There are two houses with almost identical characteristics available for investment in two different neighborhoods with drastically different demographic composition. The anticipated gain in value when the houses are sold in 10 years has the following probability distribution:

<table>
<thead>
<tr>
<th>Probability</th>
<th>Neighborhood A</th>
<th>Neighborhood B</th>
</tr>
</thead>
<tbody>
<tr>
<td>.25</td>
<td>-$22,500</td>
<td>$30,500</td>
</tr>
<tr>
<td>.40</td>
<td>$10,000</td>
<td>$25,000</td>
</tr>
<tr>
<td>.35</td>
<td>$40,500</td>
<td>$10,500</td>
</tr>
</tbody>
</table>

• What is the variance of the gain in value for the house in neighborhood A? 12,550
• What is the variance of the gain in value for the house in neighborhood A? 583,147,500
• if you can invest 70% of your money on the house in neighborhood A and the remaining on the house in neighborhood B, what is the portfolio expected return of your investment?
Two different designs on a new line of winter jackets for the coming winter are available for your manufacturing plants. Your profit (in thousands of dollars) will depend on the taste of the consumers when winter arrives. The probability of the three possible different tastes of the consumers and the corresponding profits are presented in the following table.

<table>
<thead>
<tr>
<th>Probability</th>
<th>Taste</th>
<th>Design A</th>
<th>Design B</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.2</td>
<td>more conservative</td>
<td>180</td>
<td>520</td>
</tr>
<tr>
<td>0.5</td>
<td>no change</td>
<td>230</td>
<td>310</td>
</tr>
<tr>
<td>0.3</td>
<td>more liberal</td>
<td>350</td>
<td>270</td>
</tr>
</tbody>
</table>

- what is your expected profit when Design A is chosen?
  - $256 thousands
- what is the variance of your profit when Design B is chosen?
  - 8,400 millions
- what is the standard deviation of your profit when Design A is chosen?
  - $64.37391
- if you decide to choose Design A for half of the production lines and Design B for the other half, what is your expected profit?
  - $ 298 thousands
• How many possible 3 scoop combinations could you create at an ice cream parlor if you have 31 flavors to select from?
• The total choices is $n = 31$, and we select $X = 3$.
• 4495
Suppose the probability of purchasing a defective computer is 0.02. What is the probability of purchasing 2 defective computers in a group of 10?

0.01531
• Suppose that past history shows that 60% of college students prefer Brand C cola. A sample of 5 students is to be selected. The probability that exactly 3 prefer brand C is ________.

• 0.3456

• The number of power outages at a nuclear power plant has a Poisson distribution with a mean of 6 outages per year. The probability that there will be exactly 3 power outages in a year is ____________.

• 0.0892

• An Undergraduate Study Committee of 6 members at a major university is to be formed from a pool of faculty of 18 men and 6 women. If the committee members are chosen randomly, what is the probability that all of the members will be men?

• 0.1379
3 different computers are checked out from 10 in the department. 4 of the 10 computers have illegal software loaded. What is the probability that 2 of the 3 selected computers have illegal software loaded?

.3

The probability that 2 of the 3 selected computers have illegal software loaded is 0.30, or 30%.