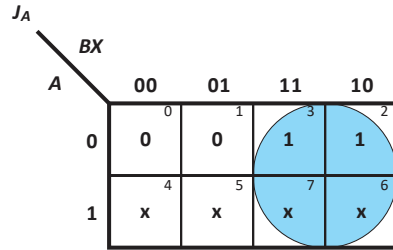
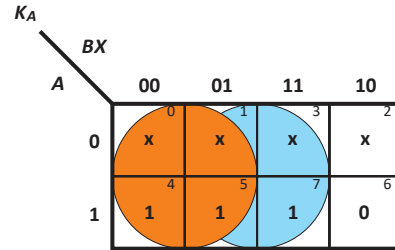


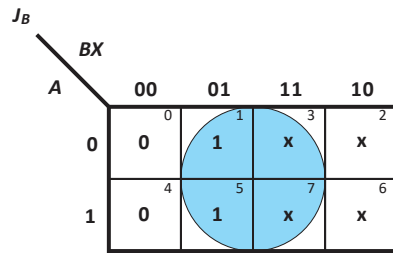
Recall the Next State Decoder.



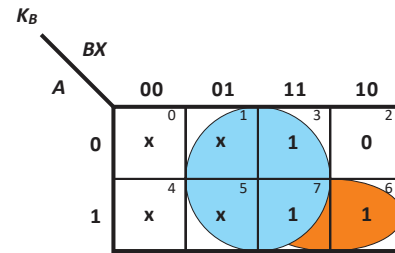
$$J_A = B$$



$$K_A = \overline{B} + X$$



$$J_B = X$$



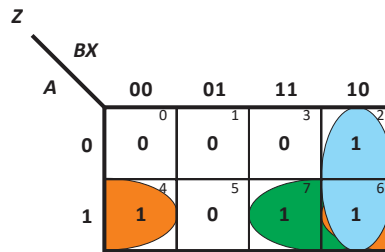
$$K_B = X + AB$$

Count the cost: 3 2-input gates  
Choose the JK Flip-Flop implementation  
Add the output decoder.

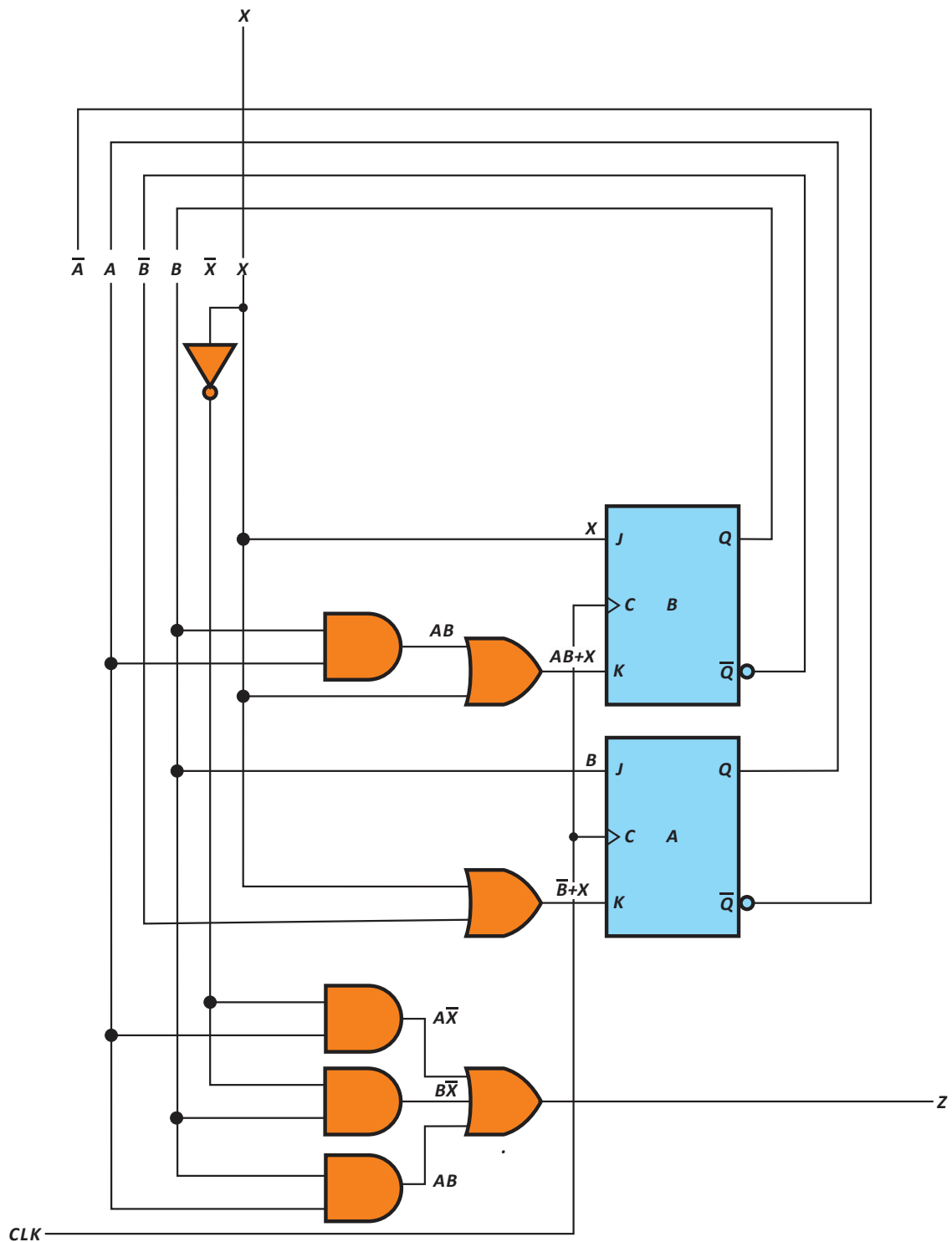
Recall the Present-State-Next-State Table constructed in Step 2.

| Present State |          | Input<br><i>X</i> |  | Next State |          | Output<br><i>Z</i> |
|---------------|----------|-------------------|--|------------|----------|--------------------|
| <i>A</i>      | <i>B</i> |                   |  | <i>A</i>   | <i>B</i> |                    |
| 0             | 0        | 0                 |  | 0          | 0        | 0                  |
|               | 0        | 1                 |  | 1          | 0        | 0                  |
| 1             | 0        | 0                 |  | 3          | 1        | 1                  |
|               | 0        | 1                 |  | 2          | 1        | 0                  |
| 2             | 1        | 0                 |  | 0          | 0        | 1                  |
|               | 1        | 0                 |  | 1          | 0        | 0                  |
| 3             | 1        | 1                 |  | 2          | 1        | 1                  |
|               | 1        | 1                 |  | 0          | 0        | 1                  |

Present-State-Next-State Table



$$Z = \overline{A}\overline{X} + \overline{B}\overline{X} + \overline{A}B +$$



Logic Diagram