VisionForge: Assignment 2

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Due date: 22 Dec, 2023
Due time: 11:59 PM

Exploring K-Maps and Circuits

1. Cracking the Binary Code

Picture yourself as a Digital Detective, ready to solve the mystery of a single-output digital system. Your task is to crack the binary code that triggers a logic-1 for numbers 2, 7, or 15 and a logic-0 for numbers 0, 1, 4, 5, 6, 9, 10, 13, or 14. The elusive numbers 3, 8, 11, and 12 never seem to make an appearance in this digital puzzle.

Your Challenge:

Become the Digital Detective and decode the binary puzzle. Your mission is to unveil the secret code that generates a logic-1 and a logic-0. For a logic-1, create the simplest combination of inputs using the minimum **SOP** form, and for a logic-0, uncover the binary dance steps in the minimum **POS** form. Your journey into the binary puzzle adventure begins now!

2. Cybercraft Challenge - Crypto Lock

J	K	Q
0	0	Qold
0	1	0
1	0	1
1	1	~Qold

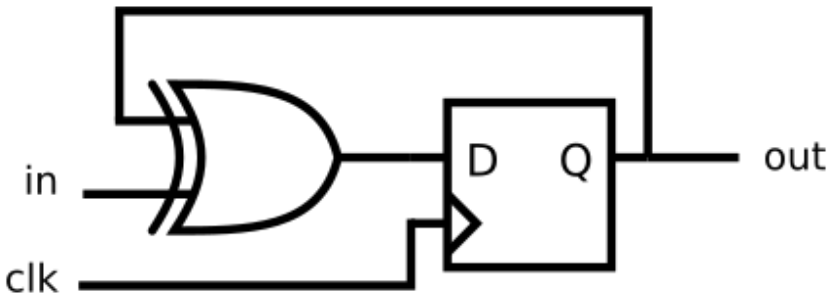
Dive into the Cybercraft Challenge with the Crypto Lock mission! Your task is to create a digital safe (JK flip-flop) using a D-type flip-flop and gates. Follow the coded instructions in the truth table as shown.

Module Declaration

```
module top_module (
    input clk,
    input j,
    input k,
    output Q);
```

Design a robust digital lock, ensuring the safe responds accurately to the coded instructions. Let the Cybercraft Adventure unfold, turning digital signals into a secure sanctuary!

3. CodeCraft Challenge



Dive into the CodeCraft Challenge as a Verilog Artist! Your task is to infuse life into a circuit, envisioning every gate and wire as a stroke on your digital canvas. Craft a concise Verilog code that transforms this circuit into a captivating visual symphony, letting your coding artistry shine through in this unique CodeCraft adventure!

- *Note - Run your codes on VS Code and test them using the testbench file. You have to submit both the module file and the testbench file.*