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Assignment 1: Program Counter (PC)

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Github Repository:

1. Implementing Registers (IR)

b. Program Counter

Purpose:
The Program Counter is a crucial register in the CPU that holds the memory address of the next instruction to be executed. It is automatically incremented after each instruction fetch, ensuring the CPU continues executing instructions in sequence

Designing Explanation:

- **Input Pin:** There are two input pins. Input A (A0, A1, A2, A3), is where the current PC value is being stored into the register. Input B (B0, B1, B2, B3), is the constant binary.

- **Control Pin:** This will ensure that the data can be stored into the register when the PC is ready to store into the register

- **Clock Pin:** This is when it starts the loading process for the data is able to be stored

- **Multiplexer:** The Multiplexer is used to select either one of the inputs that the data can be stored in. In the picture below, it shows that input 0, 1, and 2 are being stored. This can be controlled by clicking on any of the inputs, and selecting the input number that you want to store.

- **D-Flip-Flops:** There are four D-Flip-Flops that are used to store each of the data, in which the clock connects to each flip-flop as well.

- **Output Pin:** The output is able to store whatever data that is being processed to the control unit.

Testing: