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2. A department supervisor is considering purchasing one of two comparable photocopy machines, A or B. Machine A costs $10,000 and machine B costs $10,500. This department replaces photocopy machines every three years. The repair contract for machine A costs $50 per month and covers an unlimited number of repairs. The repair contract for machine B costs $200 per repair. Based on past performance, the distribution of the number of repairs needed over any one-year period for machine B is shown below.

<table>
<thead>
<tr>
<th>Number of Repairs</th>
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You are asked to give a recommendation based on overall cost as to which machine, A or B, along with its repair contract, should be purchased. What would your recommendation be? Give a statistical justification to support your recommendation.

Machine A costs $10,000. Repair costs for three years (at $50/month) can be estimated at $50 \times 12 \times 3 = 1,800. Therefore Machine A total cost can be estimated at $10,000 + 1,800 = $11,800.

Machine B costs $10,500. The expected value for repairs/year can be found by:

\[ E(\text{# of repairs} \times \text{cost of repair} \times \text{probability of #}) = \sum (0 \times 200 \times 0.5) \ldots (3 \times 200 \times 0.10) = 170/\text{year} \]

170 \times 3 \text{years} = $510 \text{expected repair costs for 3 years for Machine A total cost can be estimated at}

\[ \frac{10,500 + 510}{11,010} \]

Conclusion: Machine B would be a better investment. As long as the number of repairs needed for Machine B follow the predicted pattern, the total sum of expected cost will be much less ($790 less) than expected cost of Machine A.
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You are asked to give a recommendation based on overall cost as to which machine, A or B, along with its repair contract, should be purchased. What would your recommendation be? Give a statistical justification to support your recommendation.

Over a 3-yr. period machine A w/ the repair contract costs $10,000 + ($50)(12)(3) = $11,800

The probability of machine B costing more than machine A = $11,800 - $10,500 = $1300 (number of repairs) = $1200 (number of repairs) = 0.5

The probability over a 3-yr. period of having 7 or more repairs = 0.01975

I would recommend to use machine B because the chance of spending more on machine B than machine A is very small.

\[ P(27 \text{ repairs}) = 0.01975 \]
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$200/each

You are asked to give a recommendation based on overall cost as to which machine, A or B, along with its repair contract, should be purchased. What would your recommendation be? Give a statistical justification to support your recommendation.

\[
\text{expected # of repairs (B) } = 0(0.5) + 1(0.25) + 2(0.15) + 3(0.1) = 0.85
\]

\[
\text{expected $/yr } = 0.85 (200) = \$170/yr
\]

\[
\text{expected $ of B } = $10,500 + $170 = $10,670
\]

\[
\text{expected $ of A w/ repair } = $10,000 + $50(12) = $10,600
\]

I would recommend buying Machine A, along with its repair contract. It only costs $10,600 and you are equipped with unlimited repairs. Whereas, Machine B costs $10,500 but one repair will cost you $200 (bringing total to $10,700). Machine B is expected to have almost one repair a year. Therefore the expected price will be $10,670 which is higher than the fully equipped Machine A priced at a low $10,600/yr.