Probability

Interpret information and Probability in the Media

If you read a newspaper, or watch television you have encountered statistics about a number of different topics. Statistics are closely related to probability; people use them to make predictions about future events. Probability experiments involve simulating real-life events and using the results to make predictions.

Ex. A local radio station 200 students from one high school to determine their favourite music.

The results are shown in the table.

<table>
<thead>
<tr>
<th>Music</th>
<th>Percent of Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rock</td>
<td>45</td>
</tr>
<tr>
<td>Rap</td>
<td>0.45</td>
</tr>
<tr>
<td>Country</td>
<td>0.20</td>
</tr>
</tbody>
</table>

a) Express each percent as a decimal and a fraction in lowest terms

\[
\frac{45}{100} = \frac{9}{20} \quad \frac{35}{100} = \frac{7}{20} \quad \frac{20}{100} = \frac{1}{5}
\]

b) If there are 4000 high school students in the city, how many of them would you expect to like rock? rap? country?

\[
4000 \times 0.45 = 1800 \\
4000 \times 0.35 = 1400 \\
4000 \times 0.20 = 800
\]

c) Is it possible that the poll may not be accurate? What factors could have influenced the responses?

\[\text{limiting option} \quad \text{only as King one school}\]
Ex. 2. Your high school’s girls’ volleyball team has the following record: seven wins, four losses, and two ties. A win is worth 3 points, a loss is worth zero points, and tie is worth one point.

a) How many points does the team have after 13 games?

\[
\begin{align*}
7 \cdot 3 &= 21 \\
2 \cdot 1 &= 2 \\
\text{total points} &= 23
\end{align*}
\]

b) Predict how many points the volleyball will have if the regular season has 20 games?

\[
\begin{align*}
7 : 4 : 2 \\
W &\rightarrow \frac{7}{13} \cdot 7 = 4 W \\
L &\rightarrow \frac{4}{13} \cdot 7 = 2 L \\
T &\rightarrow \frac{2}{13} \cdot 7 = 1 T
\end{align*}
\]

Ex 3. Michael, Cole, and Jordan won a t-shirt from West 49 at a store grand opening event. Each shirt will be randomly assigned to the three winners; one is red; one is black; and one is green. What is the probability that Michael will receive the black t-shirt, Cole will receive the red shirt and Jordan will receive the green shirt?

\[
\begin{array}{|c|c|c|}
\hline
\text{Michael} & \text{Cole} & \text{Jordan} \\
\hline
B & R & G \\
B & G & R \\
B & B & G \\
G & G & B \\
G & B & B \\
G & R & G \\
\hline
\end{array}
\]

Michael \( \frac{2}{6} = \frac{1}{3} \)  
Cole \( \frac{2}{6} = \frac{1}{3} \)  
Jordan \( \frac{2}{6} = \frac{1}{3} \)
GM's OnStar service is a wireless communication system between a central call centre and an OnStar enabled car, allowing drivers to call for help or ask for other services. The volume of monthly OnStar activity reported by Richard Russell at http://onstar.symantec.msn.co.uk/guides_and_advice/article.aspx?cp-documentid=63550 is as follows:

- 1,000 airbag deployment calls
- 200 crash notifications
- 11,000 emergency service calls
- 3,400 'Good Samaritan' calls; Orange Alerts; someone in trouble etc.
- 325 stolen vehicle location assists
- 41,000 remote unlock calls
- 24,000 requests for roadside assistance
- 329,000 requests for route assistance
- Total number of calls: 412,025

1) If you were an OnStar Operator what would be the probability of the next call being a person needing some roadside assistance?

\[
\frac{329000}{412025} = 0.80\%
\]

2) If you were an OnStar Operator what would be the probability of the next call being a person needing their car unlocked?

\[
\frac{41000}{412025} = 0.10\%
\]

3) What type of call has the highest probability? What is it?

4) What type of call has the lowest probability? What is it?

5) Based on what you've seen in the media what type of headline might you see in a newspaper based on the statistics given above?

6) How accurate might those headlines be based on what you know about statistics?

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Don't know how good they are