

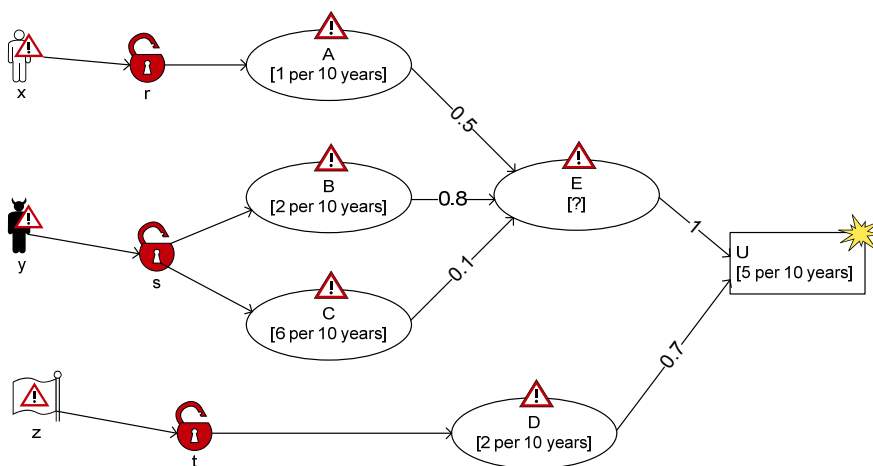


## Solution to exercises

31 October, 2008



## Exercise 1, I – find minimum likelihood of E



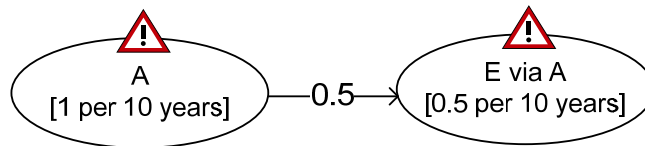


### Exercise 1 – E via A:

- If the vertices  $v_1$  and  $v_2$  are related by leads-to, we have:

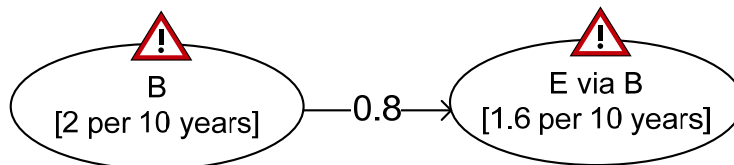
$$\frac{v_1(f) \quad v_1 \xrightarrow{l} v_2}{(v_1 \sqcap v_2)(f \cdot l)}$$

- 1 per 10 years  $\times$  0.5 = 0.5 per 10 years

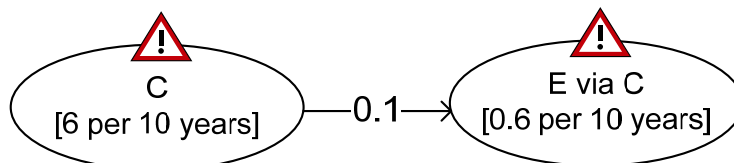


### E via B and C

- 2 per 10 years  $\times$  0.8 = 1.6 per 10 years



- 6 per 10 years  $\times$  0.1 = 0.6 per 10 years



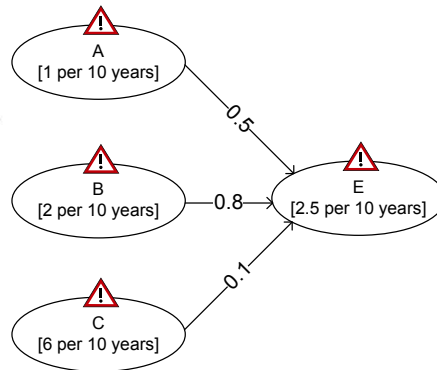


### What is the minimum likelihood of E?

- If the vertices  $v_1$  and  $v_2$  are statistically independent, we have:

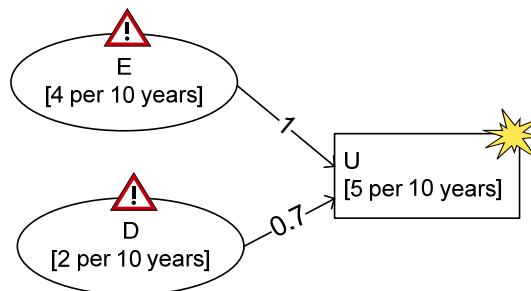
$$\frac{v_1(f_1) \cdot v_2(f_2)}{(v_1 \sqcup v_2)(f_1 + f_2 - f_1 \cdot f_2)}$$

- Equivalent to:  $1 - ((1 - f_1) \times (1 - f_2))$
- $1 - ((1 - 0.5/10) \times (1 - 1.6/10) \times (1 - 0.6/10)) = 2.5/10$



### Exercise 2 – consistency check

- $1 - ((1 - 4/10) \times (1 - 1.4/10)) \approx 4.8/10$
- $4.8 < 5$



- the assignment of 4 per 10 years to E is consistent with the likelihood assigned to U





## Exercise 2, 1b -- risk value matrix

| Consequence | Likelihood |           |        |
|-------------|------------|-----------|--------|
|             | Seldom     | Sometimes | Often  |
| Minor       | Low        | Low       | Medium |
| Moderate    | Low        | Medium    | High   |
| Major       | Medium     | High      | High   |

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## Risk evaluation criteria and risks

| Asset                          | Max accepted risk level |
|--------------------------------|-------------------------|
| CM1 Users personal information | low risk                |
| CM2 Company reputation         | medium risk             |
| CM3 Availability of service    | medium risk             |
| CM4 User efficiency            | high risk               |

| Risks  | Asset harmed | Consequence estimate | Likelihood estimate | Risk value |
|--|--------------|----------------------|---------------------|------------|
| R2CM) Unauthorized modification of user's personal information | CM1          | Major                | Seldom              | Medium     |
| R4CM) Unavailability of service due to infrastructure failure  | CM3          | Moderate             | Sometimes           | Medium     |
| R5CM) Unavailability of service due to malicious code          | CM3          | Moderate             | Seldom              | Low        |
| R6CM) Damage to company reputation                             | CM2          | Moderate             | Seldom              | Low        |
| R7CM) Reduced user efficiency                                  | CM4          | Minor                | Sometimes           | Low        |

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## Exercise 2, III b – risk evaluation matrix

| Consequence | Likelihood |           |       |
|-------------|------------|-----------|-------|
|             | Seldom     | Sometimes | Often |
| Minor       |            | R7CM      |       |
| Moderate    | R5CM, R6CM | R4CM      |       |
| Major       | R2CM       |           |       |

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