

# Tables with Associated Questions and Answers

Image	Questions and Answers								
<table><tr><th>Section</th><th>Tracking number (if applicable) and description</th><th>Major change (Y or N)</th><th>Change type</th></tr><tr><td>7 Appendix B: Product Behavior</td><td>Updated list of supported products.</td><td>Y</td><td>Content updated due to protocol revision.</td></tr></table>	Section	Tracking number (if applicable) and description	Major change (Y or N)	Change type	7 Appendix B: Product Behavior	Updated list of supported products.	Y	Content updated due to protocol revision.	<p>Q1: What is the Section name?</p> <p>A1: 7 Appendix B: Product Behavior</p> <p>Q2: Is there a major change?</p> <p>A2: Y</p>
Section	Tracking number (if applicable) and description	Major change (Y or N)	Change type						
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<table border="1"> <thead> <tr> <th data-bbox="234 293 496 356">Attribute</th><th data-bbox="496 293 735 356">Description</th></tr> </thead> <tbody> <tr> <td data-bbox="234 356 496 640">AccessLocation</td><td data-bbox="496 356 735 640">An indicator of whether the client is connecting from inside or outside of the network.</td></tr> <tr> <td data-bbox="234 640 496 987">Fqdn</td><td data-bbox="496 640 735 987">The fully qualified domain name (FQDN) of the Session Initiation Protocol (SIP) server.</td></tr> <tr> <td data-bbox="234 987 496 1162">href</td><td data-bbox="496 987 735 1162">A URL that is relative to the service's root URL</td></tr> <tr> <td data-bbox="234 1162 496 1305">Port</td><td data-bbox="496 1162 735 1305">The listening port of the SIP server.</td></tr> <tr> <td data-bbox="234 1305 496 1865">token</td><td data-bbox="496 1305 735 1865">A classification that is used to infer the purpose and use of the attributed item. Somewhat analogous to a type in traditional, compiled programming languages</td></tr> </tbody> </table>	Attribute	Description	AccessLocation	An indicator of whether the client is connecting from inside or outside of the network.	Fqdn	The fully qualified domain name (FQDN) of the Session Initiation Protocol (SIP) server.	href	A URL that is relative to the service's root URL	Port	The listening port of the SIP server.	token	A classification that is used to infer the purpose and use of the attributed item. Somewhat analogous to a type in traditional, compiled programming languages	<p><b>Q1:</b> What is AccessLocation's description?</p> <p><b>A1:</b> An indicator whether the client is connecting from inside or outside of the network</p> <p><b>Q2:</b> List the attributes.</p> <p><b>A2:</b> AccessLocation, Fqdn, href, Port, token</p>
Attribute	Description												
AccessLocation	An indicator of whether the client is connecting from inside or outside of the network.												
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Image

Tag name	Token	Protocol versions
Subject	0x05	14.0, 14.1, 16.0, 16.1
MessageClass	0x06	14.0, 14.1, 16.0, 16.1
LastModifiedDate	0x07	14.0, 14.1, 16.0, 16.1
Categories	0x08	14.0, 14.1, 16.0, 16.1
Category	0x09	14.0, 14.1, 16.0, 16.1

Questions and Answers

Q1: What is the subject’s token?

A1: 0x05

Q2: What Protocol versions are used?

A2: 14.0, 14.1, 16.0, 16.1

Callback configuration option	Callback type	Description
No callback	0x01	The caller requests not to be called back.
Callback to a user-specified number	0x02	The caller requests to be called at the specified address.
Callback to a pre-specified number	0x03	The caller will be called at a pre-specified address. This specifies only the callback type. The actual address to be used for callback is specific to the administrative configuration and is outside the scope of this protocol.

Q1: What is the Callback type for No Callback?

A1: 0x01

Q2: What configuration option corresponds to “The caller requests to be called at the specified address”?

A2: Callback to a user-specified number

$\beta$	Extremal case
0.5	$q \approx 0.991 M$
0.7	$q \approx 1.023 M$
1	$q \approx 1.055 M$
2.4	$q \approx 1.124 M$
4	$q \approx 1.153 M$
7	$q \approx 1.175 M$
10	$q \approx 1.186 M$
100	$q \approx 1.210 M$

Q1: What is the Extremal case when  $\beta$  (Beta) is 0.5?

A1:  $q = 0.991M$

Q2: What  $\beta$  (Beta) value is associated with an extremal case of  $q = 1.175M$ ?

A2: 7

Statistics	Trust per user	Be Trusted per user
Max	1983	2941
Min	1	0
Average	4.76	4.76
	Distrust per user	Be Distrusted per user
Max	1188	429
Min	1	0
Average	0.91	0.91

Q1: What is the max trust per user?

A1: 1983

Q2: What is the Be Distrusted per user average?

A2: 0.91

Image

Method	# of Trust Relations	# of Distrust Relations	Measure	Accuracy
MF+TD	433,619 (= 90%)	9,682 (= 10%)	MAE	0.8803 ± 0.051
			RMSE	1.2166 ± 0.028
		19,364 (= 20%)	MAE	0.8755 ± 0.033
			RMSE	1.1944 ± 0.042
		29,047 (= 30%)	MAE	0.8604 ± 0.036
			RMSE	1.1822 ± 0.081
		38,729 (= 40%)	MAE	0.8431 ± 0.047
			RMSE	1.1706± 0.055
		48,411 (= 50%)	MAE	<b>0.8165</b> ± 0.056
			RMSE	<b>1.1425</b> ± 0.091
		58,093 (= 60%)	MAE	0.8130± 0.035
			RMSE	1.1380 ± 0.046
		67,776 (= 70%)	MAE	0.8122 ± 0.041
			RMSE	1.1306 ± 0.042
		77,458 (= 80%)	MAE	0.8095 ± 0.036
			RMSE	1.1290 ± 0.085
		87,140 (= 90%)	MAE	0.8061 ± 0.044
			RMSE	1.1176 ± 0.067
		96,823 (= 100%)	MAE	0.8050 ± 0.052
			RMSE	1.1092 ± 0.063
MF+T	481,799 (= 100%)	0	MAE	0.8158 ± 0.016
			RMSE	1.1403 ± 0.027

Questions and Answers

Q1: What is the # of trusted relations for the MF+TD method?

A1: 433,619 (=90%)

Q2: What is the MAE Accuracy for the for the MF+T method?

A2: 0.8158 +- 0.016

TABLE 6.1: System design considerations with respect to framework implementation.

Design consideration	Implementation detail
Licensing	Free
Programming language	PYTHON 3.10
Data storage	PANDAS DATAFRAMES, NUMPY ARRAYS, PYTHON PICKLES
IDE	VISUAL STUDIO CODE
Connectivity	Offline

Q1: What is Licensing’s Implementation detail?

A1: Free

Q2: What IDE was used?

A2: Visual Studio Code

	$A_0$	$X_1$	$\lambda_a$	$D$
$SU(2)_L$	<b>1</b>	<b>3</b>	<b>2</b>	<b>1</b>
$U(1)_R$	0	0	$\frac{1}{2}$	0

Q1: What is the X1 value associated with SU(2)?

A1: 3

Q2: What is the D value for U(1)?

A2: 0

Train		Evaluation 1		Evaluation 2	
Movie	Count	Movie	Count	Movie	Count
Hobbit	194	Gravity	30	Dallas Buyers Club	41
Frozen	107	Hobbit	27	Non Stop	24
Gravity	106	Frozen	26	Lego Movie	21
12 Years a Slave	96	12 Years a Slave	17	Lone Survivor	20
Son of God	14	Lord of the Rings	4	Jack Ryan Shadow Recruit	2
Entities	667	Entities	129	Entities	115
Movies	49	Movies	20	Movies	8

Q1: What is the count for the Hobbit movie?

A1: 194

Q2: How many Entities are there in the Evaluation 1 set?

A2: 129

Image	Questions and Answers																																																
<table><tr><th rowspan="2">Model</th><th colspan="3">Evaluation 1</th><th colspan="3">Evaluation 2</th></tr><tr><th>P</th><th>R</th><th>F1</th><th>P</th><th>R</th><th>F1</th></tr><tr><td>Baseline: Section 3.2</td><td>14.45</td><td>96.10</td><td>25.13</td><td>13.82</td><td>96.52</td><td>24.18</td></tr><tr><td>Model 1: Baseline + Section 3.3.1</td><td>75.00</td><td>28.13</td><td>40.09</td><td>87.60</td><td>55.65</td><td>68.09</td></tr><tr><td>Model 2: Model 1 + Section 3.3.2</td><td><b>89.01</b></td><td>63.28</td><td>73.97</td><td><b>88.64</b></td><td>67.83</td><td>76.85</td></tr><tr><td>Model 3: Model 2 + Section 3.3.4</td><td>85.44</td><td>68.75</td><td>76.19</td><td>84.16</td><td><b>73.91</b></td><td><b>78.70</b></td></tr><tr><td>Model 4: Model 3 + Section 3.3.3</td><td>84.76</td><td><b>69.53</b></td><td><b>76.39</b></td><td>79.25</td><td>73.04</td><td>76.01</td></tr></table>	Model	Evaluation 1			Evaluation 2			P	R	F1	P	R	F1	Baseline: Section 3.2	14.45	96.10	25.13	13.82	96.52	24.18	Model 1: Baseline + Section 3.3.1	75.00	28.13	40.09	87.60	55.65	68.09	Model 2: Model 1 + Section 3.3.2	<b>89.01</b>	63.28	73.97	<b>88.64</b>	67.83	76.85	Model 3: Model 2 + Section 3.3.4	85.44	68.75	76.19	84.16	<b>73.91</b>	<b>78.70</b>	Model 4: Model 3 + Section 3.3.3	84.76	<b>69.53</b>	<b>76.39</b>	79.25	73.04	76.01	<p><b>Q1:</b> What is the P value in Evaluation 1 for the Baseline model?</p> <p><b>A1:</b> 14.45</p> <p><b>Q2:</b> What is the F1 value in Evaluation 2 for model 3?</p> <p><b>A2:</b> 78.70</p>
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<p>TABLE 6.4: Modified ResNet-18 detailed architecture.</p> <table><tr><th>Layer name</th><th>Output size</th><th>ResNet-18</th></tr><tr><td>Input</td><td>224 x 224</td><td>Single channel</td></tr><tr><td>Conv1_x</td><td>112 x 112</td><td>7 x 7, 64 stride 2</td></tr><tr><td>Conv2_x</td><td>56 x 56</td><td>3 x 3 max pool, stride 2 <math>\begin{bmatrix} 3 \times 3, 64 \\ 3 \times 3, 64 \end{bmatrix} \times 2</math></td></tr><tr><td>Conv3_x</td><td>28 x 28</td><td><math>\begin{bmatrix} 3 \times 3, 128 \\ 3 \times 3, 128 \end{bmatrix} \times 2</math></td></tr><tr><td>Conv4_x</td><td>14 x 14</td><td><math>\begin{bmatrix} 3 \times 3, 256 \\ 3 \times 3, 256 \end{bmatrix} \times 2</math></td></tr><tr><td>Conv5_x</td><td>7 x 7</td><td><math>\begin{bmatrix} 3 \times 3, 512 \\ 3 \times 3, 512 \end{bmatrix} \times 2</math></td></tr><tr><td>FC</td><td>1 x 1</td><td>Global average pooling Fully connected 5</td></tr></table>	Layer name	Output size	ResNet-18	Input	224 x 224	Single channel	Conv1_x	112 x 112	7 x 7, 64 stride 2	Conv2_x	56 x 56	3 x 3 max pool, stride 2 $\begin{bmatrix} 3 \times 3, 64 \\ 3 \times 3, 64 \end{bmatrix} \times 2$	Conv3_x	28 x 28	$\begin{bmatrix} 3 \times 3, 128 \\ 3 \times 3, 128 \end{bmatrix} \times 2$	Conv4_x	14 x 14	$\begin{bmatrix} 3 \times 3, 256 \\ 3 \times 3, 256 \end{bmatrix} \times 2$	Conv5_x	7 x 7	$\begin{bmatrix} 3 \times 3, 512 \\ 3 \times 3, 512 \end{bmatrix} \times 2$	FC	1 x 1	Global average pooling Fully connected 5	<p><b>Q1:</b> What is the output size of the Input layer?</p> <p><b>A1:</b> 224 x 224</p> <p><b>Q2:</b> What is the ResNet-18 for the FC layer?</p> <p><b>A2:</b> Global average pooling. Fully connected 5.</p>																								
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<p>TABLE 5.1: Advantages and disadvantages of using Docker containers and VMs.</p> <table><tr><th></th><th>Docker</th><th>VMs</th></tr><tr><td><b>Advantages</b></td><td>Smaller footprint Faster start-up time Easier to manage</td><td>Complete isolation More resources Hardware support</td></tr><tr><td><b>Disadvantages</b></td><td>Limited resources Limited isolation Limited hardware support</td><td>Larger footprint Slower start-up time More complex to manage</td></tr></table>		Docker	VMs	<b>Advantages</b>	Smaller footprint Faster start-up time Easier to manage	Complete isolation More resources Hardware support	<b>Disadvantages</b>	Limited resources Limited isolation Limited hardware support	Larger footprint Slower start-up time More complex to manage	<p><b>Q1:</b> What is the advantages of Docker?</p> <p><b>A1:</b> Smaller footprint, Faster start-up time, Easier to manage.</p> <p><b>Q2:</b> What is the Disadvantages of VMs?</p> <p><b>A2:</b> Larger footprint, Slower start-up time, More complex to manage.</p>																																							
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<p>TABLE 13.2: Building types corresponding to each column in the array encoding of candidate solutions.</p> <table><tr><th>Land-use</th><th colspan="7">Residential</th><th colspan="7">Non-residential</th></tr><tr><td>Building type ID</td><td>201</td><td>202</td><td>204</td><td>205</td><td>401</td><td>505</td><td>507</td><td>601</td><td>605</td><td>610</td><td>701</td><td>705</td></tr><tr><td>Array index</td><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td></tr></table>	Land-use	Residential							Non-residential							Building type ID	201	202	204	205	401	505	507	601	605	610	701	705	Array index	0	1	2	3	4	5	6	7	8	9	10	11	<p><b>Q1:</b> What is the array index of building type ID '201'?</p> <p><b>A1:</b> 0</p> <p><b>Q2:</b> What are the two Land-use types?</p> <p><b>A2:</b> Residential and non-residential.</p>							
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Image

TABLE 9.1: Data entries (rows) representing the daily product unit sales at ten Walmart stores over a period of 1913 days covering the period 29 January 2011 to 24 April 2016.

	id	d.1	d.2	d.3	...	d.1911	d.1912	d.1913
1	HOBBIES_1.001_CA.1	0	0	0	...	0	1	1
2	HOBBIES_1.002_CA.1	0	0	0	...	0	0	0
3	HOBBIES_1.003_CA.1	0	0	0	...	1	1	1
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
30 488	FOODS_3.823_WI.3	0	6	0	...	0	1	0
30 489	FOODS_3.824_WI.3	0	0	0	...	3	1	3
30 490	FOODS_3.827_WI.3	0	0	0	...	0	0	0

Questions and Answers

**Q1:** What is the d.1 value for HOB-BIES\_1.001\_CA.1?

**A1:** 0

**Q2:** What is the d\_1913 value for FOODS\_3\_824\_WI.3?

**A2:** 3

TABLE 9.4: The features with the largest feature importance scores returned by the GBT to achieve a classification accuracy greater than 50%.

Feature number	Feature name	Feature parameters
1	agg_autocorrelation	f.agg: var, maxlag: 40
2 – 8	agg_linear.trend	attr: rvalue, chunk.len: 10, f.agg: mean;
		attr: slope, chunk.len: 5, f.agg: mean;
		attr: slope, chunk.len: 50, f.agg: mean;
		attr: slope, chunk.len: 10, f.agg: mean;
		attr: rvalue, chunk.len: 5, f.agg: var;
9	approximate_entropy	m: 2, r: 0.7
10	ar_coefficients	coeff: 0, k: 10
11 – 13	autocorrelation	lag: 1; lag: 2; lag: 4
14	cwt_coefficients	widths: (2,5,10,20), coeff: 0.7, w: 20
15	energy_ratio_by_chunks	num.segments: 10, segment_focus: 0
16	fft_aggregated	aggtype: variance
17-23	index_mass_quantile	q: 0.1; q: 0.2; q: 0.4; q: 0.6; q: 0.7; q: 0.8; q: 0.9
24	length	None
25 – 26	linear_trend	attr: rvalue; attr: intercept
27 – 28	number_cwt_peaks	n: 1; n: 5
29	number_peaks	n:1
30	skewness	None

TABLE A.1: Exploring the different aggregation levels of the M5 competition data set.

Agg level	Description	# of ts	Daily (1941)		Weekly (278)		Monthly (65)		Quarterly (22)	
			S/N	% zeros	S/N	% zeros	S/N	% zeros	S/N	% zeros
Level 12	Product.store	30 490	0.541	68.00	0.996	39.88	1.306	29.75	1.574	23.62
Level 11	Product.state	9 147		45.41		26.67		22.89		19.12
Level 10	Product	3 049	1.194	29.35	1.763	21.99	1.965	19.78	2.249	17.24
Level 9	Store.department	70	3.519	0.27		0		0		0
Level 8	Store.category	30		0.22	5.104	0	4.657	0	4.959	0
Level 7	State.department	21		0.21		0		0		0
Level 6	State.category	9	3.937	0.17	5.607	0	4.994	0	5.296	0
Level 5	Department	7		0.18		0		0		0
Level 4	Category	3	4.241	0.16	5.754	0	5.118	0	5.410	0
Level 3	Category	10		0.12		0		0		0
Level 2	State	3	4.42	0	6.462	0	5.503	0	5.755	0
Level 1	Total	1		0		0		0		0

**Q1:** What is the description of Level 12?

**A1:** Product\_store

**Q2:** What is the montly % zeros of the Product (level 10)?

**A2:** 19.78

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<p>TABLE 3.2: A taxonomy of common time series forecasting models from the literature.</p> <table><tr><th>Domain</th><th>Model</th><th>Univariate</th><th>Multivariate</th><th>Probabilistic</th></tr><tr><td rowspan="6">Statistical</td><td>Naive baselines</td><td>✓</td><td></td><td>✓</td></tr><tr><td>Moving averages</td><td>✓</td><td></td><td>✓</td></tr><tr><td>Exponential smoothing</td><td>✓</td><td></td><td>✓</td></tr><tr><td>Regression</td><td></td><td>✓</td><td>✓</td></tr><tr><td>(V)ARIMA</td><td>✓</td><td>✓</td><td>✓</td></tr><tr><td>(G)ARCH</td><td>✓</td><td>✓</td><td>✓</td></tr><tr><td></td><td>Kalman filter</td><td>✓</td><td>✓</td><td>✓</td></tr><tr><td rowspan="4">Machine learning</td><td>Feedforward NNs</td><td>✓</td><td>✓</td><td>✓</td></tr><tr><td>RNNs</td><td>✓</td><td>✓</td><td>✓</td></tr><tr><td>CNNs</td><td>✓</td><td>✓</td><td>✓</td></tr><tr><td>Transformers</td><td>✓</td><td>✓</td><td>✓</td></tr><tr><td rowspan="3">Intermittent</td><td>Decision trees</td><td>✓</td><td>✓</td><td>✓</td></tr><tr><td>Croston</td><td>✓</td><td></td><td></td></tr><tr><td>SBA</td><td>✓</td><td></td><td></td></tr><tr><td></td><td>TSB</td><td>✓</td><td></td><td></td></tr></table>	Domain	Model	Univariate	Multivariate	Probabilistic	Statistical	Naive baselines	✓		✓	Moving averages	✓		✓	Exponential smoothing	✓		✓	Regression		✓	✓	(V)ARIMA	✓	✓	✓	(G)ARCH	✓	✓	✓		Kalman filter	✓	✓	✓	Machine learning	Feedforward NNs	✓	✓	✓	RNNs	✓	✓	✓	CNNs	✓	✓	✓	Transformers	✓	✓	✓	Intermittent	Decision trees	✓	✓	✓	Croston	✓			SBA	✓				TSB	✓			<p><b>Q1:</b> Is the Naïve baselines model univariate?</p> <p><b>A1:</b> Yes</p> <p><b>Q2:</b> Are the machine learning models in- variate, multivariate, and Probabilistic?</p> <p><b>A2:</b> Yes</p>																									
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<p>TABLE 4.1: Inventory classification categories and metrics proposed by Krishnadevarajan et al. [186].</p> <table><tr><th>Revenue</th><th>Customer service</th><th>Profitability</th><th>Growth</th><th>Risk</th></tr><tr><td>Sales value</td><td>Lead time</td><td>Gross profit margin</td><td>Revenue trend</td><td>Number of suppliers</td></tr><tr><td>Sales quantity</td><td>Lead time variability</td><td>Gross profit value</td><td>Gross margin trend</td><td>Number of customers</td></tr><tr><td rowspan="2">Cost of goods sold</td><td>Number of stock-outs</td><td>Gross margin return on investment</td><td>Product life cycle</td><td>Pricing variability</td></tr><tr><td>Inventory turns</td><td></td><td></td><td>Number of dependent items</td></tr><tr><td></td><td></td><td></td><td></td><td>Demand stability index</td></tr></table>	Revenue	Customer service	Profitability	Growth	Risk	Sales value	Lead time	Gross profit margin	Revenue trend	Number of suppliers	Sales quantity	Lead time variability	Gross profit value	Gross margin trend	Number of customers	Cost of goods sold	Number of stock-outs	Gross margin return on investment	Product life cycle	Pricing variability	Inventory turns			Number of dependent items					Demand stability index	<p><b>Q1:</b> What is the 1st entry under Rev- enue?</p> <p><b>A1:</b> Sales value</p> <p><b>Q2:</b> What category does Inventory turns belong too?</p> <p><b>A2:</b> Customer service</p>																																																																		
Revenue	Customer service	Profitability	Growth	Risk																																																																																												
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<p>TABLE 2.1: A confusion matrix in the case of binary classification (adapted from [264]).</p> <table><tr><th colspan="2" rowspan="2"></th><th colspan="2">Actual class</th></tr><tr><th>+</th><th>−</th></tr><tr><th rowspan="2">Predicted class</th><th>+</th><td>True Positive (TP)</td><td>False Positive (FP)</td></tr><tr><th>−</th><td>False Negative (FN)</td><td>True Negative (TN)</td></tr></table>			Actual class		+	−	Predicted class	+	True Positive (TP)	False Positive (FP)	−	False Negative (FN)	True Negative (TN)	<p><b>Q1:</b> What is it called when both the Pre- dicted class and Actial class is positive?</p> <p><b>A1:</b> True Positive (TP)</p> <p><b>Q2:</b> What is it called when both the Pre- dicted class is positive and Actial class is negative?</p> <p><b>A2:</b> False Positive (FP)</p>																																																																																		
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<p>TABLE 5.4: Output data related to the optimal solution to the small illustrative example problem instance of the model (5.1)–(5.18), corresponding to the input data in Tables 5.1–5.3, for the strategic phase of the FVRP.</p> <table><tr><th>Vehicle, <math>k</math></th><th>From <math>i</math></th><th>To <math>j</math></th><th><math>q_j/f_j</math></th><th><math>T_{jk}</math></th></tr><tr><td rowspan="6">3</td><td rowspan="5">Depot</td><td>3</td><td>11.18</td><td>182.40</td></tr><tr><td>3</td><td>8</td><td>7.07</td><td>270</td></tr><tr><td>8</td><td>2</td><td>8.90</td><td>347.68</td></tr><tr><td>2</td><td>7</td><td>7.61</td><td>453.43</td></tr><tr><td>7</td><td>Depot</td><td>—</td><td>548.47</td></tr><tr><td>Total</td><td></td><td></td><td>34.76</td><td></td></tr><tr><td rowspan="7">4</td><td rowspan="6">Depot</td><td>10</td><td>8.87</td><td>140.52</td></tr><tr><td>10</td><td>9</td><td>12.65</td><td>199.35</td></tr><tr><td>9</td><td>6</td><td>9.72</td><td>270</td></tr><tr><td>6</td><td>8</td><td>7.07</td><td>367.24</td></tr><tr><td>8</td><td>7</td><td>7.61</td><td>476.54</td></tr><tr><td>7</td><td>Depot</td><td>—</td><td>571.59</td></tr><tr><td>Total</td><td></td><td></td><td>45.92</td><td></td></tr><tr><td rowspan="8">5</td><td rowspan="7">Depot</td><td>1</td><td>14.61</td><td>75.17</td></tr><tr><td>1</td><td>10</td><td>8.87</td><td>183.47</td></tr><tr><td>10</td><td>4</td><td>16.40</td><td>270</td></tr><tr><td>4</td><td>5</td><td>11.43</td><td>356.22</td></tr><tr><td>5</td><td>6</td><td>9.72</td><td>455.17</td></tr><tr><td>6</td><td>2</td><td>8.90</td><td>532.12</td></tr><tr><td>2</td><td>Depot</td><td>—</td><td>588.58</td></tr><tr><td>Total</td><td></td><td></td><td>69.93</td><td></td></tr></table>	Vehicle, $k$	From $i$	To $j$	$q_j/f_j$	$T_{jk}$	3	Depot	3	11.18	182.40	3	8	7.07	270	8	2	8.90	347.68	2	7	7.61	453.43	7	Depot	—	548.47	Total			34.76		4	Depot	10	8.87	140.52	10	9	12.65	199.35	9	6	9.72	270	6	8	7.07	367.24	8	7	7.61	476.54	7	Depot	—	571.59	Total			45.92		5	Depot	1	14.61	75.17	1	10	8.87	183.47	10	4	16.40	270	4	5	11.43	356.22	5	6	9.72	455.17	6	2	8.90	532.12	2	Depot	—	588.58	Total			69.93		<p><b>Q1:</b> What is the <math>T_{jk}</math> value for 3 vehicles (<math>k = 3</math>) from <math>i = \text{Depot}</math> to <math>j=3</math>?</p> <p><b>A1:</b> 182.4</p> <p><b>Q2:</b> What is the total <math>q_{-j}/f_{-j}</math> for 5 vehicles (<math>k = 5</math>)?</p> <p><b>A2:</b> 69.93</p>
Vehicle, $k$	From $i$	To $j$	$q_j/f_j$	$T_{jk}$																																																																																												
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Image	Questions and Answers																																																																
<p>TABLE 10.2: Typical combinations of control methods in conjunction with the various invasive species management stages.</p> <table><tr><th>Control Method</th><th>Small Eradication</th><th>Large Eradication</th><th>Small Containment</th><th>Large Containment</th><th>Long-Term Management</th></tr><tr><td>Biological</td><td>0</td><td>0</td><td>0</td><td>1</td><td>1</td></tr><tr><td>Burning</td><td>0</td><td>1</td><td>1</td><td>1</td><td>0</td></tr><tr><td>Chemical</td><td>1</td><td>1</td><td>1</td><td>0</td><td>0</td></tr><tr><td>Cultural</td><td>0</td><td>0</td><td>0</td><td>1</td><td>1</td></tr><tr><td>Manual</td><td>1</td><td>1</td><td>0</td><td>0</td><td>0</td></tr><tr><td>Mechanical</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td></tr></table>	Control Method	Small Eradication	Large Eradication	Small Containment	Large Containment	Long-Term Management	Biological	0	0	0	1	1	Burning	0	1	1	1	0	Chemical	1	1	1	0	0	Cultural	0	0	0	1	1	Manual	1	1	0	0	0	Mechanical	1	1	1	1	1	<p>Q1: What is the value for Biological control method with small eradication?</p> <p>A1: 0</p> <p>Q2: Which control method has only “1” values?</p> <p>A2: Mechanical</p>																						
Control Method	Small Eradication	Large Eradication	Small Containment	Large Containment	Long-Term Management																																																												
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<p>TABLE 2.2: Advantages and disadvantages of different optimisation methods.</p> <table><tr><th>Group</th><th>Method</th><th>Advantages</th><th>Disadvantages</th></tr><tr><td>Exact methods</td><td>Newton's method Gradient-based methods Branch-and-bound method Branch-and-cut method Dynamic programming</td><td>Optimality is guaranteed</td><td>Computational cost can be significant</td></tr><tr><td>Heuristic methods</td><td>Any problem-specific rule-of-thumb method</td><td>Quickly obtain an acceptable solution</td><td>Optimality is not guaranteed</td></tr><tr><td>Metaheuristic methods</td><td>Tabu search Genetic algorithms Ant colony optimisation Particle swarm optimisation Greedy randomised adaptive search procedure</td><td>Are suitable for large problems;Are not problem-specific</td><td>Optimality is not guaranteed; Computational cost can be higher than for heuristic methods.</td></tr></table>	Group	Method	Advantages	Disadvantages	Exact methods	Newton's method Gradient-based methods Branch-and-bound method Branch-and-cut method Dynamic programming	Optimality is guaranteed	Computational cost can be significant	Heuristic methods	Any problem-specific rule-of-thumb method	Quickly obtain an acceptable solution	Optimality is not guaranteed	Metaheuristic methods	Tabu search Genetic algorithms Ant colony optimisation Particle swarm optimisation Greedy randomised adaptive search procedure	Are suitable for large problems;Are not problem-specific	Optimality is not guaranteed; Computational cost can be higher than for heuristic methods.	<p>Q1: What method(s) does the Exact methods group include?</p> <p>A1: Newtons method, Gradient-based-, Branch-and-bound-, Branch-and-cut-, Dynamic programming</p> <p>Q2: What is the advantage(s) of Metaheuristic methods?</p> <p>A2: Are suitable for large problems; Are not problem specific</p>																																																
Group	Method	Advantages	Disadvantages																																																														
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<p>TABLE 8.4: An Example of natural gas consumption by a station containing six compressors which has to compress 70 MMSCMD of natural gas, with each compressor having experienced a different number weeks running.</p> <table><tr><th></th><th colspan="6">Compressor</th><th></th></tr><tr><th></th><th>1</th><th>2</th><th>3</th><th>4</th><th>5</th><th>6</th><th>Total</th></tr><tr><td>Running weeks</td><td>1</td><td>5</td><td>10</td><td>15</td><td>20</td><td>30</td><td></td></tr><tr><td>Consumption (kg/s)</td><td>0.393</td><td>0.393</td><td>0.394</td><td>0.394</td><td>0.394</td><td>0.395</td><td>2.363</td></tr></table>		Compressor								1	2	3	4	5	6	Total	Running weeks	1	5	10	15	20	30		Consumption (kg/s)	0.393	0.393	0.394	0.394	0.394	0.395	2.363	<p>Q1: What is is the Consumption (kg/s) for compressor 1 with running week of 1?</p> <p>A1: 0.393</p> <p>Q2: What is the Total Consumption (kg/s)?</p> <p>A2: 2.363</p>																																
	Compressor																																																																
	1	2	3	4	5	6	Total																																																										
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Consumption (kg/s)	0.393	0.393	0.394	0.394	0.394	0.395	2.363																																																										
<p>TABLE 2.1: The sequential steps followed when applying Algorithm 2.1 to the weighted graph <math>G_3</math> in Figure 2.4, when <math>x = v_1</math>. In each ordered pair, the first entry represents the label <math>l</math> of the vertex in the column heading, whereas the second entry represents the parent of the vertex in the column heading within a current shortest path from <math>v_1</math> to that specific vertex [73].</p> <table><tr><th><math>v_1</math></th><th><math>v_2</math></th><th><math>v_3</math></th><th><math>v_4</math></th><th><math>v_5</math></th><th><math>v_6</math></th><th><math>v_7</math></th><th><math>S</math></th></tr><tr><td><math>(0, v_1)</math></td><td><math>(\infty, -)</math></td><td><math>(\infty, -)</math></td><td><math>(\infty, -)</math></td><td><math>(\infty, -)</math></td><td><math>(\infty, -)</math></td><td><math>(\infty, -)</math></td><td><math>\{v_1, v_2, v_3, v_4, v_5, v_6, v_7\}</math></td></tr><tr><td>—</td><td><math>(2, v_1)</math></td><td><math>(\infty, -)</math></td><td><math>(2, v_1)</math></td><td><math>(\infty, -)</math></td><td><math>(\infty, -)</math></td><td><math>(\infty, -)</math></td><td><math>\{v_2, v_3, v_4, v_5, v_6, v_7\}</math></td></tr><tr><td>—</td><td>—</td><td><math>(6, v_2)</math></td><td><math>(2, v_1)</math></td><td><math>(5, v_2)</math></td><td><math>(\infty, -)</math></td><td><math>(\infty, -)</math></td><td><math>\{v_3, v_4, v_5, v_6, v_7\}</math></td></tr><tr><td>—</td><td>—</td><td><math>(6, v_2)</math></td><td>—</td><td><math>(4, v_4)</math></td><td><math>(8, v_4)</math></td><td><math>(11, v_4)</math></td><td><math>\{v_3, v_5, v_6, v_7\}</math></td></tr><tr><td>—</td><td>—</td><td><math>(6, v_2)</math></td><td>—</td><td>—</td><td><math>(6, v_5)</math></td><td><math>(11, v_4)</math></td><td><math>\{v_3, v_6, v_7\}</math></td></tr><tr><td>—</td><td>—</td><td>—</td><td>—</td><td>—</td><td><math>(6, v_5)</math></td><td><math>(11, v_4)</math></td><td><math>\{v_6, v_7\}</math></td></tr><tr><td>—</td><td>—</td><td>—</td><td>—</td><td>—</td><td>—</td><td><math>(7, v_6)</math></td><td><math>\{v_7\}</math></td></tr></table>	$v_1$	$v_2$	$v_3$	$v_4$	$v_5$	$v_6$	$v_7$	$S$	$(0, v_1)$	$(\infty, -)$	$(\infty, -)$	$(\infty, -)$	$(\infty, -)$	$(\infty, -)$	$(\infty, -)$	$\{v_1, v_2, v_3, v_4, v_5, v_6, v_7\}$	—	$(2, v_1)$	$(\infty, -)$	$(2, v_1)$	$(\infty, -)$	$(\infty, -)$	$(\infty, -)$	$\{v_2, v_3, v_4, v_5, v_6, v_7\}$	—	—	$(6, v_2)$	$(2, v_1)$	$(5, v_2)$	$(\infty, -)$	$(\infty, -)$	$\{v_3, v_4, v_5, v_6, v_7\}$	—	—	$(6, v_2)$	—	$(4, v_4)$	$(8, v_4)$	$(11, v_4)$	$\{v_3, v_5, v_6, v_7\}$	—	—	$(6, v_2)$	—	—	$(6, v_5)$	$(11, v_4)$	$\{v_3, v_6, v_7\}$	—	—	—	—	—	$(6, v_5)$	$(11, v_4)$	$\{v_6, v_7\}$	—	—	—	—	—	—	$(7, v_6)$	$\{v_7\}$	<p>Q1: What is the coordinates assoociated with v1?</p> <p>A1: (0,v1)</p> <p>Q2: What is S for v6=(6,v5)?</p> <p>A2: {v3, v6. v7}</p>
$v_1$	$v_2$	$v_3$	$v_4$	$v_5$	$v_6$	$v_7$	$S$																																																										
$(0, v_1)$	$(\infty, -)$	$(\infty, -)$	$(\infty, -)$	$(\infty, -)$	$(\infty, -)$	$(\infty, -)$	$\{v_1, v_2, v_3, v_4, v_5, v_6, v_7\}$																																																										
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Image	Questions and Answers																									
<p>TABLE 7.20: The objective function evaluation and associated frequencies for the extremal solutions A and B in Figure 7.22, returned by the NSGA II when solving the UTFSP instance in Figure 7.19.</p> <table><tr><th>Extreme solutions</th><th>AETT</th><th>TBR</th><th>Frequencies for routes</th></tr><tr><td>Solution A</td><td>15.507 min</td><td>23.619 buses</td><td><math>\{\frac{1}{30}, \frac{1}{30}, \frac{1}{30}, \frac{1}{30}, \frac{1}{30}, \frac{1}{30}\}</math></td></tr><tr><td>Solution B</td><td>32.068 min</td><td>4.2 buses</td><td><math>\{\frac{1}{30}, \frac{1}{30}, \frac{1}{30}, \frac{1}{30}, \frac{1}{30}, \frac{1}{30}\}</math></td></tr></table>	Extreme solutions	AETT	TBR	Frequencies for routes	Solution A	15.507 min	23.619 buses	$\{\frac{1}{30}, \frac{1}{30}, \frac{1}{30}, \frac{1}{30}, \frac{1}{30}, \frac{1}{30}\}$	Solution B	32.068 min	4.2 buses	$\{\frac{1}{30}, \frac{1}{30}, \frac{1}{30}, \frac{1}{30}, \frac{1}{30}, \frac{1}{30}\}$	<p><b>Q1:</b> What is the AETT for solution A?</p> <p><b>A1:</b> 15.507 min</p> <p><b>Q2:</b> Liist the frequeuncies for routes of So- lution B.</p> <p><b>A2:</b> {1/30, 1/30, 1/30, 1/30, 1/30, 1/30}</p>													
Extreme solutions	AETT	TBR	Frequencies for routes																							
Solution A	15.507 min	23.619 buses	$\{\frac{1}{30}, \frac{1}{30}, \frac{1}{30}, \frac{1}{30}, \frac{1}{30}, \frac{1}{30}\}$																							
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<p>Table 3: Notifications of IFD in Tasmania by age group, serotype included in a vaccine and medical risk factors, 1 January to 31 December 2016</p> <table><tr><th>Age group</th><th>Total notifications</th><th>Cases notified with a serotype included in a vaccine<sup>a</sup></th><th>Medically at risk<sup>b</sup></th><th>No risk factor trialified</th></tr><tr><td>&lt;5</td><td>5</td><td>3</td><td>1</td><td>2</td></tr><tr><td>5 to 64</td><td>21</td><td>7</td><td>14</td><td>3</td></tr><tr><td>65+</td><td>24</td><td>13</td><td>21</td><td>3</td></tr><tr><td>Total</td><td>50</td><td>23</td><td>36</td><td>8</td></tr></table>	Age group	Total notifications	Cases notified with a serotype included in a vaccine <sup>a</sup>	Medically at risk <sup>b</sup>	No risk factor trialified	<5	5	3	1	2	5 to 64	21	7	14	3	65+	24	13	21	3	Total	50	23	36	8	<p><b>Q1:</b> What is the Total notifications for Age group 5?</p> <p><b>A1:</b> 5</p> <p><b>Q2:</b> What is the total notifications?</p> <p><b>A2:</b> 50</p>
Age group	Total notifications	Cases notified with a serotype included in a vaccine <sup>a</sup>	Medically at risk <sup>b</sup>	No risk factor trialified																						
<5	5	3	1	2																						
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<p>TABLE 5.3: Attribute table for the packing facility agent population</p> <table><tr><th>ID</th><th>Latitude</th><th>Longitude</th><th>Category</th><th>Capacity</th></tr><tr><td>P1</td><td>-32.685841</td><td>19.053152</td><td>S</td><td>690</td></tr><tr><td>P2</td><td>-34.038879</td><td>20.543893</td><td>S</td><td>690</td></tr><tr><td>P3</td><td>-32.493941</td><td>18.570871</td><td>XS</td><td>69</td></tr></table>	ID	Latitude	Longitude	Category	Capacity	P1	-32.685841	19.053152	S	690	P2	-34.038879	20.543893	S	690	P3	-32.493941	18.570871	XS	69	<p><b>Q1:</b> What is the latitude for P1?</p> <p><b>A1:</b> -32.685841</p> <p><b>Q2:</b> What is the Capacity for P3 with category of XS?</p> <p><b>A2:</b> 69</p>					
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## Image

Grade 6 Mathematics		2015 – 2016
Week	Major Concepts / Topics	Possible Resources
1	<ul style="list-style-type: none"> <li>Module 7 – Applying Rates and Ratios – Lesson 7.1 – Ratios, Tables and Graphs</li> <li>Lesson 7.2 – Solving Problems with Proportions</li> </ul>	Lesson 7.1 and 7.2 – <a href="#">Khan Academy</a>
2	<ul style="list-style-type: none"> <li>Module 7 – Applying Rates and Ratios – Lesson 7.3 – Converting within Measurement Systems</li> <li>Lesson 7.4 – Converting Between Measurement Systems</li> <li>Assessment</li> </ul>	Lesson 7.3 and 7.4 – <a href="#">Khan Academy</a>
3	<ul style="list-style-type: none"> <li>Module 8 – Percents – Lesson 8.1 – Understanding Percent</li> <li>Lesson 8.2 – Percents, Fractions, and Decimals</li> </ul>	Lesson 8.1 – <a href="#">Khan Academy</a> Lesson 8.2 – <a href="#">Khan Academy</a>
4	<ul style="list-style-type: none"> <li>Module 8 – Percents – Lesson 8.3 – Solving Percent Problems</li> <li>Assessment</li> </ul>	Lesson 8.3 – <a href="#">Khan Academy</a>
5	<ul style="list-style-type: none"> <li>Module 9 – Generating Equivalent Numerical Expressions – Lesson 9.1 – Exponents</li> <li>Lesson 9.3 – Order of Operations</li> <li>Assessment</li> </ul>	Lesson 9.1 and 9.3 – <a href="#">Khan Academy</a>
6	<ul style="list-style-type: none"> <li>Module 10 – Generating Equivalent Algebraic Expressions – Lesson 10.1 – Modeling and Writing Expressions</li> <li>Lesson 10.2 – Evaluating Expressions</li> </ul>	Lesson 10.1 – <a href="#">Khan Academy</a> Lesson 10.2 – <a href="#">Khan Academy</a>
7	<ul style="list-style-type: none"> <li>Module 10 – Generating Equivalent Algebraic Expressions – Lesson 10.3 – Generating Equivalent Expressions</li> <li>Assessment</li> </ul>	Lesson 10.3 – <a href="#">Khan Academy</a>
8	<ul style="list-style-type: none"> <li>Module 11 – Equations and Relationships – 11.1 Writing Equations to Represent Situations</li> </ul>	Lesson 11.1 – <a href="#">Khan Academy</a>
9	<ul style="list-style-type: none"> <li>Module 11 – Equations and Relationships – 11.2 – Addition and Subtraction Equations</li> <li>Semester Assessment</li> </ul>	Lesson 11.2 – <a href="#">Khan Academy</a>

## Questions and Answers

**Q1:** What is the Major Concepts/Topics of Week 1?

**A1:** Module 7 - Applying Rates and Ratios - Lesson 7.1 - Ratios, Tables and graphs. Lesson 7.2 - Solving Problems with Proportions

**Q2:** In what week(s) is Module 8 covered?

**A2:** Week 3 and 4

Vocational Pathway	Number of Awards	% of VP Awards
Construction and Infrastructure	1,014	5.7%
Primary Industries	1,088	6.2%
Manufacturing and Technology	786	4.4%
Service Industries	2,498	14.2%
Social and Community Services	488	2.8%
Creative Industries	11,790	66.7%
Total Vocational Pathway Awards	17,664	100%

**Q1:** What is the number of awards for the “Construction and Infrastructure” Vocational Pathway?

**A1:** 1,014

**Q2:** What is the % of VP Awards for Service Industries?

**A2:** 14.20%