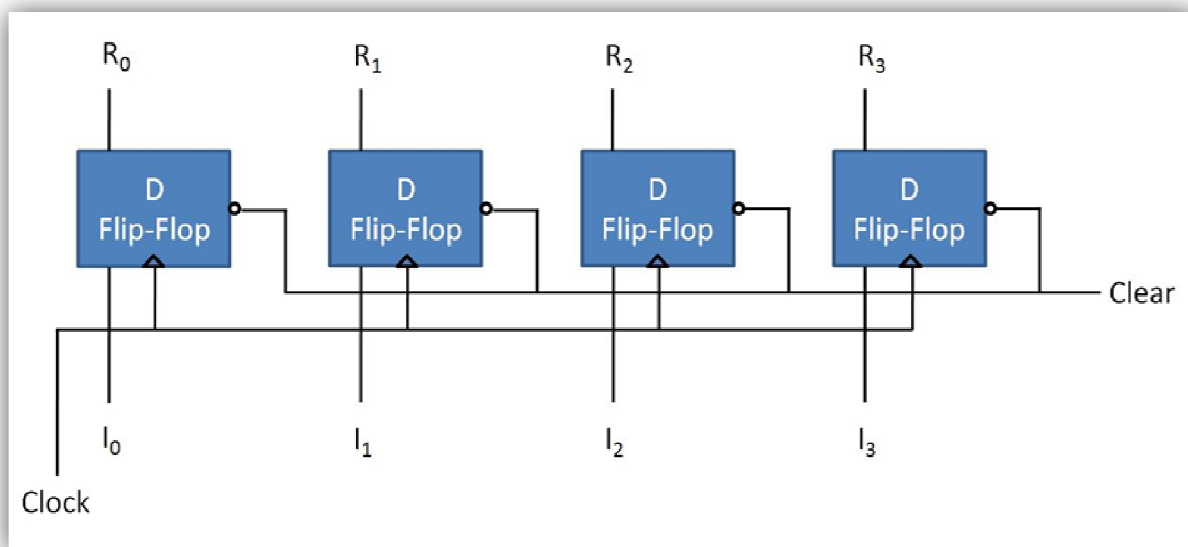


Register: In a computer, a register is one of a small set of data holding places that are part of a computer processor. A register may hold a computer instruction, a storage address, or any kind of data (such as a bit sequence or individual characters). Some instructions specify registers as part of the instruction. For example, an instruction may specify that the contents of two defined registers be added together and then placed in a specified register.

A register must be large enough to hold an instruction - for example, in a 32-bit instruction computer; a register must be 32 bits in length. In some computer designs, there are smaller registers - for example, half-registers - for shorter instructions. Depending on the processor design and language rules, registers may be numbered or have arbitrary names.

A 4-bit Register: A 4-bit register is basically a combination of 4 different Flip-Flops that can store 4 bits in each of its Flip-Flop discretely. Every Flip-Flop gets discrete input and hence provides discrete output. Clock input is provided concurrently to every Flip-Flop. Thus when clock pulse becomes high, every Flip-Flop gets activated instantly.



Here in this diagram, we see that I₀, I₁, I₂ and I₃ are the four discrete inputs to every flip flop. Similarly, R₀, R₁, R₂ and R₃ are the three discrete outputs of the flip flops.

Shift Registers: The Shift Register is another type of sequential logic circuit that can be used for the storage or the transfer of data in the form of binary numbers. This sequential device loads the data present on its inputs and then moves or "shifts" it to its output once every clock cycle, hence the name "shift register".

A shift register basically consists of several single bits "D Flip Flops", one for each data bit, (either logic "0" or "1") connected together in a serial or parallel type arrangement.

Shift Registers are categorized normally in the following four types:

1. Serial In – Serial Out Shift Registers
2. Serial In – Parallel Out Shift Registers
3. Parallel In – Serial Out Shift Registers
4. Parallel In – Parallel Out Shift Registers

Assignments:

1. What is a Register? Why do we need it?
2. What is a shift register?