

# Registers

## Lecture 29

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1 Registers

2 Building an 8-bit Register

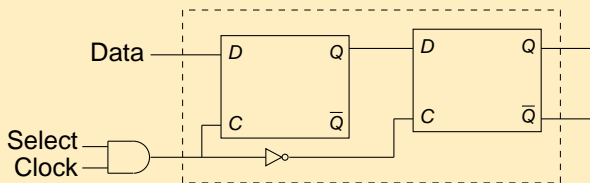
3 Assignment

# Outline

- 1 Registers
- 2 Building an 8-bit Register
- 3 Assignment

# A Register

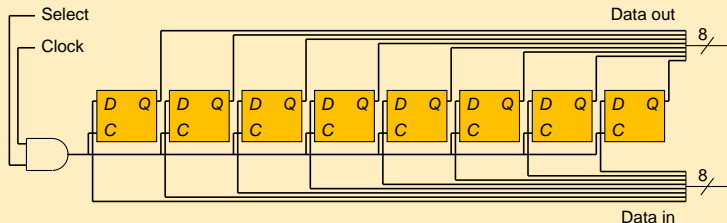
## Storing a Bit



- Recall the D flip flop, in which the data will be stored on the rising edge of the clock.
- However, we need to indicate whether the value *should* be stored.
- The “select” signal does that.

# An 8-bit Register

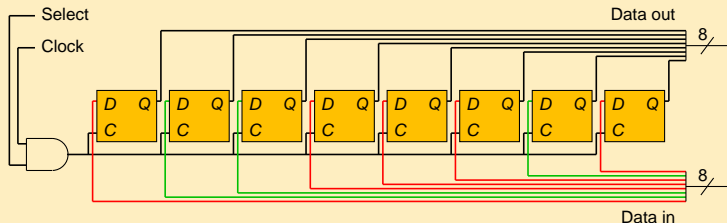
## Storing a Byte



An 8-bit register

# An 8-bit Register

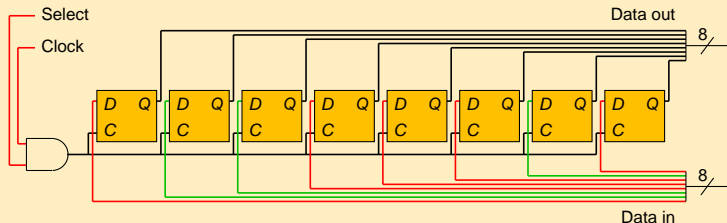
## Storing a Byte



Data in = 10011101 (red = 1, green = 0)

# An 8-bit Register

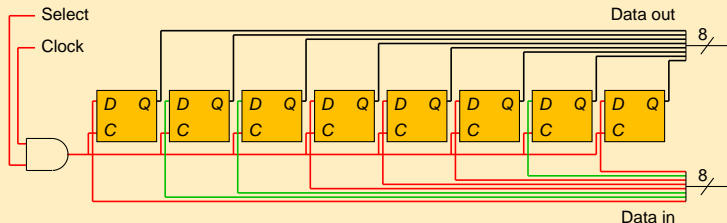
## Storing a Byte



Rising edge of Clock and Select is on

# An 8-bit Register

## Storing a Byte

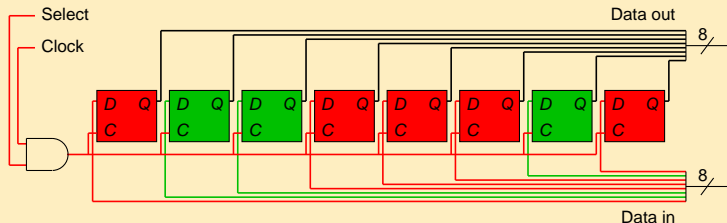


AND-gate allows rising edge to open latches



# An 8-bit Register

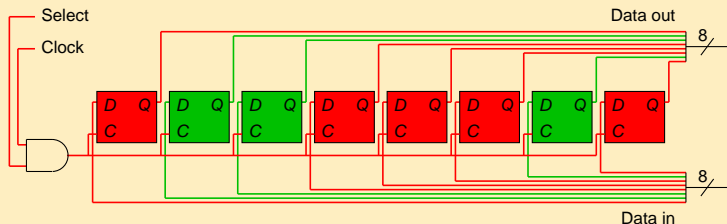
## Storing a Byte



Data are stored in flip flops

# An 8-bit Register

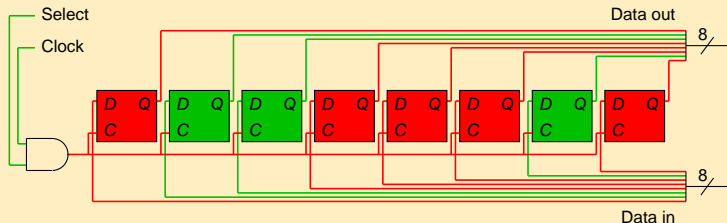
## Storing a Byte



Data become readable

# An 8-bit Register

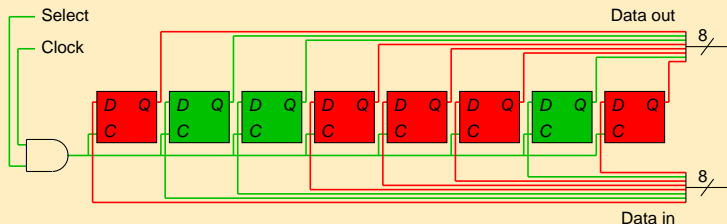
## Storing a Byte



Falling edge of Clock and Select is off

# An 8-bit Register

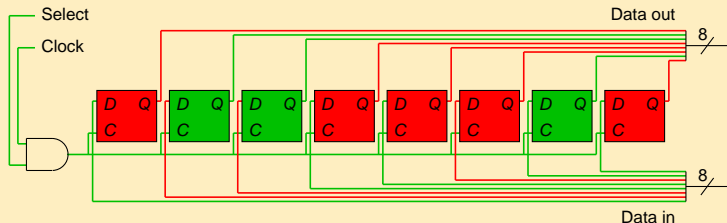
## Storing a Byte



AND-gate allows falling edge to reach each flip flop

# An 8-bit Register

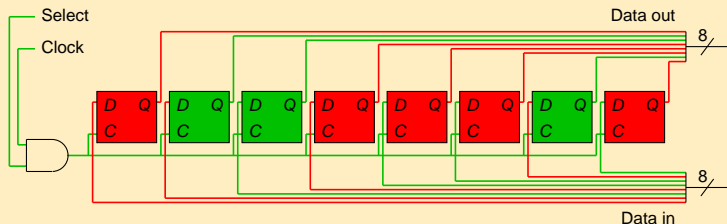
## Storing a Byte



Data in = 01100100

# An 8-bit Register

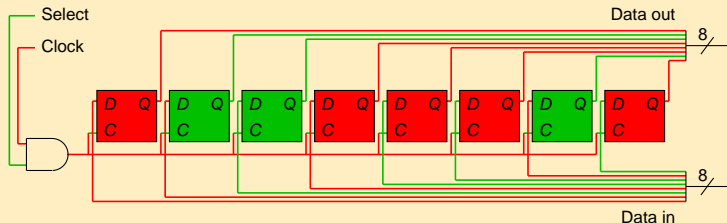
## Storing a Byte



Data in = 11010010

# An 8-bit Register

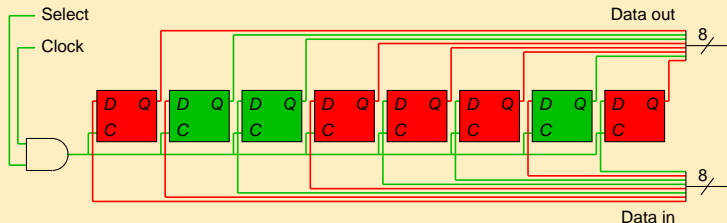
## Storing a Byte



Rising edge of Clock with Select off (latches closed)

# An 8-bit Register

## Storing a Byte



Falling edge of Clock with Select off (latches closed)



# Outline

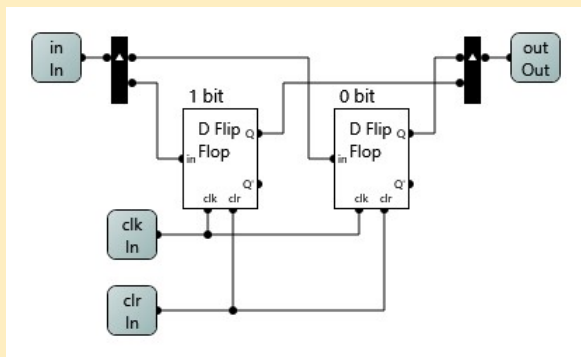
1 Registers

**2 Building an 8-bit Register**

3 Assignment

# Building an 8-bit Register

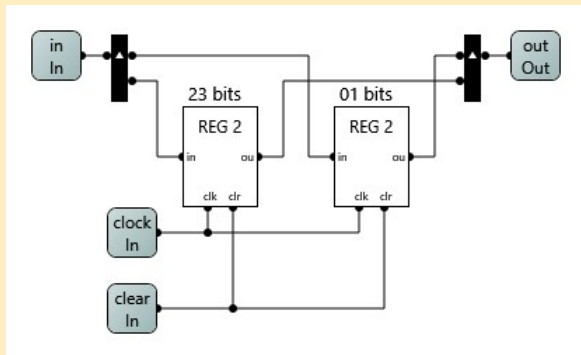
## Building an 8-bit Register



Build a 2-bit register from two flip flops (1-bit registers).

# Building an 8-bit Register

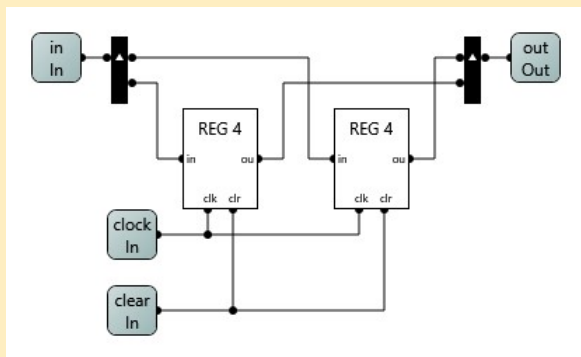
## Building an 8-bit Register



Build a 4-bit register from two 2-bit registers.

# Building an 8-bit Register

## Building an 8-bit Register



Build an 8-bit register from two 4-bit registers.

# Outline

1 Registers

2 Building an 8-bit Register

**3 Assignment**

# Assignment

## Assignment

- Assignment 14.