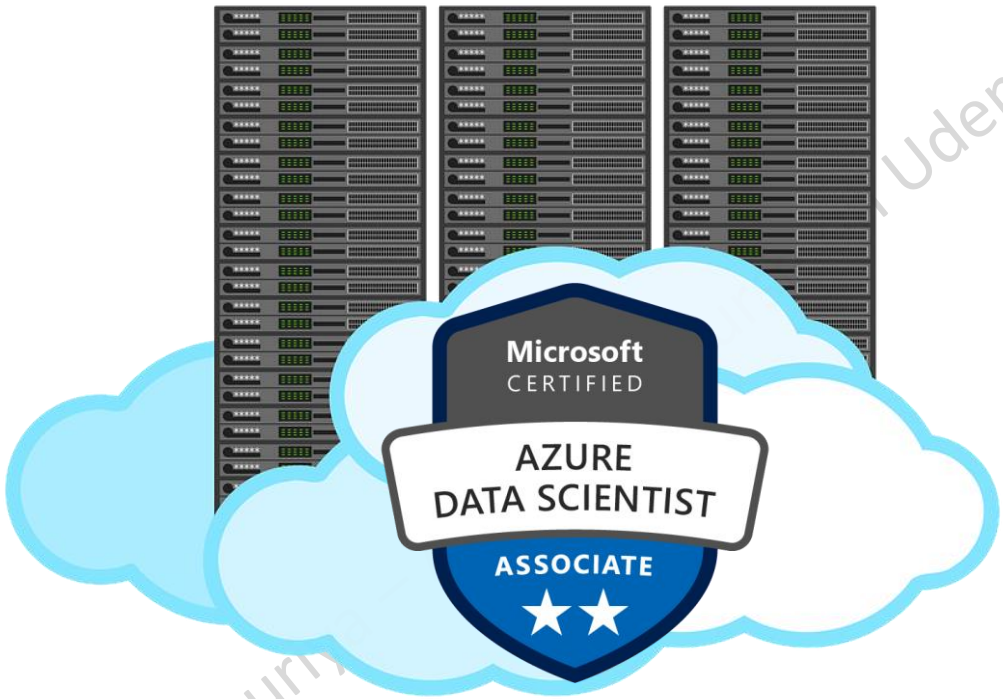
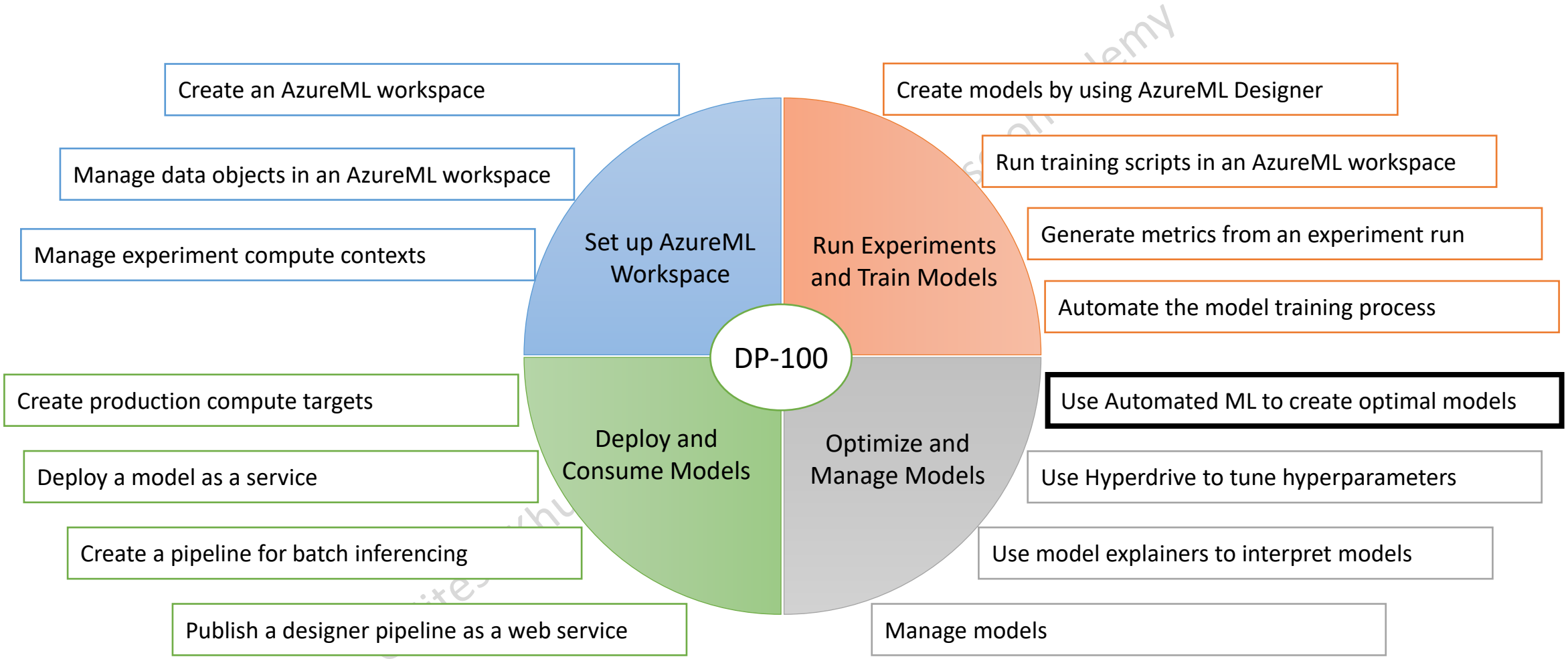
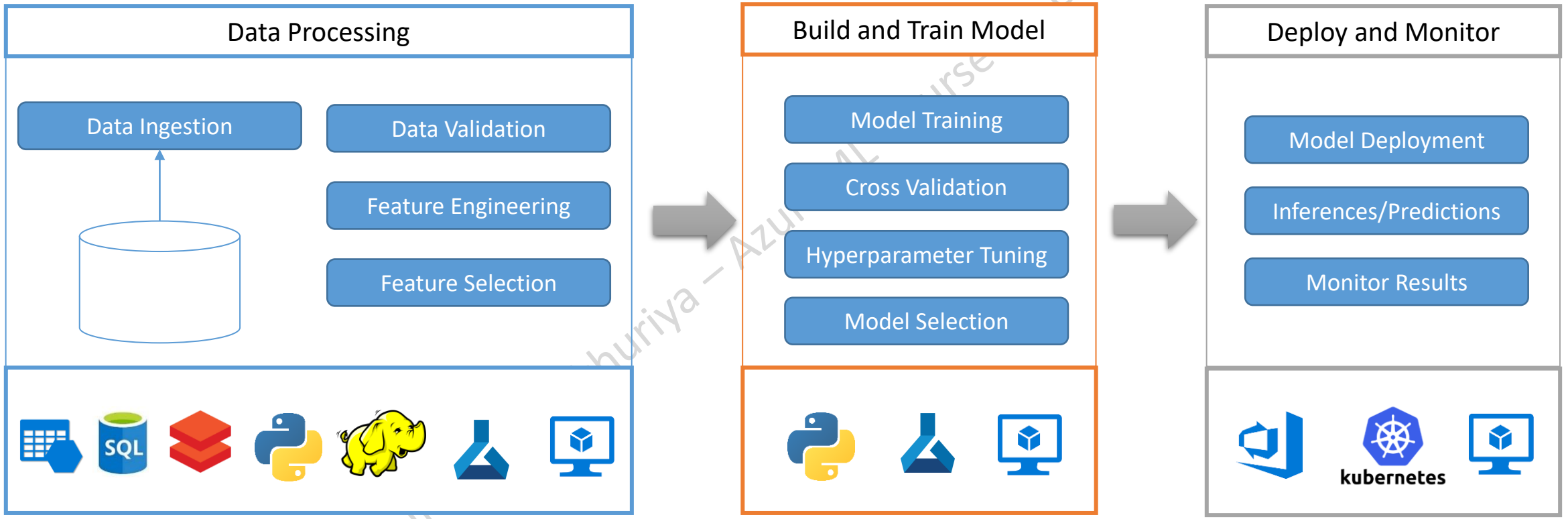


Azure Machine Learning



Typical Machine Learning Workflow



Defaults with multiple models

Finished running

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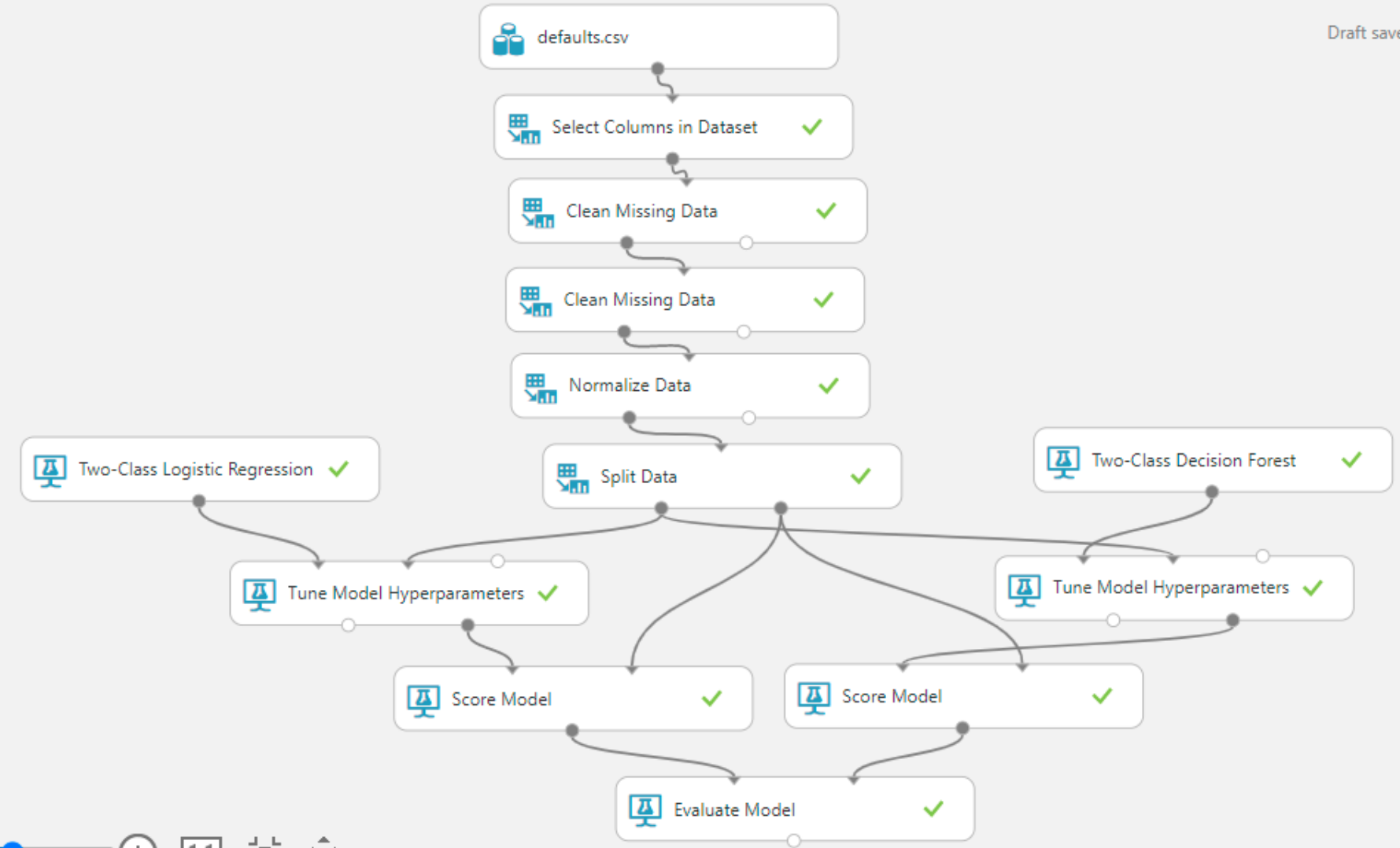
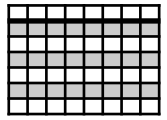


Datasets, Modules, Trained Models, and Transforms

Typical Machine Learning Workflow

Data Processing	Model Building and Selection	Hyperparameter Tuning	Evaluate and Select
• ID • Credit Given • Gender • Education • Marital Status • ….. • Default?	• Logistic Regression • Boosted Decision Tree • Decision/Random Forest • Support Vector Machines • Deep Learning	• L1 and L2 • Tolerance • Number of trees • Max Depth • Splits per node • Min Samples per node	Select Best model based on the goal
• **Which Features to select?** • **How to deal with missing values?**	• **Which Algorithm to Select?**	• **How to tune the parameters?**	• **Compare the goals**

Azure AutoML



Bring Dataset

Define Goal

Constraints

Run 1	Data Processing + Algorithm + Tunning	62%
Run 2	Data Processing + Algorithm + Tunning	82%
Run 3	Data Processing + Algorithm + Tunning	91%
Run 4	Data Processing + Algorithm + Tunning	74%
Run 5	Data Processing + Algorithm + Tunning	92%

Rank	Run	Accuracy
1	Run 5	92%
2	Run 3	91%
3	Run 2	82%
4	Run 4	74%
5	Run 1	62%

Note on norm_micro_recall

Recall

Actual \ Predicted	False	True
False	253	115
True	66	46

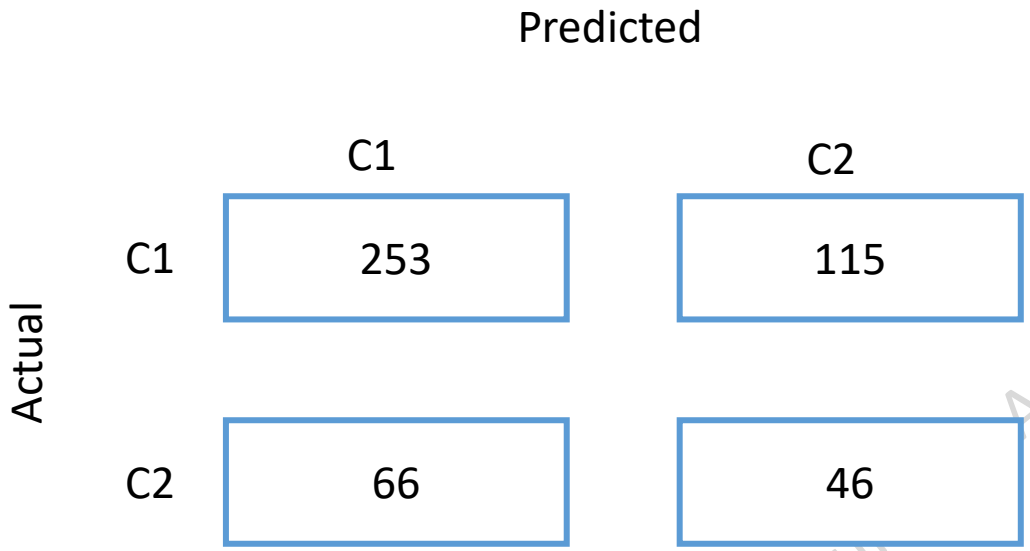
$$Recall = \frac{TP}{TP + FN} = \frac{46}{46 + 66} = 0.4107$$

Recall

Actual \ Predicted	No	Yes
No	253	115
Yes	66	46

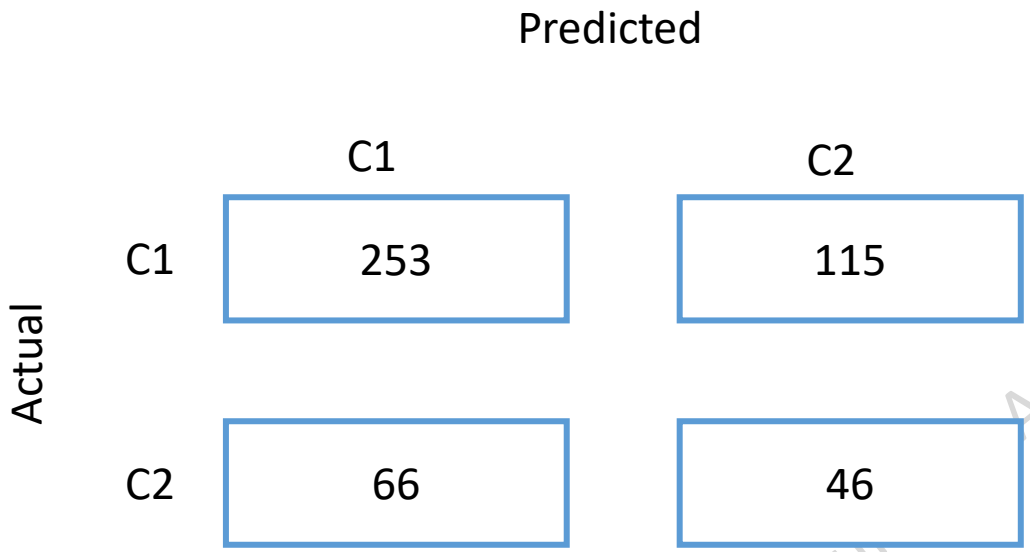
$$Recall = \frac{TP}{TP + FN} = \frac{46}{46 + 66} = 0.4107$$

Recall



$$Recall = \frac{TP}{TP + FN} = \frac{46}{46 + 66} = 0.4107$$

Recall



$$Recall = \frac{Correct\ Predictions\ of\ the\ class}{Total\ Actual\ Observations\ of\ the\ class}$$

$$Recall_{(C2)} = \frac{46}{46 + 66} = 0.4107$$

$$Recall_{(C1)} = \frac{253}{253 + 115} = 0.6875$$

Macro Recall

Actual \ Predicted	C1	C2
C1	253	115
C2	66	46

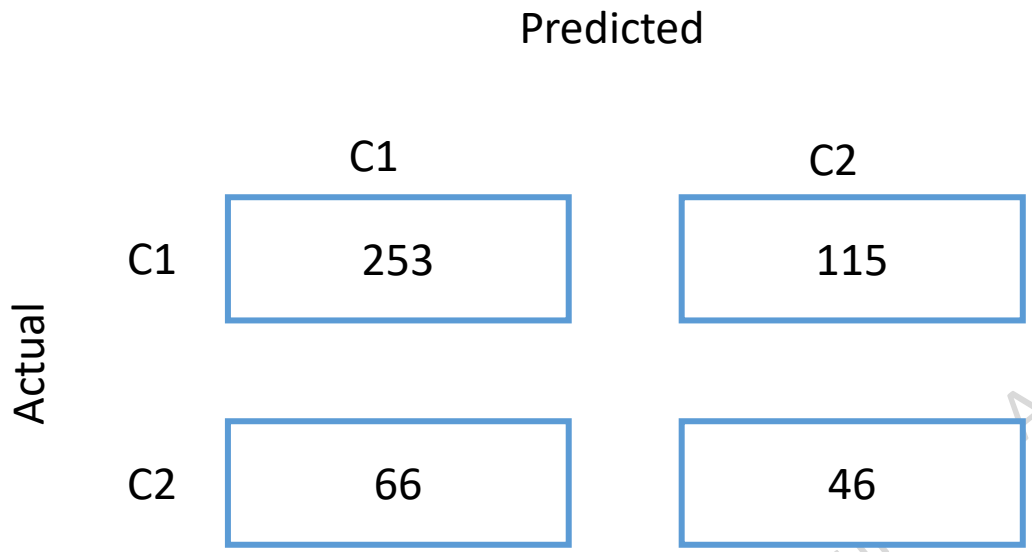
$$Recall = \frac{Correct\ Predictions\ of\ the\ class}{Total\ Actual\ Observations\ of\ the\ class}$$

$$Recall_{(C2)} = \frac{46}{46 + 66} = 0.4107$$

$$Recall_{(C1)} = \frac{253}{253 + 115} = 0.6875$$

$$macro\ recall = \frac{Recall_{C1} + Recall_{C2}}{Number\ of\ classes} = \frac{0.4107 + 0.6875}{2} = 0.5491$$

Normalized Macro Recall



$$Recall = \frac{Correct\ Predictions\ of\ the\ class}{Total\ Actual\ Observations\ of\ the\ class}$$

$$Recall_{(C2)} = \frac{46}{46 + 66} = 0.4107$$

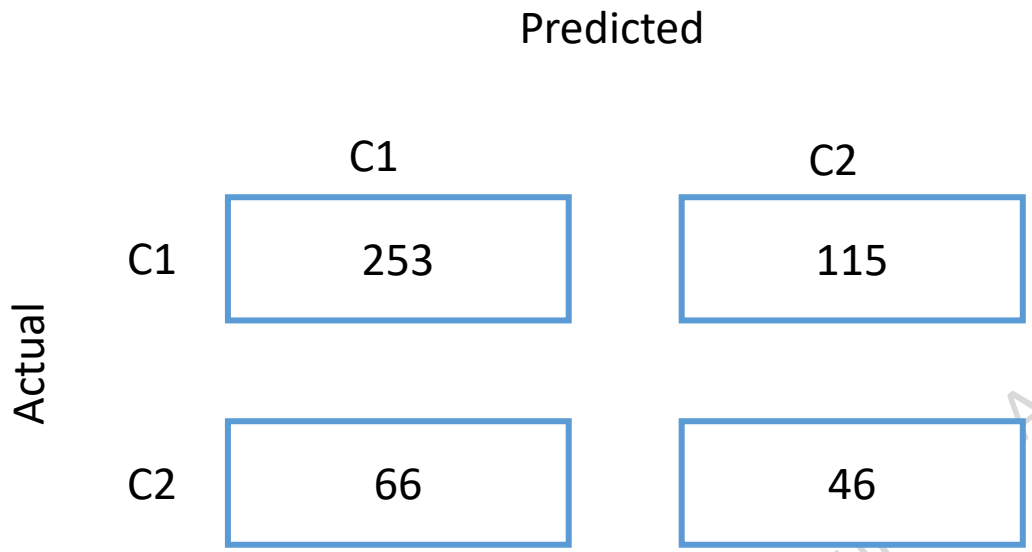
$$Recall_{(C1)} = \frac{253}{253 + 115} = 0.6875$$

$$macro\ recall = 0.5491$$

$$norm\ macro\ recall = \frac{macro\ recall\ - R}{1\ - R}$$

$$R = \frac{1}{C} \qquad C \rightarrow Number\ of\ classes$$

Normalized Macro Recall



$$Recall = \frac{Correct\ Predictions\ of\ the\ class}{Total\ Actual\ Observations\ of\ the\ class}$$

$$Recall_{(C2)} = \frac{46}{46 + 66} = 0.4107$$

$$Recall_{(C1)} = \frac{253}{253 + 115} = 0.6875$$

$$macro\ recall = 0.5491$$

$$norm\ macro\ recall = \frac{macro\ recall\ - R}{1\ - R} = \frac{0.5491\ - 0.5}{1\ - 0.5} = 0.0982$$

Normalized Macro Recall

Actual \ Predicted	C1	C2
C1	368	0
C2	112	0

$$Recall_{(C1)} = \frac{368}{368 + 0} = 1$$

$$Recall_{(C2)} = \frac{0}{0 + 112} = 0$$

$$macro\ recall = 0.5$$

$$norm\ macro\ recall = \frac{0.5 - 0.5}{1 - 0.5} = 0$$

Actual \ Predicted	C1	C2
C1	368	0
C2	0	112

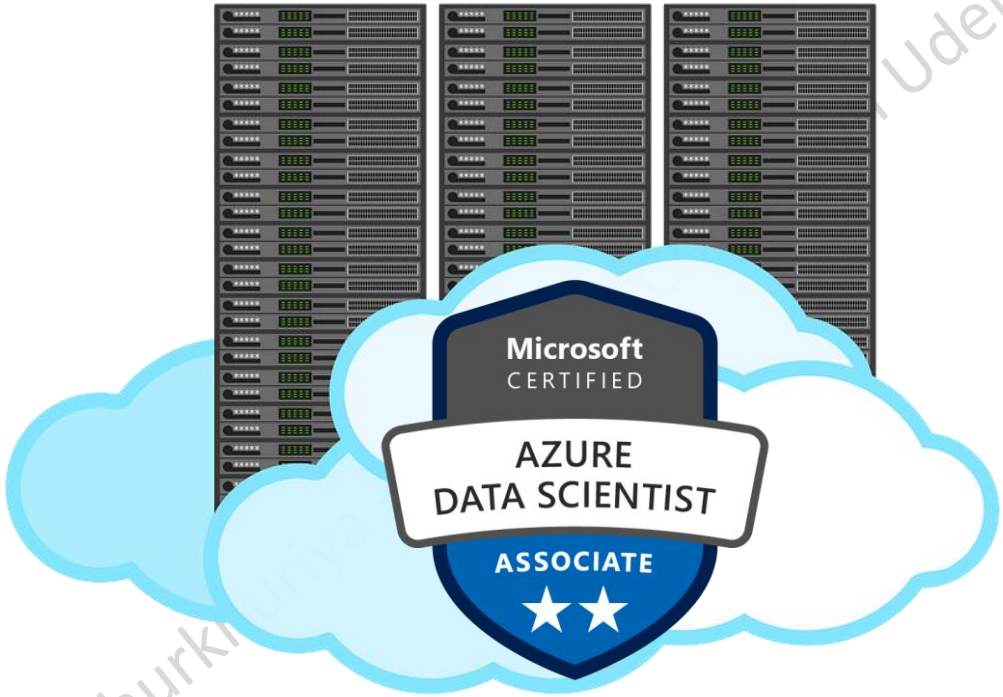
$$Recall_{(C1)} = \frac{368}{368 + 0} = 1$$

$$Recall_{(C2)} = \frac{112}{112 + 0} = 1$$

$$macro\ recall = 1$$

$$norm\ macro\ recall = \frac{1 - 0.5}{1 - 0.5} = 1$$

Azure Machine Learning



Thank You..!!