# Assignment 4

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# 1 Reliability

We assume that $p$ is the probability of failure over some amount of time and we are computing the probability of the system being connected after one such amount of time.

1. The system will become disconnected if one of the two wires fail. That means the failure probability is $Pr(X \leq 0)$, where $X$ $binom(2, p)$.
2. In this case, the system will become disconnected if two of the three links fail, so the failure probability is $Pr(Y \leq 1)$ where $Y$ $binom(3, p)$.
3. We compute the two probabilities:

$$Pr(X \leq 0) = \binom{2}{0} 0.000001^0 (1 - 0.000001)^2 \approx 0.99999800$$

$$Pr(X \leq 1) = \sum_{i=0}^{1} \binom{3}{i} 0.0001^i (1 - 0.0001)^{(3-i)} \approx 0.99999997$$


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