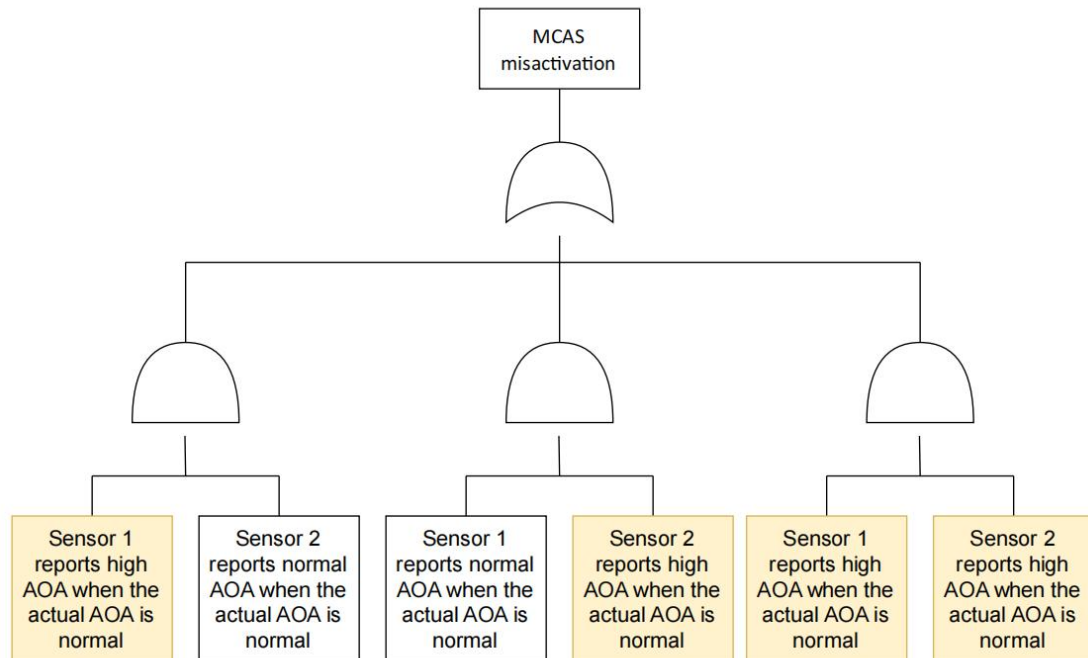


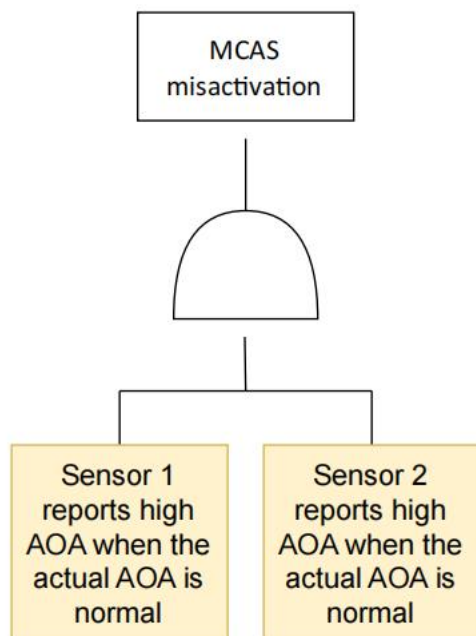
Answer Sheet: Risk Management Part

MCAS mis-activation on the faulty design



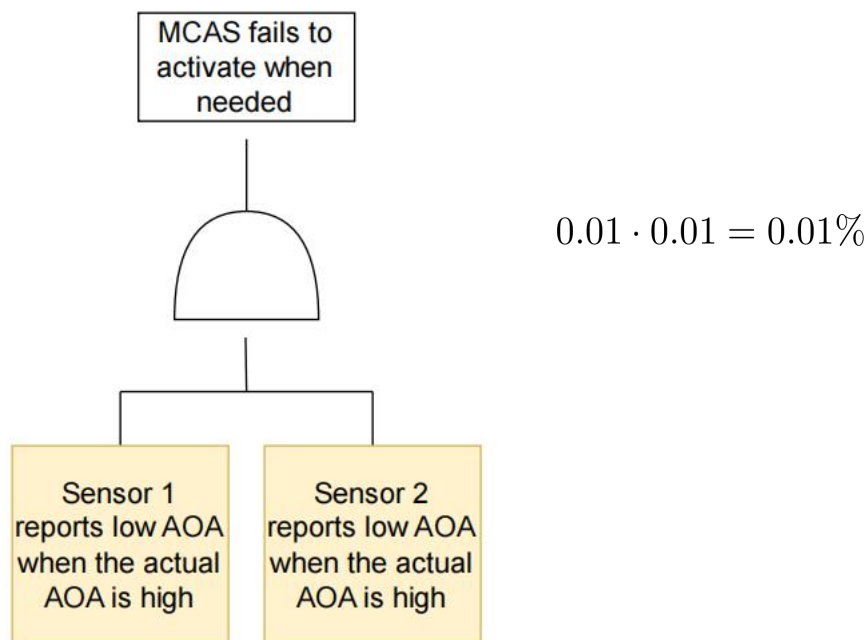
$$0.01 \cdot 0.98 + 0.01 \cdot 0.98 + 0.01 \cdot 0.01 = 1.97\%$$

MCAS mis-activation on Aggressive Design

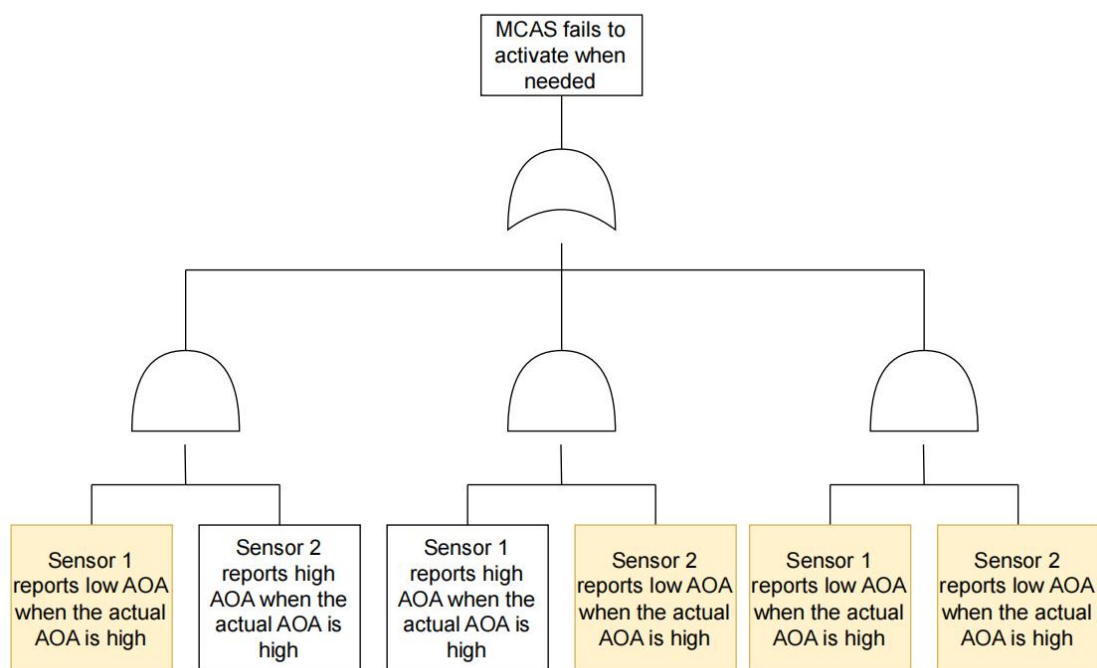


$$0.01 \cdot 0.01 = 0.01\%$$

MCAS fails to activate when needed on the faulty design

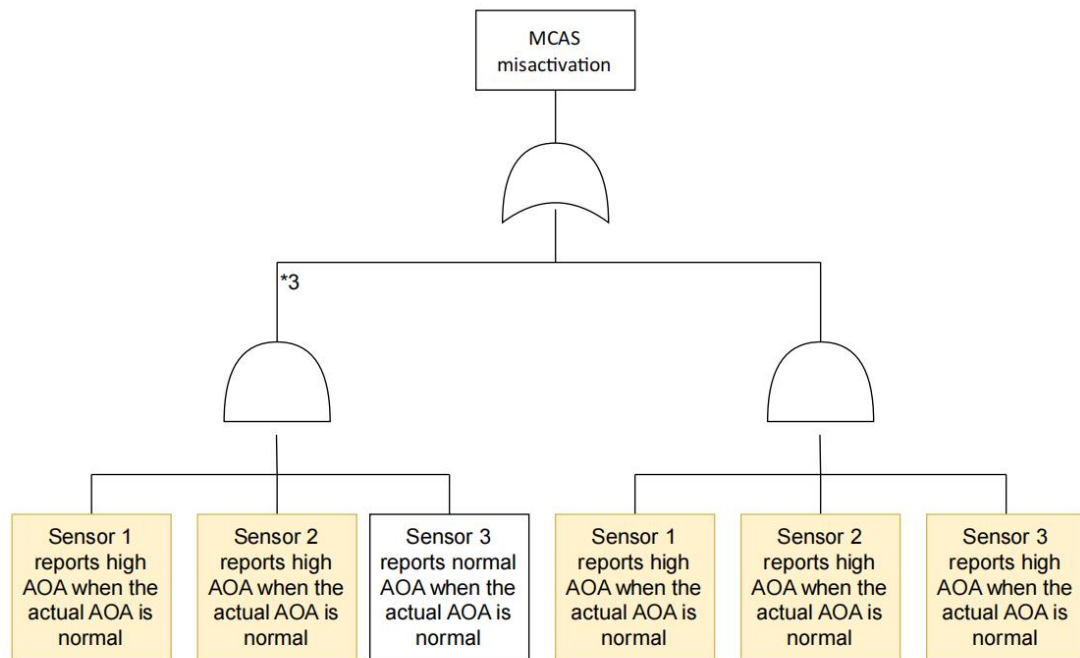


MCAS fails to activate when needed on Aggressive Design



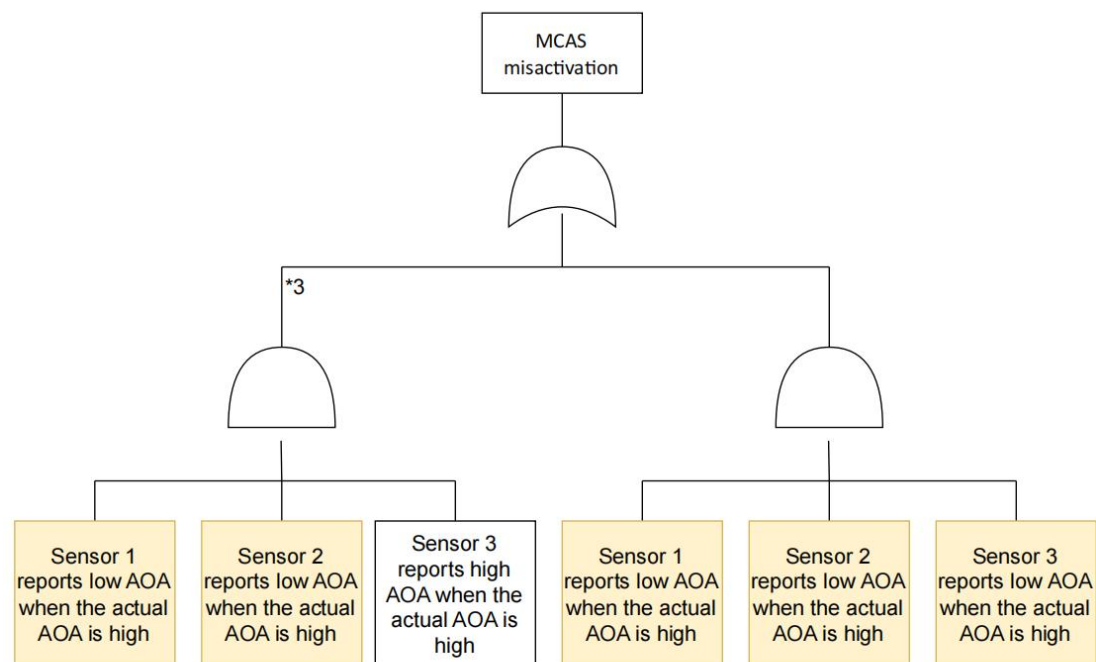
$$0.01 \cdot 0.98 + 0.01 \cdot 0.98 + 0.01 \cdot 0.01 = 1.97\%$$

MCAS mis-activation on the 2/3 design



$$(0.01 \cdot 0.01 \cdot 0.98) \cdot 3 + 0.01 \cdot 0.01 \cdot 0.01 = 0.0295\%$$

MCAS fails to activate when needed on 2/3 Design



$$(0.01 \cdot 0.01 \cdot 0.98) \cdot 3 + 0.01 \cdot 0.01 \cdot 0.01 = 0.0295\%$$

2/3 design is an overall better design because it both reduces the probability of mis-activation and activation failure below 1.00%.

Compared to faulty design, 2/3 design does not increase the probability of activation failure very much but sharply decrease the probability of mis-activation.

Compared to aggressive design, 2/3 design does not increase the probability of mis-activation. very much but sharply decrease the probability of activation failure.

| | Faulty | Aggressive | 2/3 |
|------------------------------------|--------|------------|---------|
| MCAS mis-activation | 1.97% | 0.01% | 0.0295% |
| MCAS fails to activate when needed | 0.01% | 1.97% | 0.0295% |

Answer Sheet: UPPAAL Part

Required files: greedy.xml, greedy.xtr, polite.xml, and polite.xtr (if necessary)

1-a:

knife1_fork1: there is 1 knife and 1 fork on the table

knife0_fork1: there is no knife and 1 fork on the table

knife1_fork0 : there is 1 knife and no fork on the table

knife0_fork0: there is no knife and no fork on the table

1-b:

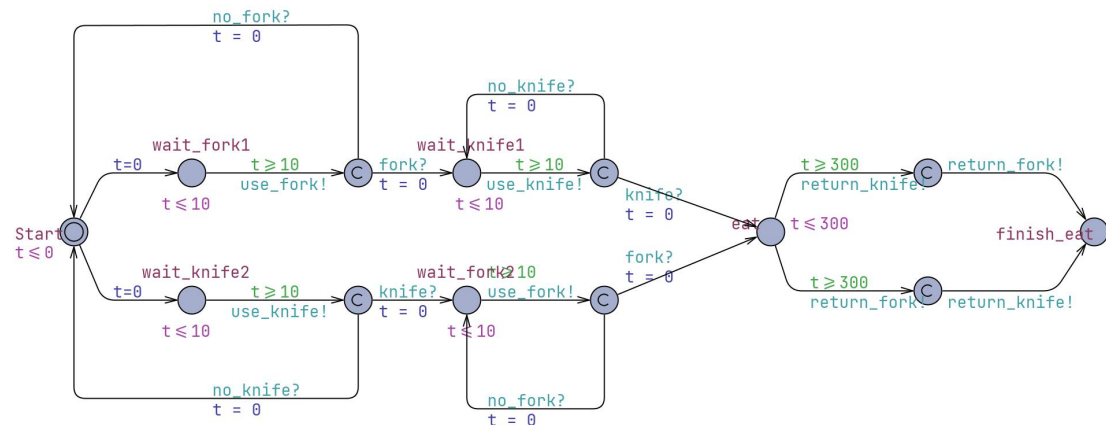
knife0_fork1

1-c:

knife0_fork0

2-a: Model File: greedy.xml

paste the picture of your template of greedy customer here



2-b:

Query:

$A[] \text{ gclk} > 700 \text{ imply GreedyCustomer1.finish_eat or GreedyCustomer2.finish_eat}$

Validation Result:

Property is not satisfied.

Counter Example (Trace File): greedy.xtr

3-a: Model File: polite.xml

paste the picture of your template of polite customer here

