Lab 6: Performing Rate & Operations

Examples and Deliverables

MAE 405, 2025 Spring

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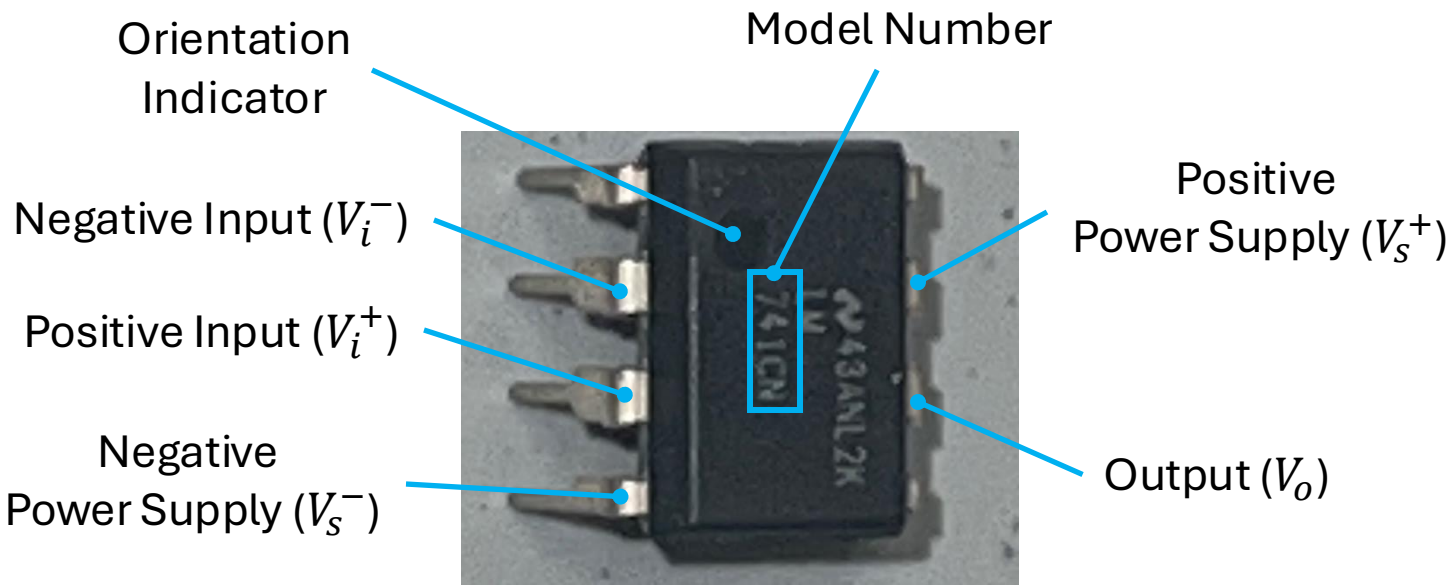
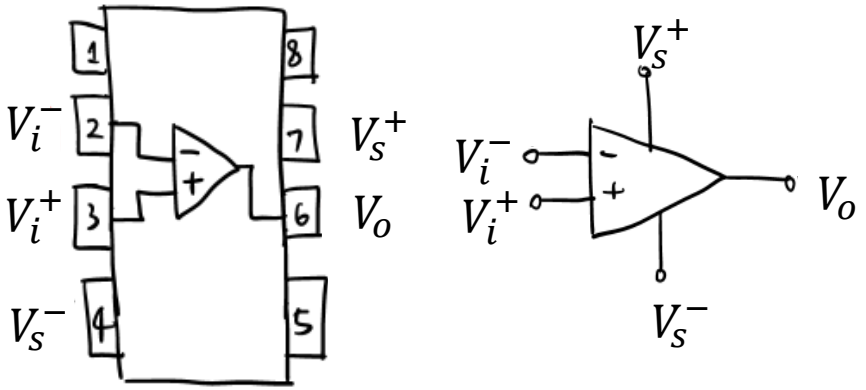
To be prepared with OPAMP

- OPAMP (Operational Amplifier)



OPAMP 741CN



OPAMP Diagram

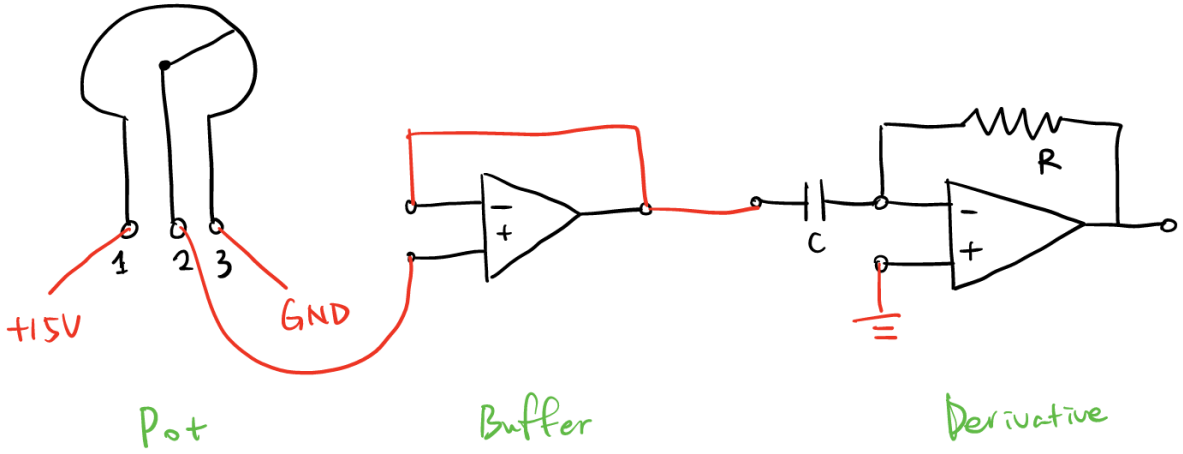
Comments:

- Put the Circle (orientation indicator) at the upper-left corner to align the OPAMP with the diagram
- Identify the Model Number – 741CN
- Always power the OPAMP with V_s^- and V_s^+

Circuits will be used

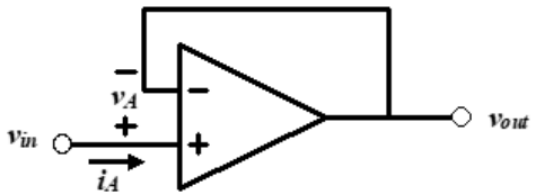
Deliverable
- Photo of the Derivative & Integral Circuits

- Connection diagram for the derivative circuit



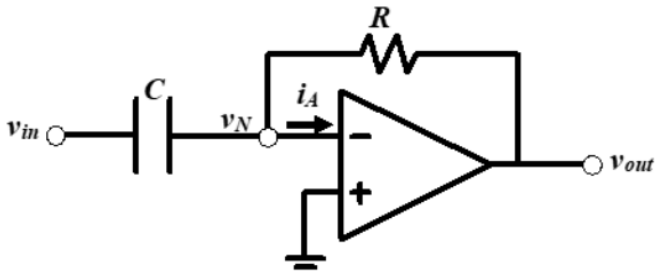
Comment:
- Swap the position of resistor and capacitor to switch between Derivative and Integral Circuit

Buffering (Cascading)



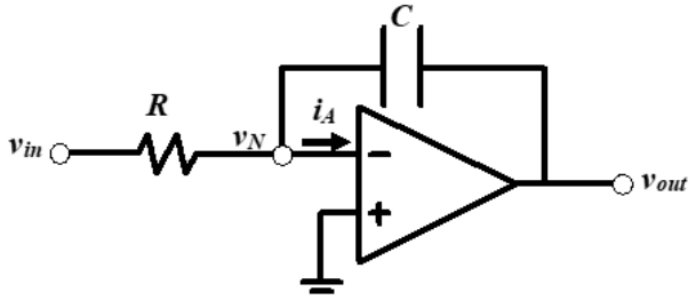
$$v_{out} = v_{in}$$

Rate (Derivative)



$$v_{out} = -(RC)\, rate\{v_{in}\}$$

Area (Integral)



$$v_{out} = -\left(\frac{1}{RC}\right) area\{v_{in}\}$$

Suggestion:
- Always compare the diagram and your circuit connection if anything goes wrong