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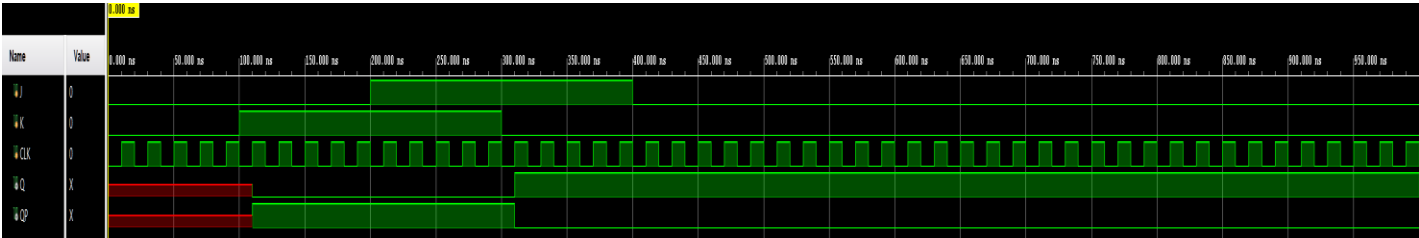
Timing Chart

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Lab7.v

```verilog
`timescale 1ns / 1ps

module JK_Flip_Flop( CLK, J, K, Q, QP );

    input CLK,J,K;
    output reg Q, QP;

    always @ ( posedge CLK ) begin

        if ( J == K ) begin
        end

        else if ( J == 1 ) begin
            Q <= 1;
            QP <= 0;
        end

        else if ( K == 1 ) begin
            Q <= 0;
            QP <= 1;
        end

    end

endmodule
```

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Lab7_tb.v

```verilog
`timescale 1ns / 1ps

module Lab7_tb();

    reg J,K, CLK;
    wire Q, QP;

    JK_Flip_Flop jkff( CLK, J, K, Q, QP );

    initial begin

        CLK = 1'b0;
        forever begin
            #10;
            CLK = ~CLK;
        end

    end

    initial begin

        J = 0; K = 0;
        $monitor( "simtime = %g, CLK = %b, J = %b, K = %b, Q = %b, QBAR = %b", $time, CLK, J, K, Q, QP );

        #100; J = 0; K = 1;
        $monitor( "simtime = %g, CLK = %b, J = %b, K = %b, Q = %b, QBAR = %b", $time, CLK, J, K, Q, QP );

        #100; J = 1; K = 1;
        $monitor( "simtime = %g, CLK = %b, J = %b, K = %b, Q = %b, QBAR = %b", $time, CLK, J, K, Q, QP );

        #100; J = 1; K = 0;
        $monitor( "simtime = %g, CLK = %b, J = %b, K = %b, Q = %b, QBAR = %b", $time, CLK, J, K, Q, QP );

        #100; J = 0; K = 0;
        $monitor( "simtime = %g, CLK = %b, J = %b, K = %b, Q = %b, QBAR = %b", $time, CLK, J, K, Q, QP );

    end

endmodule
```

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TCL Console

simtime = 0, CLK = 0, J = 0, K = 0, Q = x, QBAR = x

simtime = 10, CLK = 1, J = 0, K = 0, Q = x, QBAR = x

simtime = 20, CLK = 0, J = 0, K = 0, Q = x, QBAR = x

simtime = 30, CLK = 1, J = 0, K = 0, Q = x, QBAR = x

simtime = 40, CLK = 0, J = 0, K = 0, Q = x, QBAR = x

simtime = 50, CLK = 1, J = 0, K = 0, Q = x, QBAR = x

simtime = 60, CLK = 0, J = 0, K = 0, Q = x, QBAR = x

simtime = 70, CLK = 1, J = 0, K = 0, Q = x, QBAR = x

simtime = 80, CLK = 0, J = 0, K = 0, Q = x, QBAR = x

simtime = 90, CLK = 1, J = 0, K = 0, Q = x, QBAR = x

simtime = 100, CLK = 0, J = 0, K = 1, Q = x, QBAR = x

simtime = 100, CLK = 0, J = 0, K = 1, Q = x, QBAR = x

simtime = 110, CLK = 1, J = 0, K = 1, Q = 0, QBAR = 1

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simtime = 120, CLK = 0, J = 0, K = 1, Q = 0, QBAR = 1

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simtime = 130, CLK = 1, J = 0, K = 1, Q = 0, QBAR = 1

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simtime = 150, CLK = 1, J = 0, K = 1, Q = 0, QBAR = 1

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simtime = 160, CLK = 0, J = 0, K = 1, Q = 0, QBAR = 1

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simtime = 170, CLK = 1, J = 0, K = 1, Q = 0, QBAR = 1

simtime = 180, CLK = 0, J = 0, K = 1, Q = 0, QBAR = 1

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simtime = 190, CLK = 1, J = 0, K = 1, Q = 0, QBAR = 1

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