6.1 Flip-flop Characteristic Tables

- Each type of flip-flop has its own behaviour, shown by its characteristic table.

J	*K*	*Q(t+1)*	Comments
0	0	*Q(t)*	No change
0	1	0	Reset
1	0	1	Set
1	1	*Q(t)'*	Toggle

S	*R*	*Q(t+1)*	Comments
0	0	*Q(t)*	No change
0	1	0	Reset
1	0	1	Set
1	1	?	Unpredictable

D	*Q(t+1)*	
0	0	Reset
1	1	Set

T	*Q(t+1)*	
0	*Q(t)*	No change
1	*Q(t)'*	Toggle

6.3 Flip-flop Excitation Tables (1/2)

- *Excitation tables*: given the required transition from present state to next state, determine the flip-flop input(s).

Q	Q^+	J	K
0	0	0	X
0	1	1	X
1	0	X	1
1	1	X	0

JK Flip-flop

Q	Q^+	S	R
0	0	0	X
0	1	1	0
1	0	0	1
1	1	X	0

SR Flip-flop

Q	Q^+	D
0	0	0
0	1	1
1	0	0
1	1	1

D Flip-flop

Q	Q^+	T
0	0	0
0	1	1
1	0	1
1	1	0

T Flip-flop