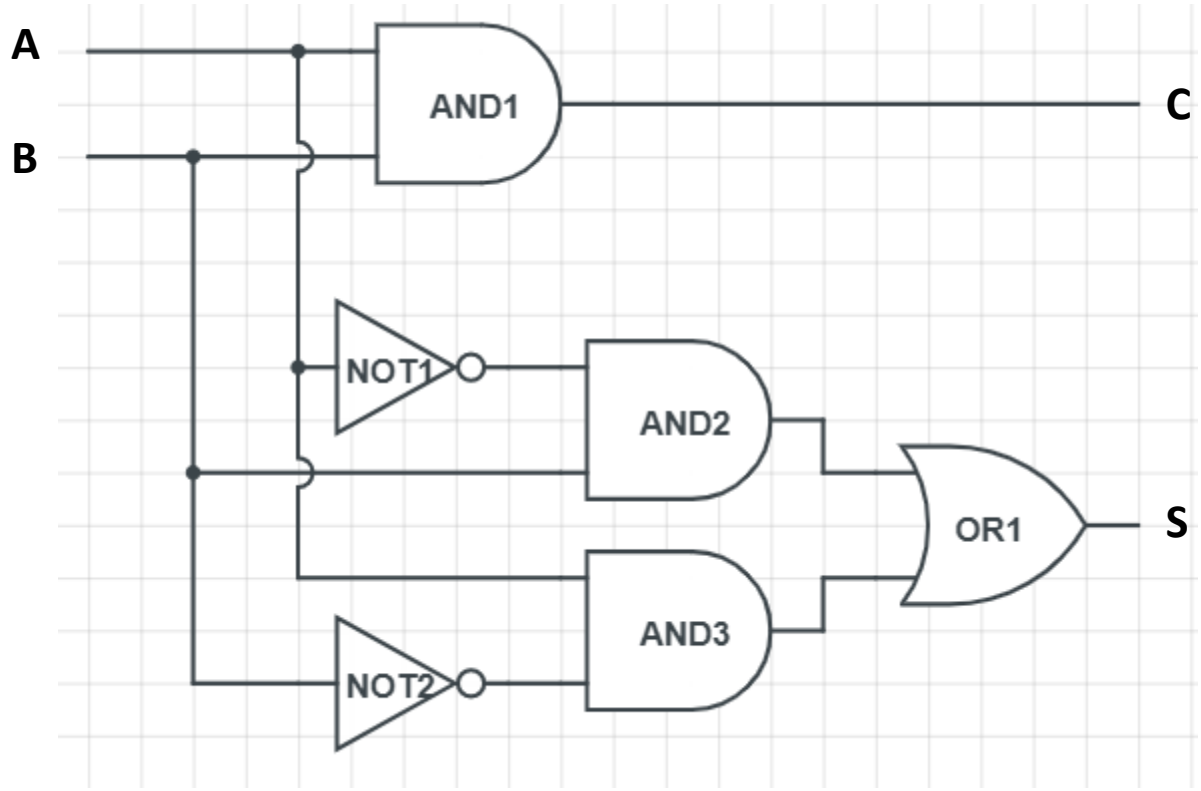
2 input NOR Gate



2 input NOR Gate



Half Adder Circuit



Home work:

Implement:

1. Half adder
2. Half subtractor
3. 2 to 4 Decoder
4. 4 to 2 Encoder
5. 4 to 1 Multiplexer
6. 1 to 4 Demultiplexer

Equipment List:

1. Breadboard – 2 pcs
2. LED – 10 pcs
3. Male to male wire – 40 pcs
4. 9V Battery – 2 pcs
5. Resistor (33ohm/47ohm/1Kohm) – 6pcs
6. 7404 NOT gate/ inverter IC – 2 pcs
7. 7408 AND gate IC – 2 pcs
8. 7432 OR gate IC– 2 pcs

Project Details:

1. Form 6 member group
2. Group members will share equipment cost.
3. Project 1 & 2 will be counted as 1st CT.

Next Day:
Project 2: Digital Electronics using HDL

Summary:

1. Breadboard এ যেকোনো electronics এর কাজ করা হয়।

2. Breadboard এর দুইপাশের Horizontal লাইনগুলো short এবং use করা হয় power supply এর জন্য। এর Vertical লাইনগুলো short এবং use করা হয় electronics prototyping এর জন্য।

4. Breadboard এ Digital Electronics Project এর জন্য **তিনটা** IC use করা হবে। 7404 (NOT Gate), 7432 (OR Gate) & 7408 (AND Gate)। **এদের পিন সংখ্যা 14।**

5. **পৃথিবীর যেকোনো** IC তে VCC এবং GND পিন থাকবেই। কারণ Voltage Difference হলেই Current Flow হবে।

6. যেকোন Output পিনে logic value **বুঝার জন্য একটা** LED **এবং একটা** Resistor লাগাতে হবে।

Thank You ☺