DAI-003

Capstone Project - Microsoft Data and Artificial Intelligence

MariBisnis

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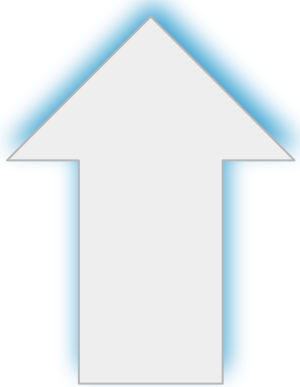
DELIVERABLES

MariBisnis wants to know the business trend of selling homes in Seattle, America.

The goal is that MariBisnis can **predict the price of a house and map out the distribution** of existing data.



Predict the price of a house

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DATASET

However...

The dataset **is not explained and trained well**. So, we need to understand the dataset. This dataset contains house sale prices, including homes sold between **May 2014 and May 2015**.

21 features that need to be explained and processed.

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DATASET

21 features that need to be explained and processed.

Column name	Description	Column name	Description
id	a notation for a house	date	date house was sold
price	price is prediction target	bedrooms	number of bedrooms per house
bathrooms	number of bathrooms per bedrooms	sqft_living	square footage of the home
sqft_lot	square footage of the lot	floors	total floors (levels) in house
waterfront	house which has a view to waterfornt	view	has been viewed
condition	how good the condition is overall	grade	overall grade given to the housing unit, based on the grading system
sqft_above	square footage of house apart from basement	sqft_basement	square footage of the basemenet
yr_built	built year	yr_renovated	year when house was renovated
zipcode	zipcode	lat	latitude coordinate
long	longitude coordinate	sqft_living15	living room area in 2015 (implies-- some renovation), might or might not have affected the lotsize
sqft_lot15	lot size area in 2015 (implies-- some renovations		

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MariBisnis processing steps.

1

Understanding MariBisnis dataset.

2

Create compute clusters and pipeline needed.

3

Create visualization by MariBisnis's insights.

Understanding MariBisnis dataset.

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Dataset details.

Version	v1.0
Properties	Tabular
Size	2,065 Mb
Total rows	21,613 rows
Features	21 Features
Link download	One Drive MariBisnis Dataset

	id	date	price	bedrooms	bathrooms	sqft_living	sqft_lot	floors	waterfront	view
0	7129300520	20141013T000000	221900.0	3	1.00	1180	5650	1.0	0	0
1	6414100192	20141209T000000	538000.0	3	2.25	2570	7242	2.0	0	0
2	5631500400	20150225T000000	180000.0	2	1.00	770	10000	1.0	0	0
3	2487200875	20141209T000000	604000.0	4	3.00	1960	5000	1.0	0	0
4	1954400510	20150218T000000	510000.0	3	2.00	1680	8080	1.0	0	0

view	condition	grade	sqft_above	sqft_basement	yr_built	yr_renovated	zipcode	lat	long	sqft_living15	sqft_lot15
0	3	7	1180	0	1955	0	98178	47.5112	-122.257	1340	5650
0	3	7	2170	400	1951	1991	98125	47.7210	-122.319	1690	7639
0	3	6	770	0	1933	0	98028	47.7379	-122.233	2720	8062
0	5	7	1050	910	1965	0	98136	47.5208	-122.393	1360	5000
0	3	8	1680	0	1987	0	98074	47.6168	-122.045	1800	7503

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Pre-processing dataset.

Name	Dtype	Name	Dtype	Name	Dtype
id	int	floors	int	yr_built	int
date	int	waterfront	int	yr_renovated	int
price	int	view	int	zipcode	int
bedrooms	int	condition	int	lat	float
bathrooms	float	grade	int	long	float
sqft_living	int	sqft_above	int	sqft_living15	int
sqft_lot	int	sqft_basement	int	sqft_lot15	int

Unused Features

Change into categorical features

Change dtype

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Final processing dataset.

Name	Dtype	Name	Dtype	Name	Dtype
price	int	condition	int	sqft_living15	int
bedrooms	int	grade	int	sqft_lot15	int
bathrooms	int	sqft_above	int		
sqft_living	int	sqft_basement	int		
sqft_lot	int	yr_built	int		
floors	int	yr_renovated	int		
waterfront	int	zipcode	int		

Unused Features

Change into categorical features

Change dtype

Create compute clusters and pipeline needed.

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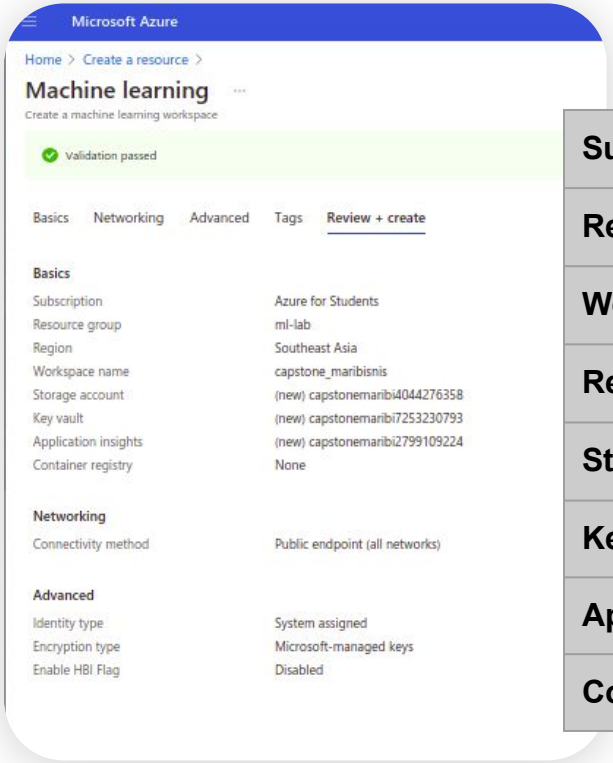
Create Machine Learning Resources.



Subscription	Azure for Students
Resource group	ml-lab
Workspace name	capstone-maribisnis
Region	Southeast Asia
Storage account	capstonemaribi4044276358
Key vault	capstonemaribi7253230793
Application insights	capstonemaribi2799109224
Container registry	None

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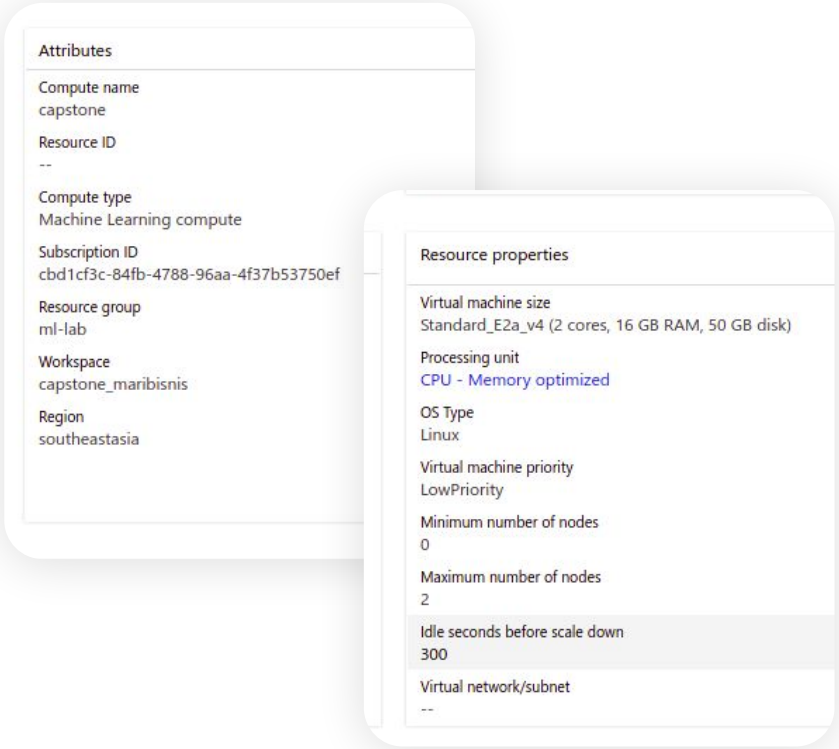
Create Compute Clusters Resources.



Location	Southeast Asia
Virtual Machine priority	Low priority
Virtual Machine type	CPU
Virtual Machine size	Standard_E2a_v4
Compute name	capstone
Min number of nodes	0
Max number of nodes	2
Idle seconds before scale down	300s
Enable SSH access	Unselected

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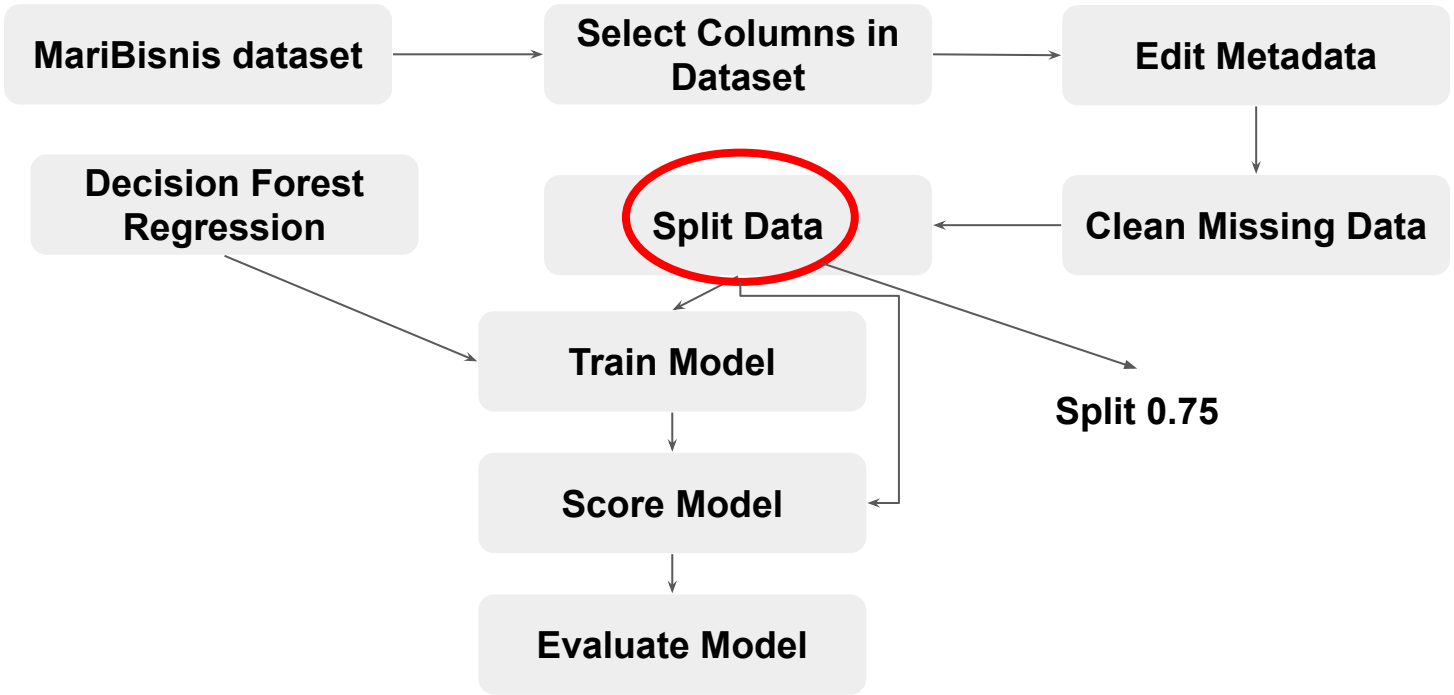
Auto Training House Pricing.



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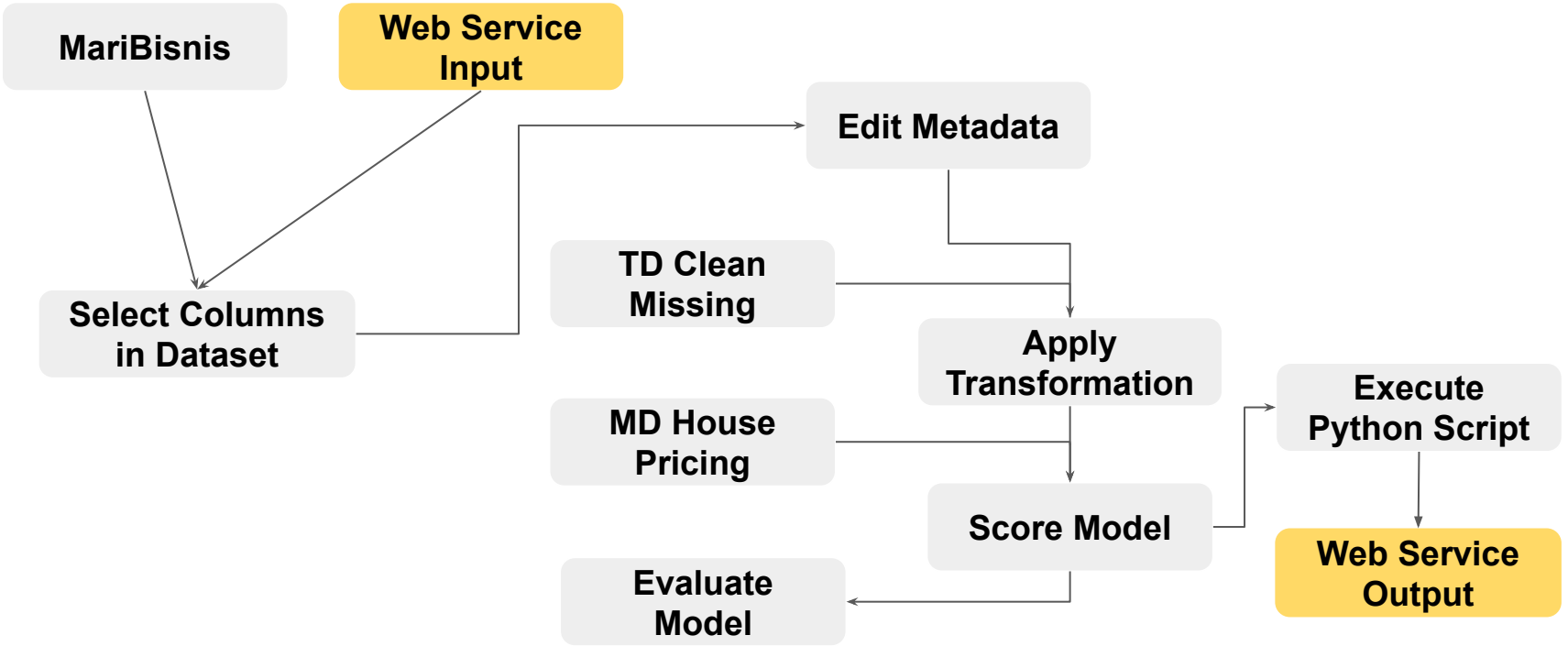
Auto Training House Pricing Pipeline - real time interface.



Python Script - Pipeline

```
import pandas as pd

def azureml_main(dataframe1 = None, dataframe2 = None):

    scored_results = dataframe1[['Scored Labels']]
    scored_results.rename(columns={'Scored Labels':'predicted_price'},
                          inplace=True)
    return scored_results
```

Evaluate Model - Decision Forest Regression

MAE	52340.56594
RMSE	98575.012936
RSE	0.072098 - 7,21%
RAE	0.223733 - 22,37%
R^2	0.927902

represents the mean absolute error between the predicted result and the original result.

represents that the variation in the value produced by a forecast model is close to the variation in the observed value.

a relative metric between 0 and 1 based on the square of the differences between predicted and true values.

a relative metric between 0 and 1 based on the absolute differences between predicted and true values.

represents summarizes how much of the variance between predicted and t values is explained by the model.

Create visualization by MariBisnis's insights.

Correlation House Pricing

```
[ ] data.corr()['price'].sort_values()
```

```
zipcode         -0.053203
long             0.021626
condition        0.036362
yr_built         0.054012
sqft_lot15       0.082447
sqft_lot         0.089661
yr_renovated     0.126434
floors           0.256794
waterfront       0.266369
lat              0.307003
bedrooms         0.308350
sqft_basement    0.323816
view             0.397293
bathrooms        0.525138
sqft_living15    0.585379
sqft_above       0.605567
grade            0.667434
sqft_living      0.702035
price            1.000000
Name: price, dtype: float64
```

From the results above, it can be seen that in addition to `price`, there are `sqft_living`, `grade`, `sqft_above`, `sqft_living15`, and `bathrooms` which are highly correlated with price.

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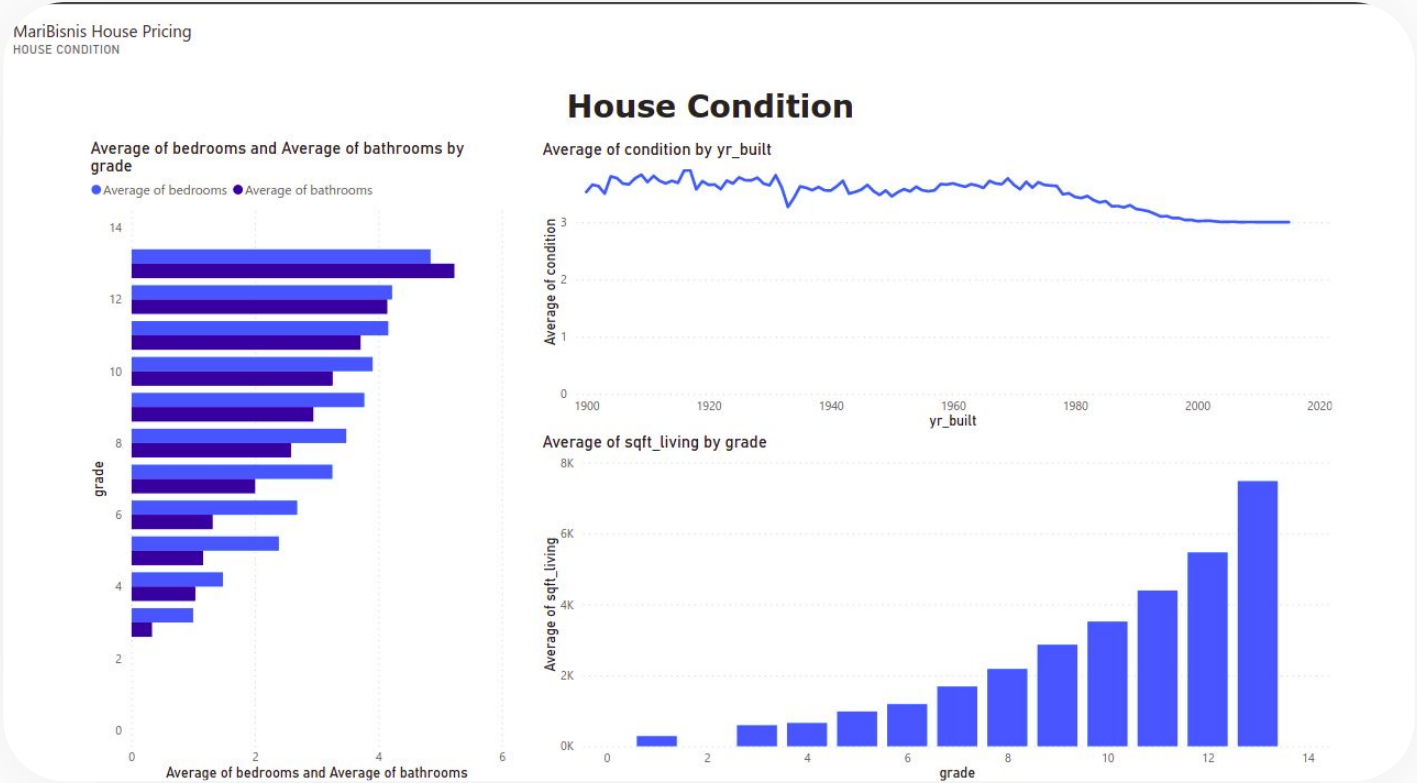
House Condition Visualization



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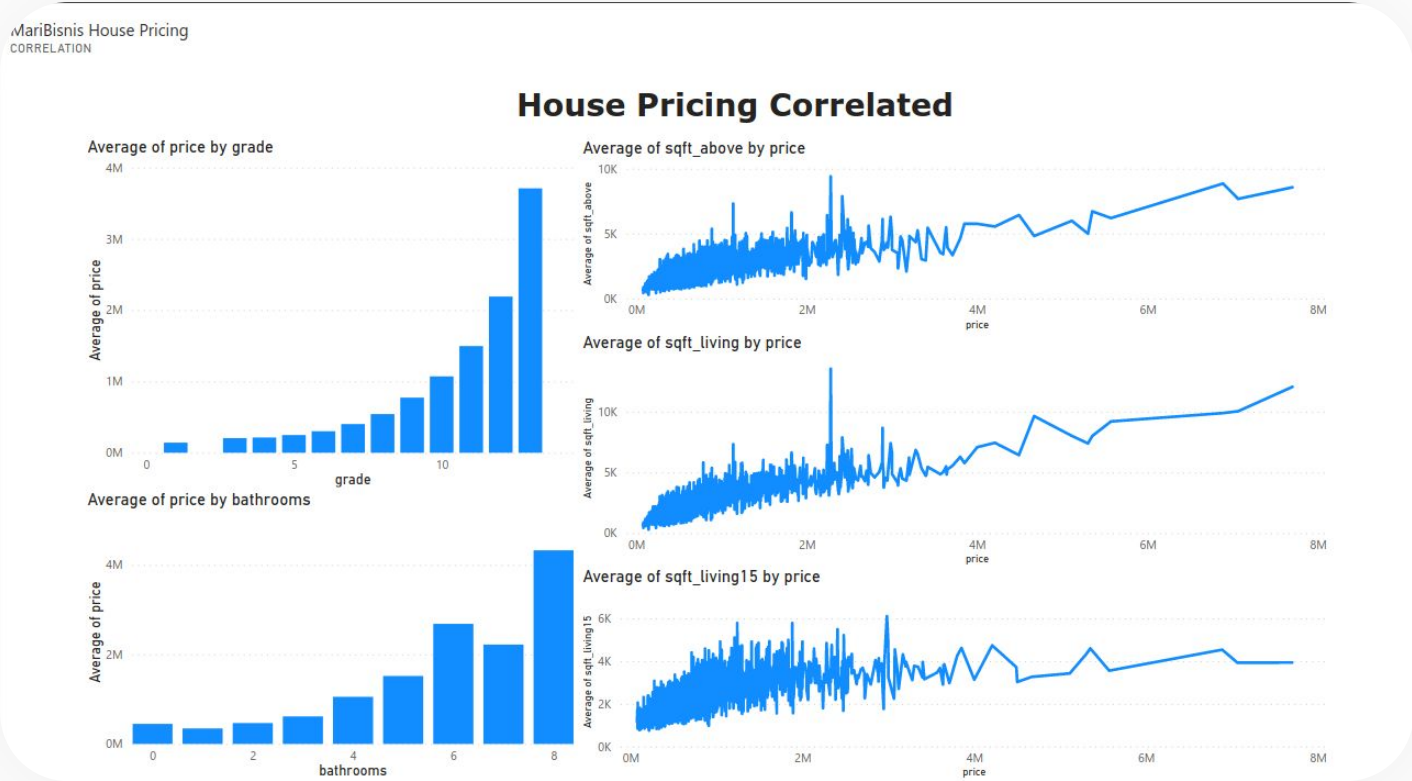
House Pricing Correlated Visualization



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Thank you!

Authoring

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Capstone Repository:
github.com/irasalsabila/microsoft-capstone-maribisnis