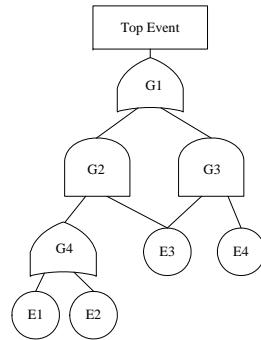




## I-E Method - Solution



$$C_1 = \{E1, E3\}, C_2 = \{E2, E3\}, C_3 = \{E3, E4\}$$

$$\Pr(E1)=0.1, \Pr(E2)=0.05, \Pr(E3)=0.01, \Pr(E4)=0.02$$

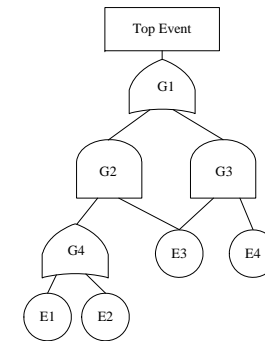
$$\Pr(C_1) = \Pr(E1)\Pr(E3) = 0.001, \Pr(C_2) = \Pr(E2)\Pr(E3) = 0.0005$$

$$\Pr(C_3) = \Pr(E3)\Pr(E4) = 0.0002 \quad \text{-- MC Failure Probabilities}$$

$$\begin{aligned} Q_{\text{sys}} &= \Pr\{C_1 \cup C_2 \cup C_3\} = \sum_{i=1}^3 \Pr(C_i) - \sum_{i < j} \Pr(C_i \cap C_j) + \Pr(C_1 \cap C_2 \cap C_3) \\ &= \sum_{i=1}^3 \Pr(C_i) - \Pr(C_1 \cap C_2) - \Pr(C_1 \cap C_3) - \Pr(C_2 \cap C_3) + \Pr(C_1 \cap C_2 \cap C_3) \\ &= 0.0017 - \Pr(E1E2E3) - \Pr(E1E3E4) - \Pr(E2E3E4) + \Pr(E1E2E3E4) \\ &= 0.0017 - 0.00005 - 0.00002 - 0.00001 + 0.000001 \\ &= 0.001621 \end{aligned}$$

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## SDP Method - Solution



$$C_1 = \{E1, E3\}, C_2 = \{E2, E3\}, C_3 = \{E3, E4\}$$

$$\Pr(E1)=0.1, \Pr(E2)=0.05, \Pr(E3)=0.01, \Pr(E4)=0.02$$

$$\Pr(C_1) = 0.001, \Pr(C_2) = 0.0005, \Pr(C_3) = 0.0002$$

$$\begin{aligned} Q_{\text{sys}} &= \Pr(C_1) + \Pr(\overline{C_1}C_2) + \Pr(\overline{C_1}\overline{C_2}C_3) \\ &= P(E1)P(E3) + \Pr(\overline{E1}E3E2E3) + \Pr(\overline{E1}E3\overline{E2}E3E4) \\ &= 0.001 + \Pr((\overline{E1} + \overline{E3})E2E3) + \Pr((\overline{E1} + \overline{E3})(\overline{E2} + \overline{E3})E3E4) \\ &= 0.001 + \Pr(\overline{E1}E2E3) + \Pr(\overline{E1}\overline{E2}E3E4) \\ &= 0.001 + 0.9 * 0.05 * 0.01 + 0.9 * 0.95 * 0.01 * 0.02 \\ &= 0.001621 \end{aligned}$$

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