

## Tables with Associated Questions and Answers

Table				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><b>Q1:</b> What is the Section name?</p> <p><b>A1:</b> 7 Appendix B: Product Behavior</p> <p><b>Q2:</b> Is there a major change?</p> <p><b>A2:</b> Y</p>		
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Average	0.91	0.91																							

Table

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

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

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

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<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="6">Residential</th><th colspan="6">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>									
Land-use	Residential						Non-residential																																										
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## Table

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
...	...	...	...	...	...	...	...	...
30488	FOODS_3.823_WI.3	0	6	0	...	0	1	0
30489	FOODS_3.824_WI.3	0	0	0	...	3	1	3
30490	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: mean; attr: slope, chunk.len: 5, f.agg: var; attr: stderr, chunk.len: 10, 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

**Q1:** What is the Reature name of Feature number 1?

**A1:** agg\_autocorrelation

**Q2:** What is the feature parameteres of the aproximate\_entropy?

**A2:** m: 2, r: 0.7

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)
Level 12	Product.store	30490	S/N: 0.541 % zeros: 68.00	S/N: 0.996 % zeros: 39.88	S/N: 1.306 % zeros: 29.75	S/N: 1.574 % zeros: 23.62
Level 11	Product.state	9147	S/N: 0.541 % zeros: 45.41	S/N: 0.996 % zeros: 26.67	S/N: 1.306 % zeros: 22.89	S/N: 1.574 % zeros: 19.12
Level 10	Product	3049	S/N: 1.194 % zeros: 29.35	S/N: 1.763 % zeros: 21.99	S/N: 1.965 % zeros: 19.78	S/N: 2.249 % zeros: 17.24
Level 9	Store.department	70	S/N: 3.519 % zeros: 0.27	S/N: 5.104 % zeros: 0	S/N: 4.657 % zeros: 0	S/N: 4.959 % zeros: 0
Level 8	State.department	21	S/N: 3.937 % zeros: 0.17	S/N: 5.607 % zeros: 0	S/N: 4.994 % zeros: 0	S/N: 5.296 % zeros: 0
Level 7	Department	7	S/N: 4.241 % zeros: 0.16	S/N: 5.754 % zeros: 0	S/N: 5.118 % zeros: 0	S/N: 5.410 % zeros: 0
Level 6	Category	3	S/N: 4.42 % zeros: 0.12	S/N: 6.462 % zeros: 0	S/N: 5.503 % zeros: 0	S/N: 5.755 % zeros: 0
Level 5	State	3	S/N: 4.42 % zeros: 0	S/N: 6.462 % zeros: 0	S/N: 5.503 % zeros: 0	S/N: 5.755 % zeros: 0
Level 4	State	3	S/N: 4.42 % zeros: 0	S/N: 6.462 % zeros: 0	S/N: 5.503 % zeros: 0	S/N: 5.755 % zeros: 0
Level 3	State	3	S/N: 4.42 % zeros: 0	S/N: 6.462 % zeros: 0	S/N: 5.503 % zeros: 0	S/N: 5.755 % zeros: 0
Level 2	State	3	S/N: 4.42 % zeros: 0	S/N: 6.462 % zeros: 0	S/N: 5.503 % zeros: 0	S/N: 5.755 % zeros: 0
Level 1	Total	1	S/N: 4.42 % zeros: 0	S/N: 6.462 % zeros: 0	S/N: 5.503 % zeros: 0	S/N: 5.755 % zeros: 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

Table	Questions and Answers																																																																																															
<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 rowspan="4">Machine learning</td><td>Kalman filter</td><td>✓</td><td>✓</td><td>✓</td></tr><tr><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 rowspan="4">Intermittent</td><td>Transformers</td><td>✓</td><td>✓</td><td>✓</td></tr><tr><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	✓	✓	✓	Machine learning	Kalman filter	✓	✓	✓	Feedforward NNs	✓	✓	✓	RNNs	✓	✓	✓	CNNs	✓	✓	✓	Intermittent	Transformers	✓	✓	✓	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>																										
Domain	Model	Univariate	Multivariate	Probabilistic																																																																																												
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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>																																																																		
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				Demand stability index																																																																																												
<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>																																																																																		
			Actual class																																																																																													
		+	−																																																																																													
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	−	False Negative (FN)	True Negative (TN)																																																																																													
<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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Table	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><b>Q1:</b> What is the value for Biological control method with small eradication?</p> <p><b>A1:</b> 0</p> <p><b>Q2:</b> Which control method has only “1” values?</p> <p><b>A2:</b> Mechanical</p>																						
Control Method	Small Eradication	Large Eradication	Small Containment	Large Containment	Long-Term Management																																																												
Biological	0	0	0	1	1																																																												
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Mechanical	1	1	1	1	1																																																												
<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><b>Q1:</b> What method(s) does the Exact methods group include?</p> <p><b>A1:</b> Newtons method, Gradient-based-, Branch-and-bound-, Branch-and-cut-, Dynamic programming</p> <p><b>Q2:</b> What is the advantage(s) of Metaheuristic methods?</p> <p><b>A2:</b> Are suitable for large problems; Are not sproblem specific</p>																																																
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																																																														
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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>Running weeks</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>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							Running weeks	1	2	3	4	5	6	Total	Consumption (kg/s)	0.393	0.393	0.394	0.394	0.394	0.395	2.363	<p><b>Q1:</b> What is is the Consumption (kg/s) for compressor 1 with running week of 1?</p> <p><b>A1:</b> 0.393</p> <p><b>Q2:</b> What is the Total Consumption (kg/s)?</p> <p><b>A2:</b> 2.363</p>																																								
	Compressor																																																																
Running weeks	1	2	3	4	5	6	Total																																																										
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><b>Q1:</b> What is the coordinates assoociated with v1?</p> <p><b>A1:</b> (0,v1)</p> <p><b>Q2:</b> What is S for v6=(6,v5)?</p> <p><b>A2:</b> {v3, v6. v7}</p>
$v_1$	$v_2$	$v_3$	$v_4$	$v_5$	$v_6$	$v_7$	$S$																																																										
$(0, v_1)$	$(\infty, -)$	$(\infty, -)$	$(\infty, -)$	$(\infty, -)$	$(\infty, -)$	$(\infty, -)$	$\{v_1, v_2, v_3, v_4, v_5, v_6, v_7\}$																																																										
—	$(2, v_1)$	$(\infty, -)$	$(2, v_1)$	$(\infty, -)$	$(\infty, -)$	$(\infty, -)$	$\{v_2, v_3, v_4, v_5, v_6, v_7\}$																																																										
—	—	$(6, v_2)$	$(2, v_1)$	$(5, v_2)$	$(\infty, -)$	$(\infty, -)$	$\{v_3, v_4, v_5, v_6, v_7\}$																																																										
—	—	$(6, v_2)$	—	$(4, v_4)$	$(8, v_4)$	$(11, v_4)$	$\{v_3, v_5, v_6, v_7\}$																																																										
—	—	$(6, v_2)$	—	—	$(6, v_5)$	$(11, v_4)$	$\{v_3, v_6, v_7\}$																																																										
—	—	—	—	—	$(6, v_5)$	$(11, v_4)$	$\{v_6, v_7\}$																																																										
—	—	—	—	—	—	$(7, v_6)$	$\{v_7\}$																																																										



Table	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 frequencies 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																							
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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>a</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>a</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 j5?</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>a</sup>	No risk factor trialified																						
<5	5	3	1	2																						
5 to 64	21	7	14	3																						
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<table><tr><td colspan="3"><b>Working better together</b><ul style="list-style-type: none"><li>Improve innovate and reform practices to provide better services to clients</li><li>Support our people</li><li>Engage externally for accountability and transparency</li><li>Use evidence and experience to improve legal services delivery</li></ul></td></tr><tr><td><b>Outcome / output 2016-17</b></td><td><b>Measure / indicator</b></td><td><b>Activities</b></td></tr><tr><td>Flexible technology adopted by staff delivering client services across the state</td><td><ul style="list-style-type: none"><li>All staff across VLA are effectively using new Surface Pro tablets and Skype for business</li><li>Stable and reliable network performance for regional and mobile staff</li></ul></td><td><ul style="list-style-type: none"><li>Rollout of Surface Pro tablets and implementation of Skype for Business across the state</li><li>Undertake a change management program to ensure staff are effectively supported and trained and adopting mobile lawyering</li><li>Review and upgrade infrastructure services</li><li>Work with magistrates' and other courts to increase VLA staff access to their Wi-Fi networks</li></ul></td></tr></table>	<b>Working better together</b> <ul style="list-style-type: none"><li>Improve innovate and reform practices to provide better services to clients</li><li>Support our people</li><li>Engage externally for accountability and transparency</li><li>Use evidence and experience to improve legal services delivery</li></ul>			<b>Outcome / output 2016-17</b>	<b>Measure / indicator</b>	<b>Activities</b>	Flexible technology adopted by staff delivering client services across the state	<ul style="list-style-type: none"><li>All staff across VLA are effectively using new Surface Pro tablets and Skype for business</li><li>Stable and reliable network performance for regional and mobile staff</li></ul>	<ul style="list-style-type: none"><li>Rollout of Surface Pro tablets and implementation of Skype for Business across the state</li><li>Undertake a change management program to ensure staff are effectively supported and trained and adopting mobile lawyering</li><li>Review and upgrade infrastructure services</li><li>Work with magistrates' and other courts to increase VLA staff access to their Wi-Fi networks</li></ul>	<p><b>Q1:</b> What is Outcome / output 2016-17?</p> <p><b>A1:</b> Flexible technology adopted by staff delivering client services across the state</p> <p><b>Q2:</b> Is “Support our people” listed under Working better together?</p> <p><b>A2:</b> Yes</p>																
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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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P1	-32.685841	19.053152	S	690																						
P2	-34.038879	20.543893	S	690																						
P3	-32.493941	18.570871	XS	69																						

## Table

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>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%