FEEDBACK TUTORIAL LETTER

1ST SEMESTER 2021

Test 1 & 2 Memos

Basic Business Statistics 1A
BBS111S
Question 1 [10 marks]

1.1 C ✔ ✔
1.2 A ✔ ✔
1.3 C ✔ ✔
1.4 A ✔ ✔
1.5 D ✔ ✔

Question 2 [20 marks]

2.1

2.1.1 Continuous, Ratio ✔ ✔ ✔
2.1.2 Nominal ✔ ✔ ✔
2.1.3 Ordinal ✔ ✔ ✔
2.1.4 Ordinal ✔ ✔ ✔
2.1.5 Nominal ✔ ✔ ✔

2.2

2.2.1

<table>
<thead>
<tr>
<th>Stem</th>
<th>leaf</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>8 9</td>
</tr>
<tr>
<td>1</td>
<td>3 4 4 4 8 9 9</td>
</tr>
<tr>
<td>2</td>
<td>0 1 1 1 2 7 8</td>
</tr>
<tr>
<td>3</td>
<td>1 2 3</td>
</tr>
<tr>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>0</td>
</tr>
</tbody>
</table>

The distribution is positively skewed (skewed to the right)

2.2.2

\[ \overline{x} = \frac{\sum x_i}{n} = \frac{547}{22} = 24.8636 \] (On average each student scored 24.8636 in the test) ✔ ✔ ✔

Median = 21 (One half of the students scored less than 21 and the other half more than 21) ✔ ✔ ✔

Mode = 14 and 21 (Most of the students scored either 14 or 21 in the test) ✔ ✔ ✔
Question 3 [10 marks]

3.1.1
\[
\bar{x} = \frac{\sum f_i x_i}{n} = \frac{5335}{61} = 87.4590
\]

3.1.2
\[
S^2 = \frac{\sum f_i x_i^2 - n(\bar{x})^2}{n-1} = \frac{476125 - 61(87.4590)^2}{60}
\]
\[
= 158.8554
\]
\[
S = \sqrt{158.8554} = 12.6038
\]

3.1.3
\[
CV = \frac{s}{\bar{x}} \times 100
\]
\[
= \frac{12.6038}{87.4590} \times 100
\]
\[
= 14.4111\%\]

Low variability and tight clustering of observations about the mean

~~~Total Mark = 40~~~
Question 1 [10 marks]

1.1 C ✓ ✓
1.2 C ✓ ✓
1.3 A ✓ ✓
1.4 B ✓ ✓
1.5 A or C ✓ ✓

Question 2 [15 marks]

2.1
2.1.1 S = {RR, RB, RG, BR, BB, BG, GR, GB, GG} ✓ ✓

2.1.2 \[ P(\text{same color}) = P(\text{RR}) + P(\text{BB}) + P(\text{GG}) = \frac{2}{9} + \frac{1}{15} + \frac{1}{45} \]
\[ = \frac{14}{45} \approx 0.3111 ✓ \]

2.2
2.2.1 S = {RR, RB, BR, BB} ✓ ✓

2.2.2 \[ P(\text{second red}) = P(\text{RR}) + P(\text{BR}) = \frac{9}{40} + \frac{5}{16} \]
\[ = \frac{43}{80} \approx 0.5375 ✓ \]

2.2.3 \[ P(R_1 | R_2) = \frac{P(R_1) P(R_2 | R_1)}{P(R_2)} = \frac{(3/8)(6/10)}{(43/80)} = \frac{13}{43} \approx 0.3023 ✓ \]

2.2.4 \[ P(B_1 | B_2) = \frac{P(B_1) P(B_2 | B_1)}{P(B_2)} = \frac{(5/8)(5/10)}{(7/80)} = \frac{25}{27} \approx 0.9259 ✓ \]
**Question 3 [200 marks]**

### 3.1.1

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Production</th>
<th>Sales</th>
<th>Office</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;25</td>
<td>50</td>
<td>2</td>
<td>50</td>
<td>102</td>
</tr>
<tr>
<td>25-40</td>
<td>70</td>
<td>24</td>
<td>50</td>
<td>144</td>
</tr>
<tr>
<td>&gt;40</td>
<td>40</td>
<td>4</td>
<td>10</td>
<td>54</td>
</tr>
<tr>
<td>Total</td>
<td>160</td>
<td>30</td>
<td>110</td>
<td>300</td>
</tr>
</tbody>
</table>

3.1.2

(a) \( P(< 40) \)

\[
\frac{246}{300} \approx 0.82
\]

(b) \( P(P) \)

\[
\frac{160}{300} \approx 0.533\checkmark
\]

(c) \( P(S \cap 25 - 40) \)

\[
\frac{24}{300} \approx 0.08 \checkmark
\]

(d) \( P(> 40 | O) \)

\[
\frac{P(> 40 \cap O)}{P(O)} = \frac{10}{110} \approx 0.09090 \checkmark \checkmark
\]

(e) \( P(P \cup < 25) \)

\[
= P(P) + P(< 25) - P(P \cap < 25)
\]

\[
= \frac{53}{75} \approx 0.7067 \checkmark
\]
3.2

3.2.1 \( P(S) = P(A) \times P(S \mid A) + P(B) \times P(S \mid B) + P(C) \times P(S \mid C) \)
\[= 0.075 + 0.13125 + 0.05 \]
\[= 0.25625 \checkmark \]

3.2.2 \( P(B \mid S) = \frac{P(S \mid B) \times P(B)}{P(S)} \)
\[= \frac{0.13125}{0.25625} \checkmark \]
\[= 0.512 \checkmark \]

3.2.3 \( P(C \mid S^c) = \frac{P(S^c \mid C) \times P(C)}{P(S^c)} \)
\[= \frac{0.6 \times 0.125}{0.74375} \checkmark \]
\[= 0.1008 \checkmark \]

~~~~~Total Mark = 45 ~~~~~