# Flip flops

master - slave flip flop :-
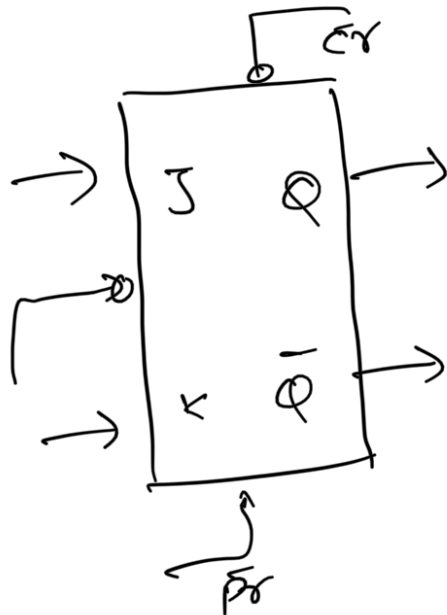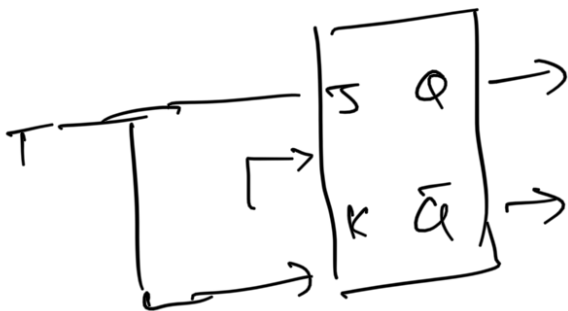


| J K | $Q_{n+1}$ |
|-----|-----------|
| 0 0 | $Q_n$ |
| 0 1 | 0 |
| 1 0 | 1 |
| 1 1 | $\overline{Q_n}$ |

Toggle
(asynchronous ckt)

### T-Flip flop :
we get T-flf by making J=K



| T | $Q_{n+1}$ |
|---|-----------|
| 0 | $Q_n$ |
| 1 | $\overline{Q_n}$ |

can be used as frequency divider

### D- Flip-flop
Delay F/F

ne get T-flp by _____

| D | $Q_{nt\,1}$ |
|---|---|
| 0 | D |
| 1 | D |

This is used to synchronous two signals



$S_1$ (faster) ——————— [F/F] ——— $S_1'$

$S_2$ (slower ————————————— $S_2'$

( assume at same time )
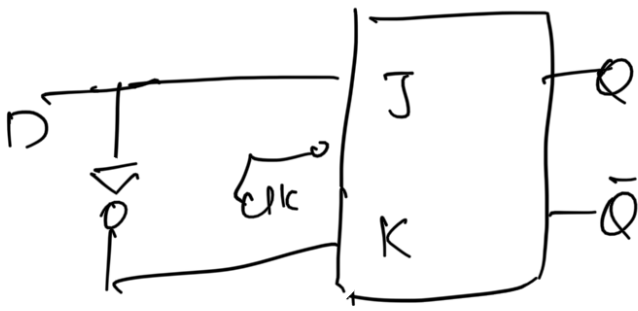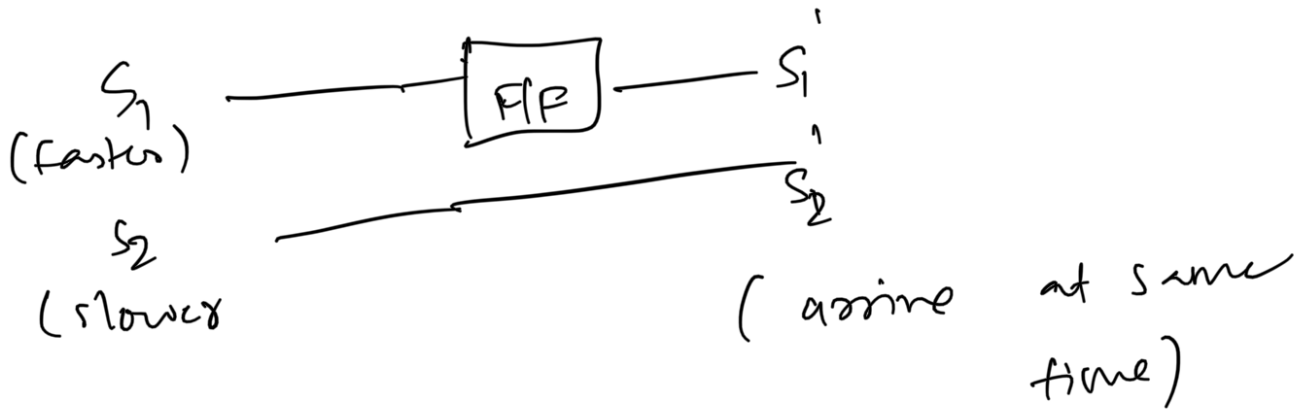
⟶ Used in shift registers

F/F are edge triggered

Latches are level triggered