

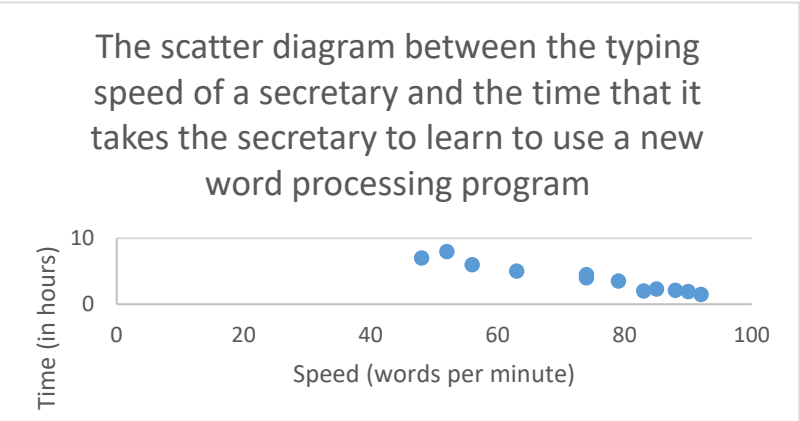


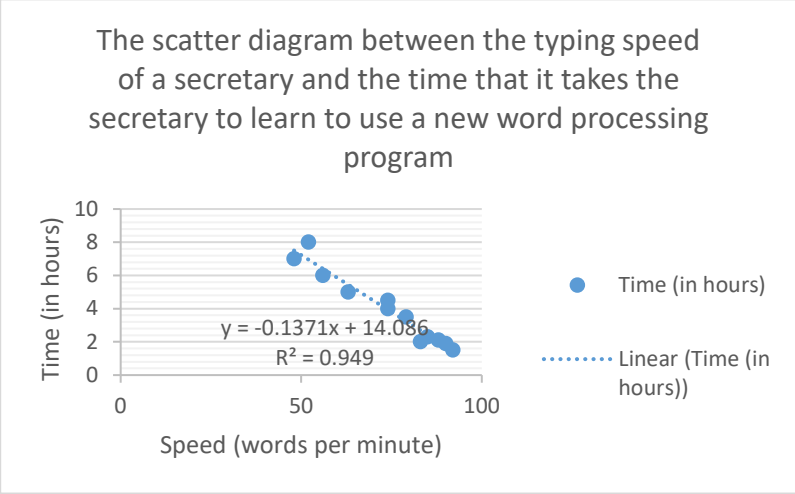
**UNIVERSITI TEKNOLOGI MARA
ASSESSMENT 2**

COURSE	:	INTRODUCTION TO STATISTICS
COURSE CODE	:	QMT181/STA104
DATE	:	1ST JULY 2022
TIME	:	9.00 – 11.00 AM (120 MINUTES)

ANSWER SCHEME

(PLEASE CHECK THE SOLUTIONS BEFORE BEGIN MARKING)

QUESTION	SOLUTION	MARKS
1. (a)	<p>Independent variable: Speed (words per minute) ✓✓</p> <p>Dependent variable: Time (hours) ✓✓</p>	2 marks
(b)	<p>The scatter diagram between the typing speed of a secretary and the time that it takes the secretary to learn to use a new word processing program</p>  <p>Title ✓</p> <p>Label for x-axis and y-axis ✓✓</p> <p>Plotting ✓✓✓</p>	3 marks
(c)	$\begin{aligned}\sum X^2 &= 67728, \sum X \\ &= 884, \sum Y^2 \\ &= 242.06, \sum Y = 47.8, \sum XY = 3163.8, n = 12\end{aligned}$ <p>All summation values ✓✓✓✓</p> $r = \frac{12(3163.8) - (884)(47.8)}{\sqrt{[12(67728) - (884)^2][12(242.06) - (47.8)^2]}}$ $= -0.9742$ <p>Substitute into formula ✓✓</p> <p>Final answer ✓</p> <p>There is a strong negative relationship between the typing speed of a secretary and the time that it takes the secretary to learn to use a new word processing program. ✓✓</p>	4 marks
(d)	$b = \frac{12(3163.8) - (884)(47.8)}{12(67728) - (884)^2} = -0.1371$	1 mark

	$a = \frac{47.8}{12} - (-0.1371) \frac{884}{12} = 14.0857$ $\therefore y = 14.0857 - 0.1371x$ <p>The scatter diagram between the typing speed of a secretary and the time that it takes the secretary to learn to use a new word processing program</p> 	<p>5 marks</p> <p>1 mark (regression line)</p>								
(e)	<p>For every 10 words increase in typing speed per minute, the time it takes a secretary to learn to use a new word processing program decreased by 1.371 hours.</p>	<p>1 mark</p>								
(f)	$y = 14.0857 - 0.1371(70) = 4.4887 \text{ hours}$	<p>3 marks</p>								
2.(a)	<table border="1"> <thead> <tr> <th>Types of Onion</th> <th>Simple Relative Quantity Index</th> </tr> </thead> <tbody> <tr> <td>Shallots</td> <td>107.2727</td> </tr> <tr> <td>Red onion</td> <td>121.4286</td> </tr> <tr> <td>Yellow onion</td> <td>143.3333</td> </tr> </tbody> </table> <p>Hence, yellow onion is the highest increase in shipping container for 2021.</p>	Types of Onion	Simple Relative Quantity Index	Shallots	107.2727	Red onion	121.4286	Yellow onion	143.3333	<p>4 marks</p>
Types of Onion	Simple Relative Quantity Index									
Shallots	107.2727									
Red onion	121.4286									
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(b)	$I = \frac{(4.1 \times 590) + (6.5 \times 850) + (7.2 \times 860)}{(3 \times 590) + (5 \times 850) + (7 \times 860)} \times 100$ $I = \frac{14136}{12040} \times 100 = 117.41$	<p>3 marks</p>								

(c)	$I = \frac{4.1 + 6.5 + 7.2}{3 + 5 + 7} \times 100$ $I = \frac{17.8}{15} \times 100 = 118.67$	3 marks																																								
3.(a)	$T = 100 + 3.5 = 103.5$ $99.5 + 102.6 + 103.5 + F = 400$ $F = 400 - 305.6 = 94.4$	2 marks																																								
(b)(i)	<table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th style="width: 15%;">Year</th> <th style="width: 20%;">Jan - Apr</th> <th style="width: 20%;">May - Aug</th> <th style="width: 20%;">Sept - Dec</th> <th style="width: 25%;"></th> </tr> </thead> <tbody> <tr> <td>2012</td> <td>-</td> <td>0.7755</td> <td>1.2468</td> <td></td> </tr> <tr> <td>2013</td> <td>0.9571</td> <td>0.8343</td> <td>1.1932</td> <td></td> </tr> <tr> <td>2014</td> <td>0.9725</td> <td>0.8457</td> <td>1.2000</td> <td></td> </tr> <tr> <td>2015</td> <td>0.9385</td> <td>0.8529</td> <td>-</td> <td></td> </tr> <tr> <td>Average</td> <td>0.9560</td> <td>0.8271</td> <td>1.2133</td> <td>2.9964</td> </tr> <tr> <td>Adjustment</td> <td colspan="3">3/2.9964 = 1.0012</td> <td></td> </tr> <tr> <td>Seasonal Index</td> <td>0.9571</td> <td>0.8281</td> <td>1.2148</td> <td>3</td> </tr> </tbody> </table>	Year	Jan - Apr	May - Aug	Sept - Dec		2012	-	0.7755	1.2468		2013	0.9571	0.8343	1.1932		2014	0.9725	0.8457	1.2000		2015	0.9385	0.8529	-		Average	0.9560	0.8271	1.2133	2.9964	Adjustment	3/2.9964 = 1.0012				Seasonal Index	0.9571	0.8281	1.2148	3	5 marks
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(c)	$TVV = \frac{T_L - T_1}{n-1} = \frac{68 - 49}{9} = 2.1111$ $T = T_L + TVV(t) = 68 + 2.1111(4) = 76.4444$ $Y = 76.4444 \times 1.2148 = 92.8647 \approx 93 \text{ accidents}$	3 marks																																								