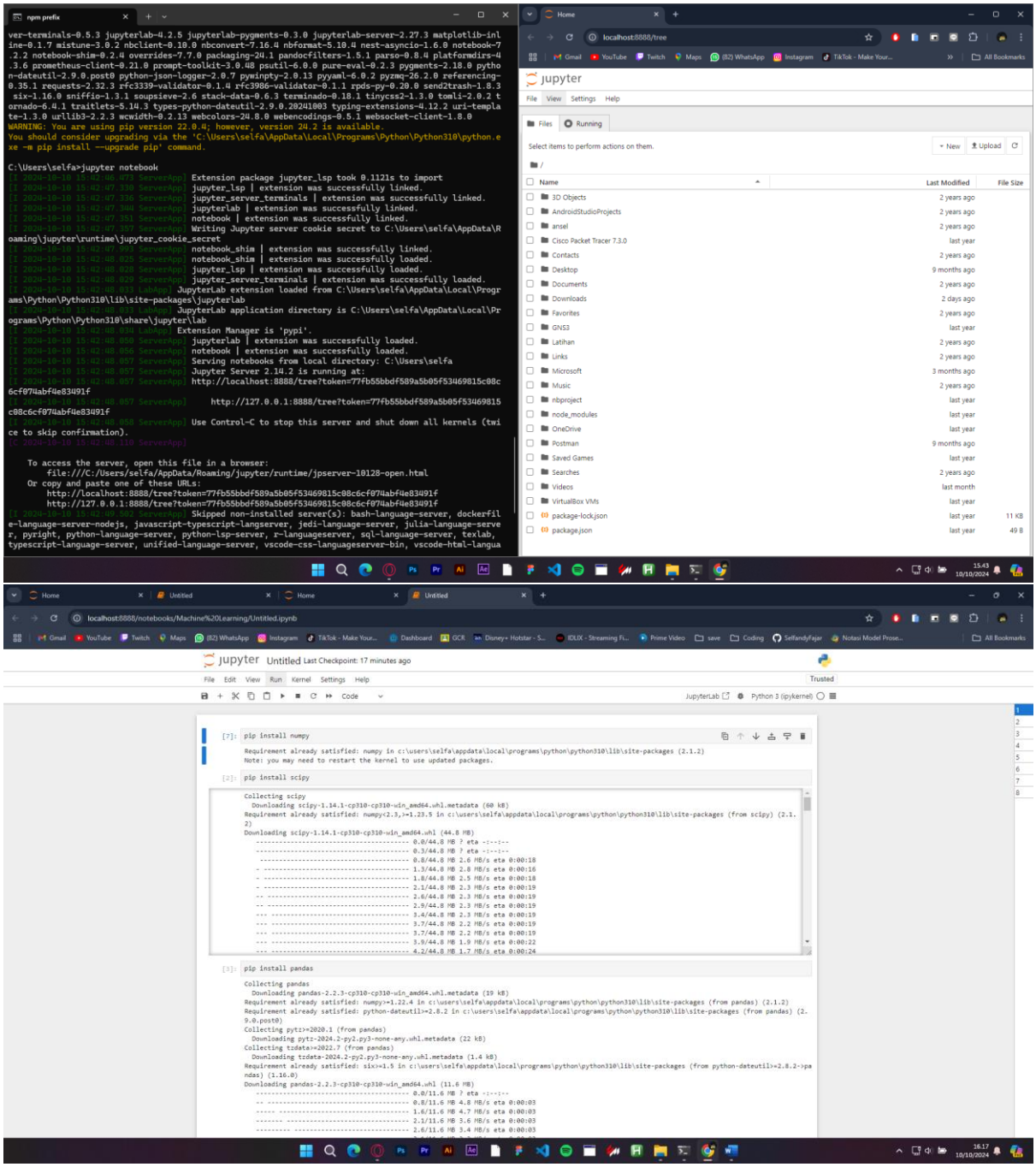
Nama : Selfandy Fajar Kautsara Rahutama

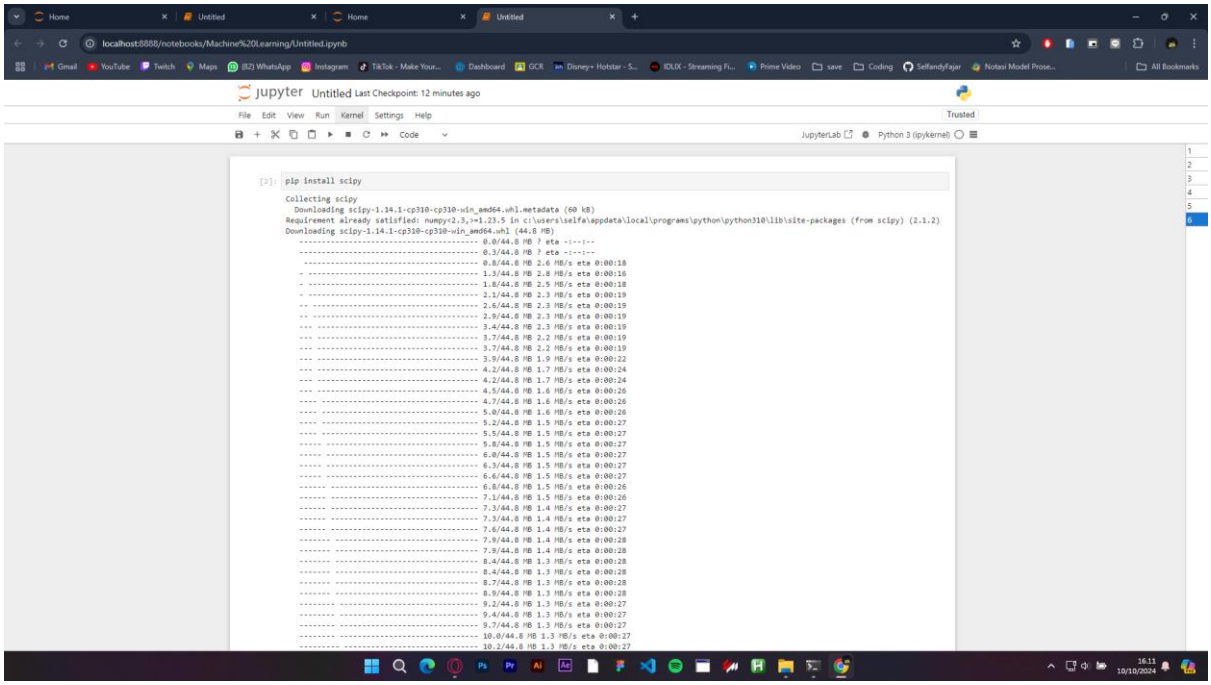
NPM : 41155050210032

Kelas : A2

Matakuliah : Machine Learning

Soal 1

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localhost:8888/notebooks/Machine%20Learning/Untitled.ipynb
jupyter Untitled Last Checkpoint: 12 minutes ago
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Code
JupyterLab
Python 3 (ipykernel)
[2]: pip install scipy
Collecting scipy
Downloading scipy-1.14.1-cp310-cp310-win_amd64.whl.metadata (60 kB)
Requirement already satisfied: numpy<2.3,>=1.23.5 in c:\users\selfa\appdata\local\programs\python\python310\lib\site-packages (from scipy) (2.1.2)
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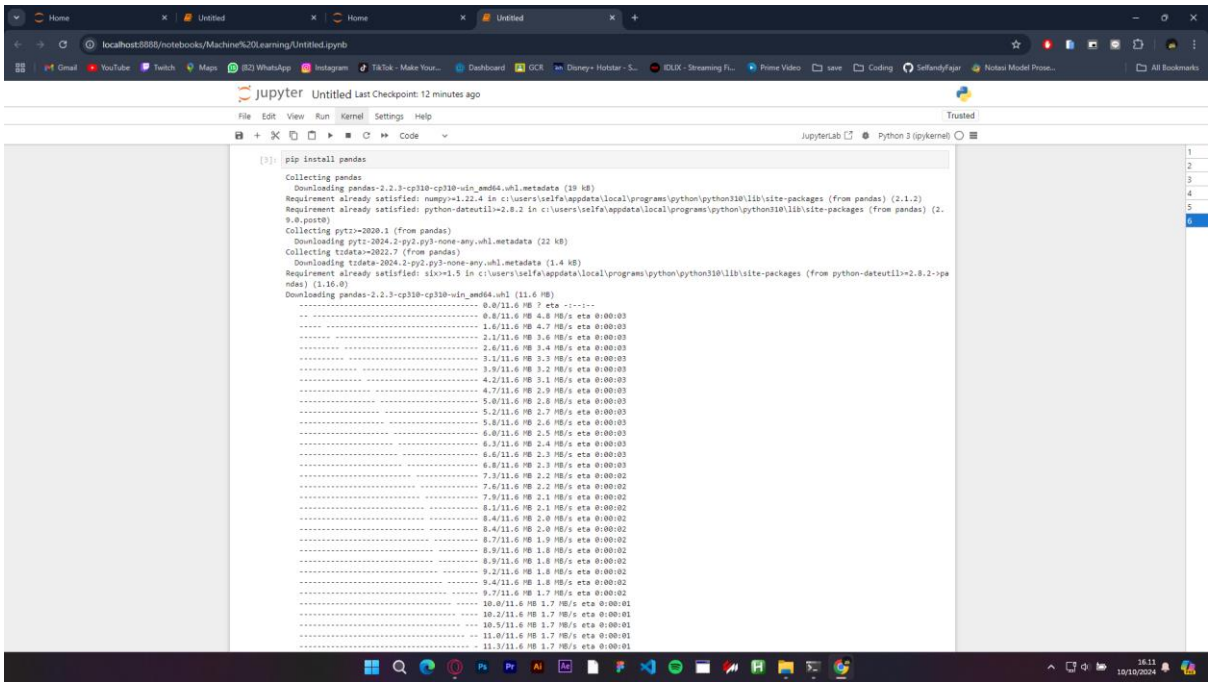
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Code
JupyterLab
Python 3 (ipykernel)
[3]: pip install pandas
Collecting pandas
Downloading pandas-2.2.3-cp310-cp310-win_amd64.whl.metadata (19 kB)
Requirement already satisfied: numpy>=1.22.4 in c:\users\selfa\appdata\local\programs\python\python310\lib\site-packages (from pandas) (2.1.2)
Requirement already satisfied: python-dateutil>=2.8.2 in c:\users\selfa\appdata\local\programs\python\python310\lib\site-packages (from pandas) (2.9.0.post0)
Collecting pytz>=2020.1 (from pandas)
Downloading pytz-2024.2-py2.py3-none-any.whl.metadata (22 kB)
Collecting tzdata>=2022.7 (from pandas)
Downloading tzdata-2024.2-py2.py3-none-any.whl.metadata (1.4 kB)
Requirement already satisfied: six>=1.5 in c:\users\selfa\appdata\local\programs\python\python310\lib\site-packages (from python-dateutil>=2.8.2->pandas) (1.16.0)
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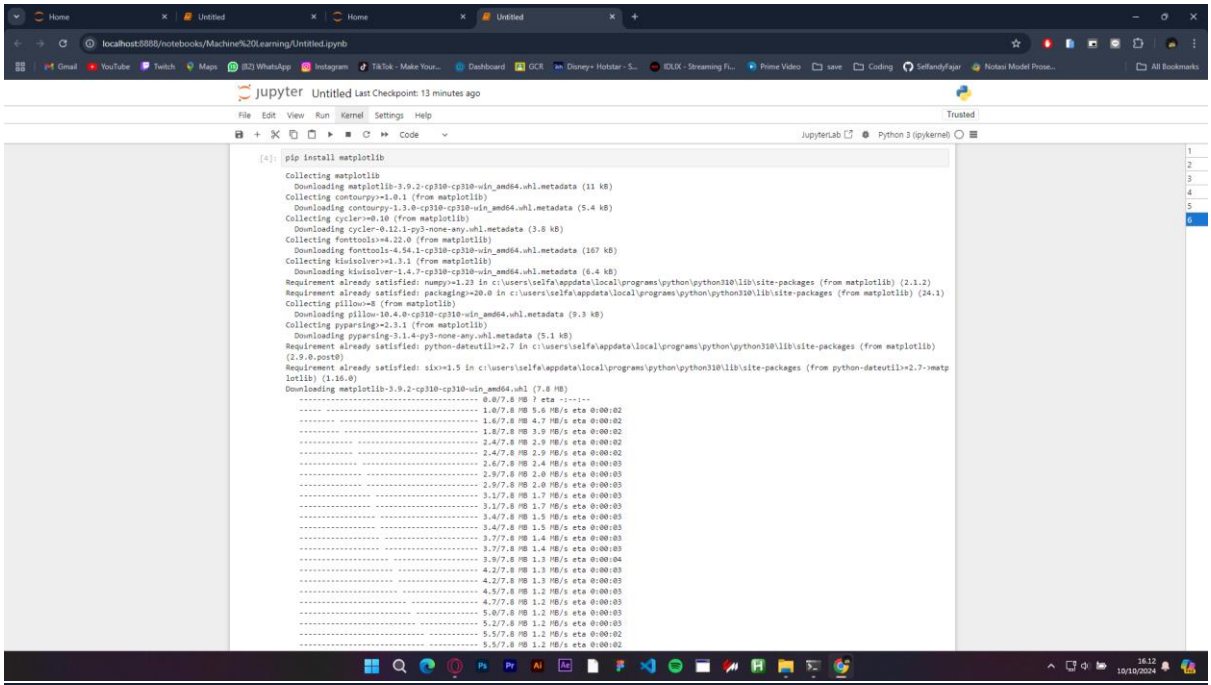
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jupyter Untitled Last Checkpoint: 13 minutes ago
File Edit View Run Kernel Settings Help
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Code
JupyterLab
Python 3 (ipykernel)
[4]: pip install matplotlib
Collecting matplotlib
Downloading matplotlib-3.9.2-cp310-cp310-win_amd64.whl.metadata (11 kB)
Collecting contourpy>=1.0.1 (from matplotlib)
Downloading contourpy-1.3.0-cp310-cp310-win_amd64.whl.metadata (5.4 kB)
Collecting cycler>=0.10 (from matplotlib)
Downloading cycler-0.12.1-py3-none-any.whl.metadata (3.8 kB)
Collecting fonttools>=4.22.0 (from matplotlib)
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Collecting kiwisolver>=1.3.1 (from matplotlib)
Downloading kiwisolver-1.4.7-cp310-cp310-win_amd64.whl.metadata (6.4 kB)
Requirement already satisfied: numpy>=1.23 in c:\users\selfa\appdata\local\programs\python\python310\lib\site-packages (from matplotlib) (2.1.2)
Requirement already satisfied: packaging>=20.0 in c:\users\selfa\appdata\local\programs\python\python310\lib\site-packages (from matplotlib) (24.1)
Collecting pillow>=8 (from matplotlib)
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Collecting pyparsing>=2.3.1 (from matplotlib)
Downloading pyparsing-3.1.4-py3-none-any.whl.metadata (5.1 kB)
Requirement already satisfied: python-dateutil>=2.7 in c:\users\selfa\appdata\local\programs\python\python310\lib\site-packages (from matplotlib)
(2.9.0.post0)
Requirement already satisfied: six>=1.5 in c:\users\selfa\appdata\local\programs\python\python310\lib\site-packages (from python-dateutil>=2.7->matp
lotlib) (1.16.0)
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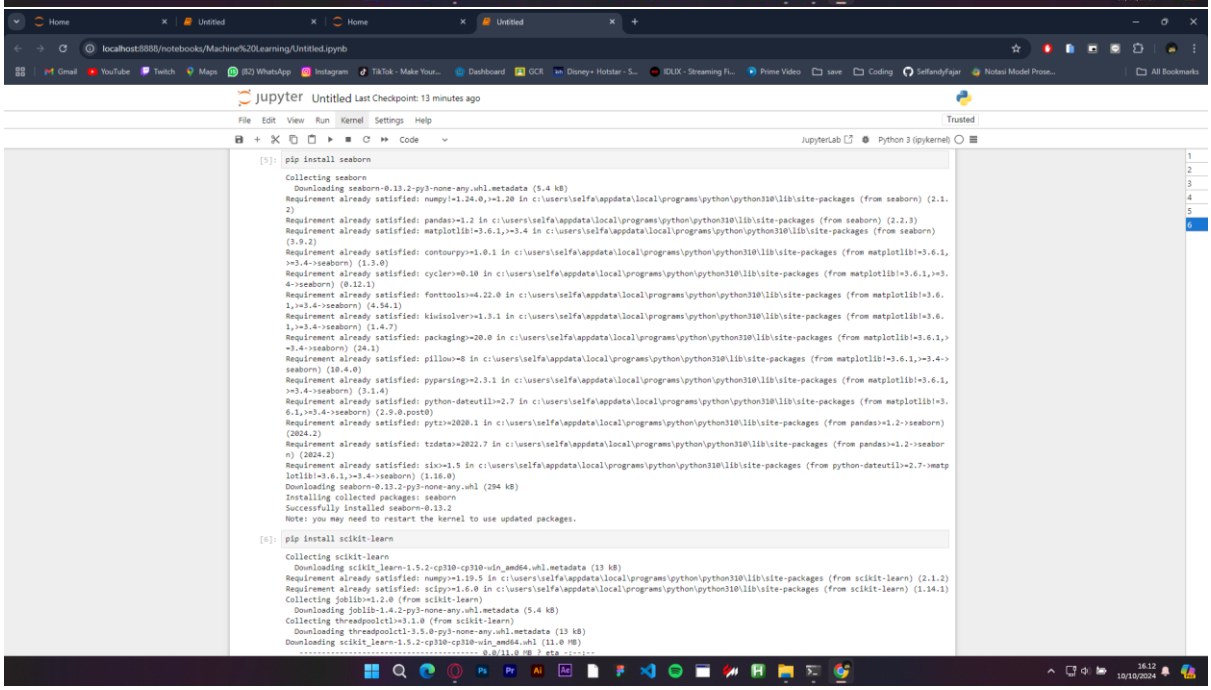
10/10/2024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localhost:8888/notebooks/Machine%20Learning/Untitled.ipynb
jupyter Untitled Last Checkpoint: 13 minutes ago
File Edit View Run Kernel Settings Help
Trusted
Code
JupyterLab
Python 3 (ipykernel)
[5]: pip install seaborn
Collecting seaborn
Downloading seaborn-0.13.2-py3-none-any.whl.metadata (5.4 kB)
Requirement already satisfied: numpy!=1.24.0,>=1.20 in c:\users\selfa\appdata\local\programs\python\python310\lib\site-packages (from seaborn) (2.1.
2)
Requirement already satisfied: pandas>=1.2 in c:\users\selfa\appdata\local\programs\python\python310\lib\site-packages (from seaborn) (2.2.3)
Requirement already satisfied: matplotlib!=3.6.1,>=3.4 in c:\users\selfa\appdata\local\programs\python\python310\lib\site-packages (from seaborn)
(3.9.2)
Requirement already satisfied: contourpy>=1.0.1 in c:\users\selfa\appdata\local\programs\python\python310\lib\site-packages (from matplotlib!=3.6.1,
>=3.4->seaborn) (1.3.0)
Requirement already satisfied: cycler>=0.10 in c:\users\selfa\appdata\local\programs\python\python310\lib\site-packages (from matplotlib!=3.6.1,>=3.
4->seaborn) (0.12.1)
Requirement already satisfied: fonttools>=4.22.0 in c:\users\selfa\appdata\local\programs\python\python310\lib\site-packages (from matplotlib!=3.6.
1,>=3.4->seaborn) (4.54.1)
Requirement already satisfied: kiwisolver>=1.3.1 in c:\users\selfa\appdata\local\programs\python\python310\lib\site-packages (from matplotlib!=3.6.
1,>=3.4->seaborn) (1.4.7)
Requirement already satisfied: packaging>=20.0 in c:\users\selfa\appdata\local\programs\python\python310\lib\site-packages (from matplotlib!=3.6.1,>
=3.4->seaborn) (24.1)
Requirement already satisfied: pillow>=8 in c:\users\selfa\appdata\local\programs\python\python310\lib\site-packages (from matplotlib!=3.6.1,>=3.4->
seaborn) (10.4.0)
Requirement already satisfied: pyparsing>=2.3.1 in c:\users\selfa\appdata\local\programs\python\python310\lib\site-packages (from matplotlib!=3.6.1,
>=3.4->seaborn) (3.1.4)
Requirement already satisfied: python-dateutil>=2.7 in c:\users\selfa\appdata\local\programs\python\python310\lib\site-packages (from matplotlib!=3.
6.1,>=3.4->seaborn) (2.9.0.post0)
Requirement already satisfied: pytz>=2020.1 in c:\users\selfa\appdata\local\programs\python\python310\lib\site-packages (from pandas>=1.2->seaborn)
(2024.2)
Requirement already satisfied: tzdata>=2022.7 in c:\users\selfa\appdata\local\programs\python\python310\lib\site-packages (from pandas>=1.2->seabor
n) (2024.2)
Requirement already satisfied: six>=1.5 in c:\users\selfa\appdata\local\programs\python\python310\lib\site-packages (from python-dateutil>=2.7->matp
lotlib!=3.6.1,>=3.4->seaborn) (1.16.0)
Downloading seaborn-0.13.2-py3-none-any.whl (294 kB)
Installing collected packages: seaborn
Successfully installed seaborn-0.13.2
Note: you may need to restart the kernel to use updated packages.
[6]: pip install scikit-learn
Collecting scikit-learn
Downloading scikit_learn-1.5.2-cp310-cp310-win_amd64.whl.metadata (13 kB)
Requirement already satisfied: numpy>=1.19.5 in c:\users\selfa\appdata\local\programs\python\python310\lib\site-packages (from scikit-learn) (2.1.2)
Requirement already satisfied: scipy>=1.6.0 in c:\users\selfa\appdata\local\programs\python\python310\lib\site-packages (from scikit-learn) (1.14.1)
Collecting joblib>=1.2.0 (from scikit-learn)
Downloading joblib-1.4.2-py3-none-any.whl.metadata (5.4 kB)
Collecting threadpoolctl>=3.1.0 (from scikit-learn)
Downloading threadpoolctl-3.5.0-py3-none-any.whl.metadata (13 kB)
Downloading scikit_learn-1.5.2-cp310-cp310-win_amd64.whl (11.0 MB)
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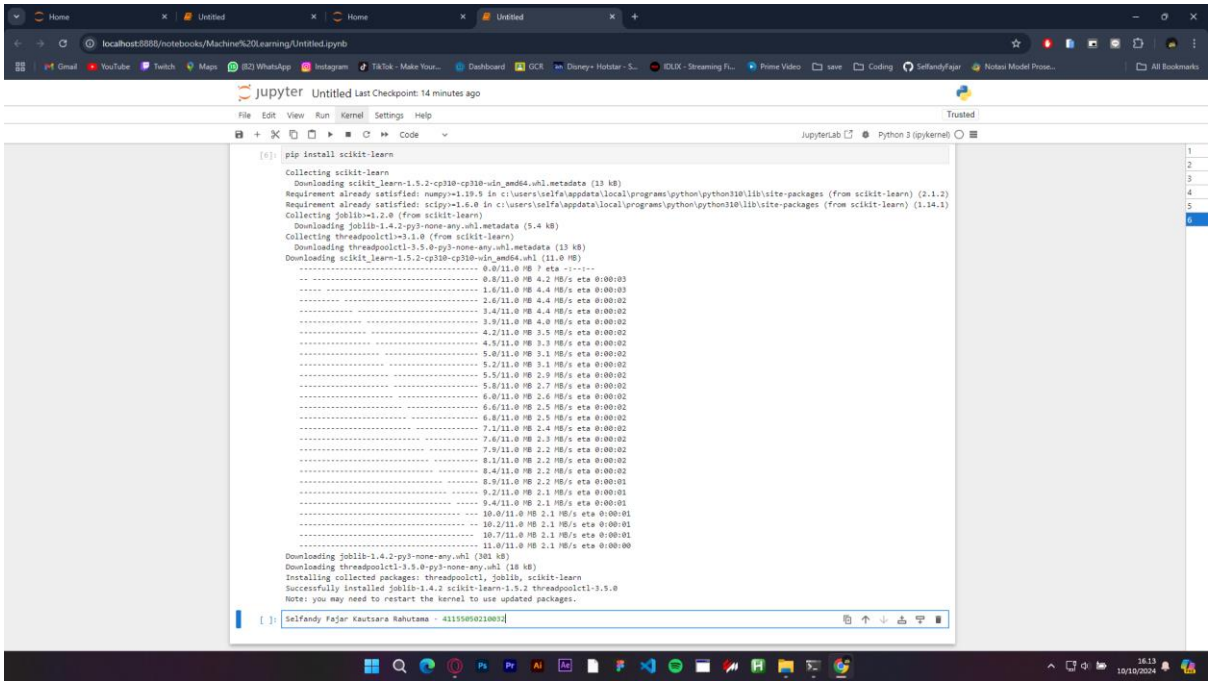
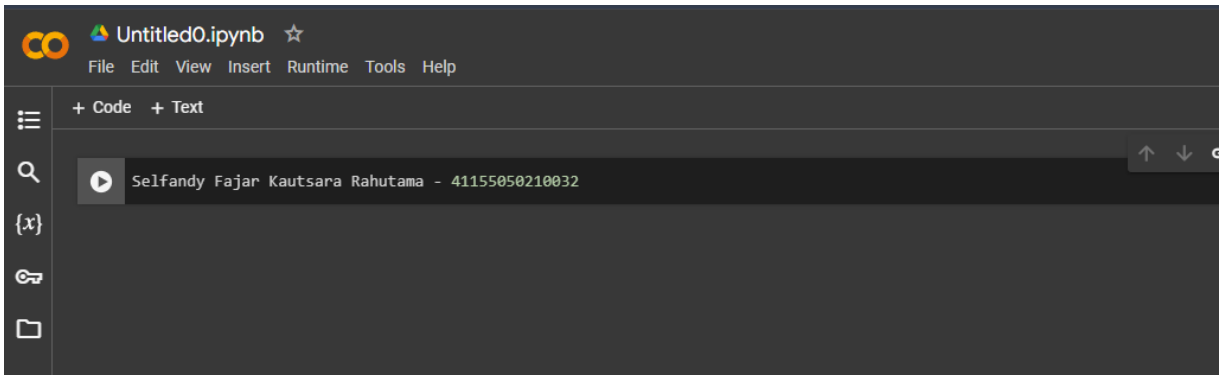

Jupyter Untitled Last Checkpoint: 14 minutes ago
pip install scikit-learn
Selfandy Fajar Kautsara Rahutama - 41155050210032

Soal 2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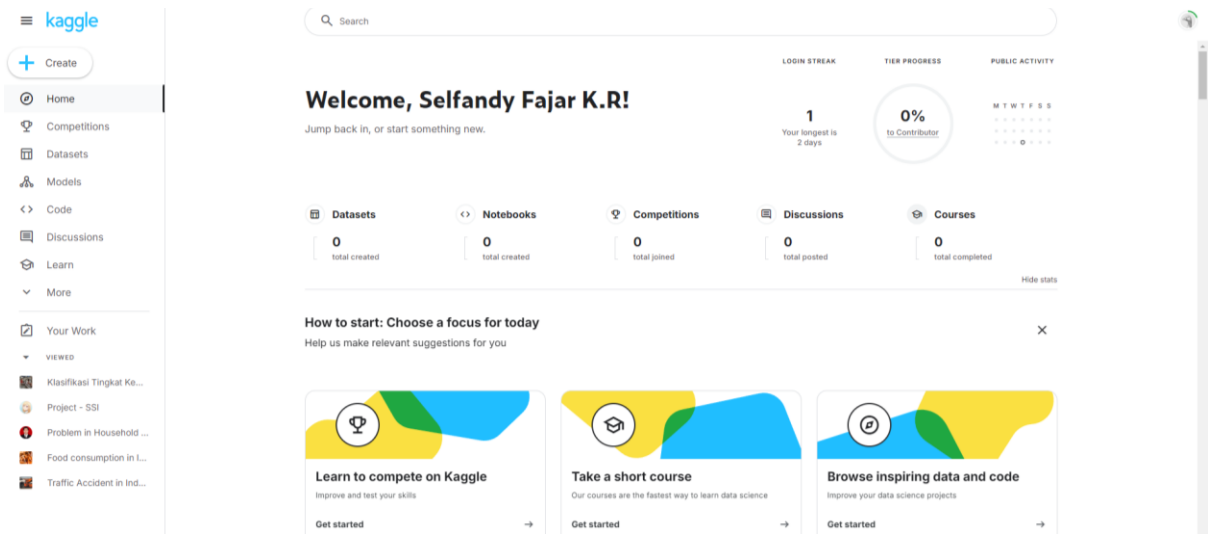
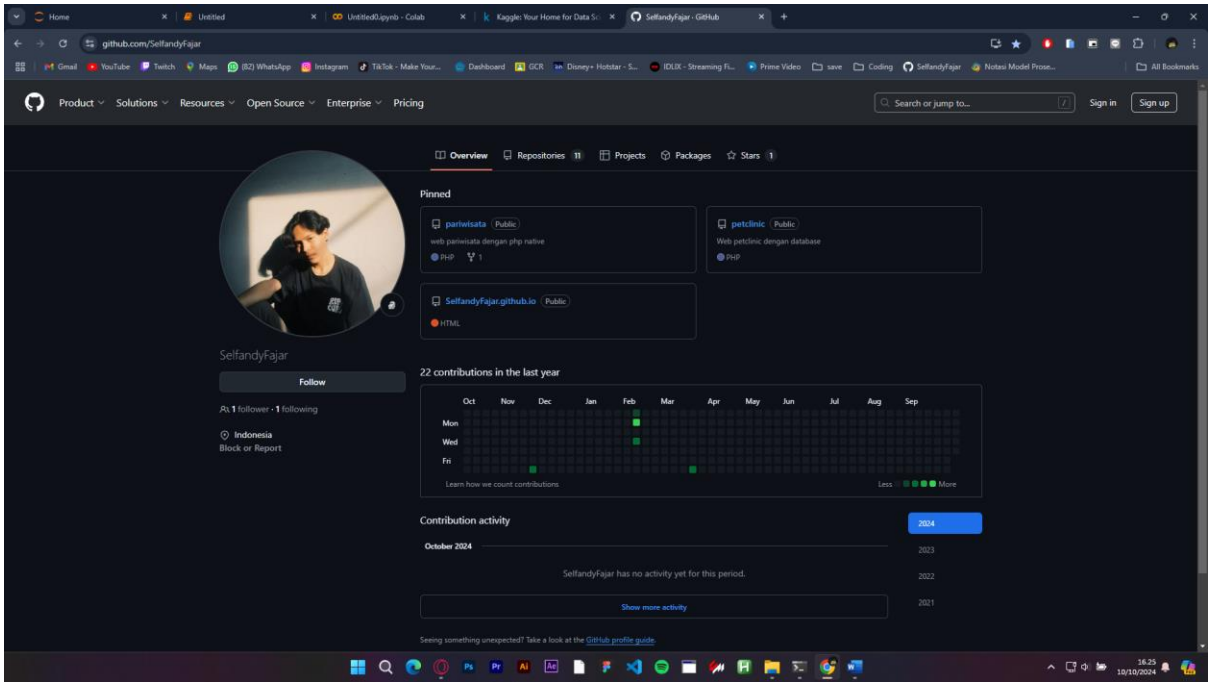
Selfandy Fajar Kautsara Rahutama - 41155050210032

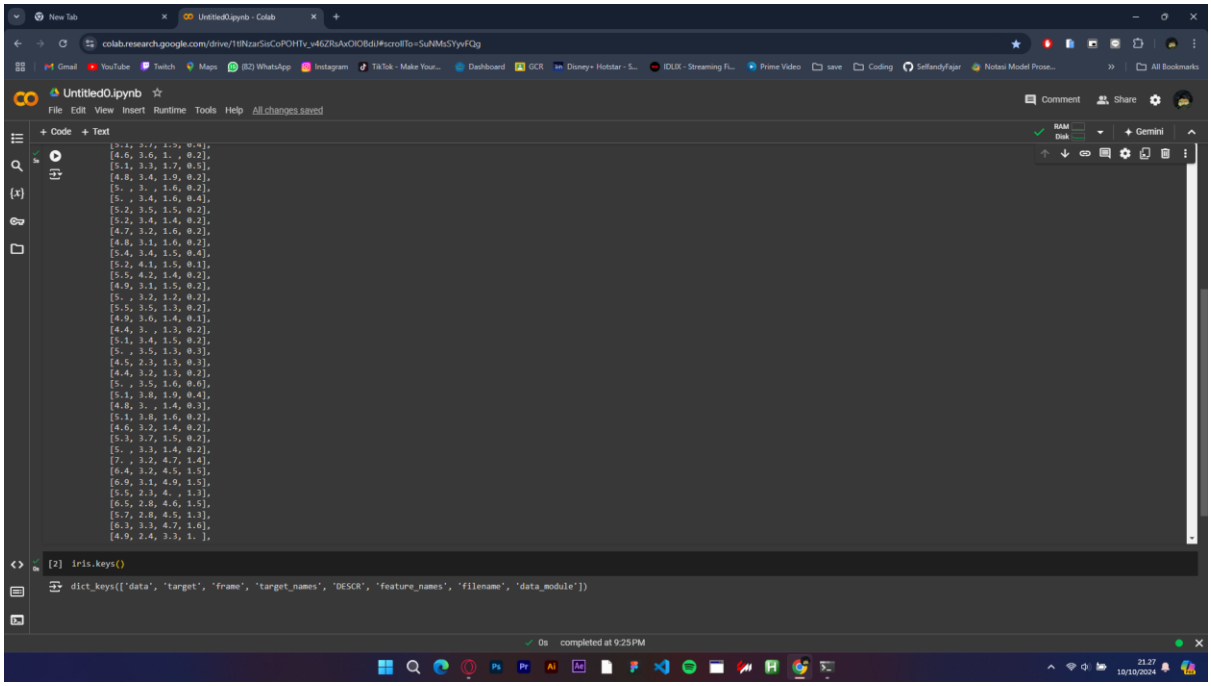
Soal 3


kaggle
Create
Home
Competitions
Datasets
Models
Code
Discussions
Learn
More
Your Work
Welcome, Selfandy Fajar K.R!
Jump back in, or start something new.
Datasets
Notebooks
Competitions
Discussions
Courses
How to start: Choose a focus for today
Learn to compete on Kaggle
Take a short course
Browse inspiring data and code

Soal 4


Product
Solutions
Resources
Open Source
Enterprise
Pricing
Search or jump to...
Sign in
Sign up
Overview
Repositories 11
Projects
Packages
Stars 1
Pinned
pariwisata Public
web pariwisata dengan php native
PHP 1
petclinic Public
Web petclinic dengan database
PHP
SelfandyFajar.github.io Public
HTML
SelfandyFajar
Follow
1 follower · 1 following
Indonesia
Block or Report
22 contributions in the last year
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Mon
Wed
Fri
Learn how we count contributions
Less More
Contribution activity
October 2024
SelfandyFajar has no activity yet for this period.
Show more activity
2024
2023
2022
2021
Seeing something unexpected? Take a look at the GitHub profile guide.

Soal 5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File Edit View Insert Runtime Tools Help All changes saved
Comment
Share
+ Code + Text
+ Gemini
[2] iris.keys()
dict_keys(['data', 'target', 'frame', 'target_names', 'DESCR', 'feature_names', 'filename', 'data_module'])
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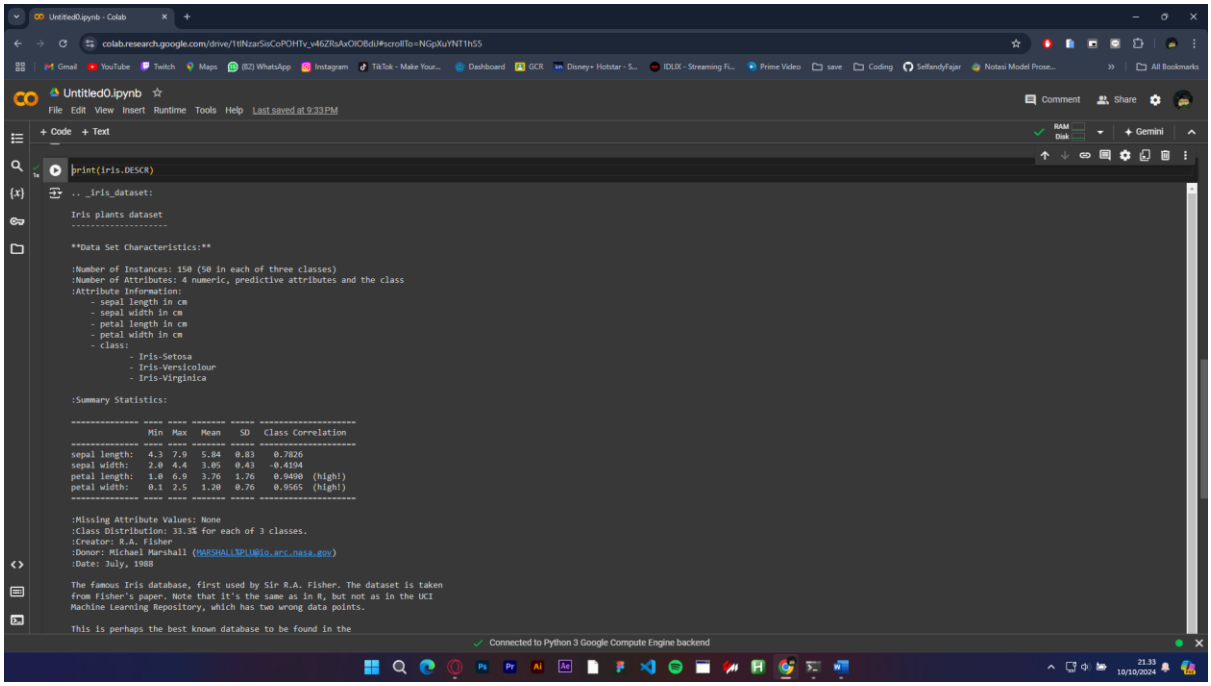
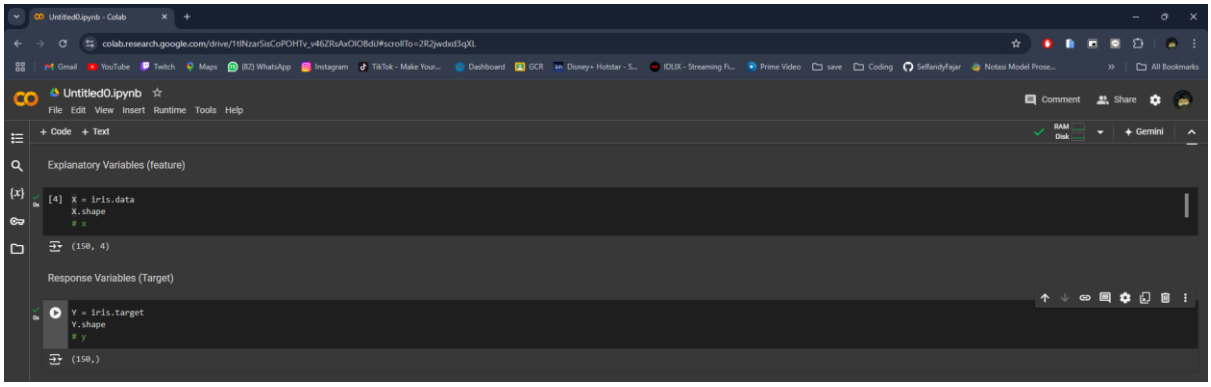
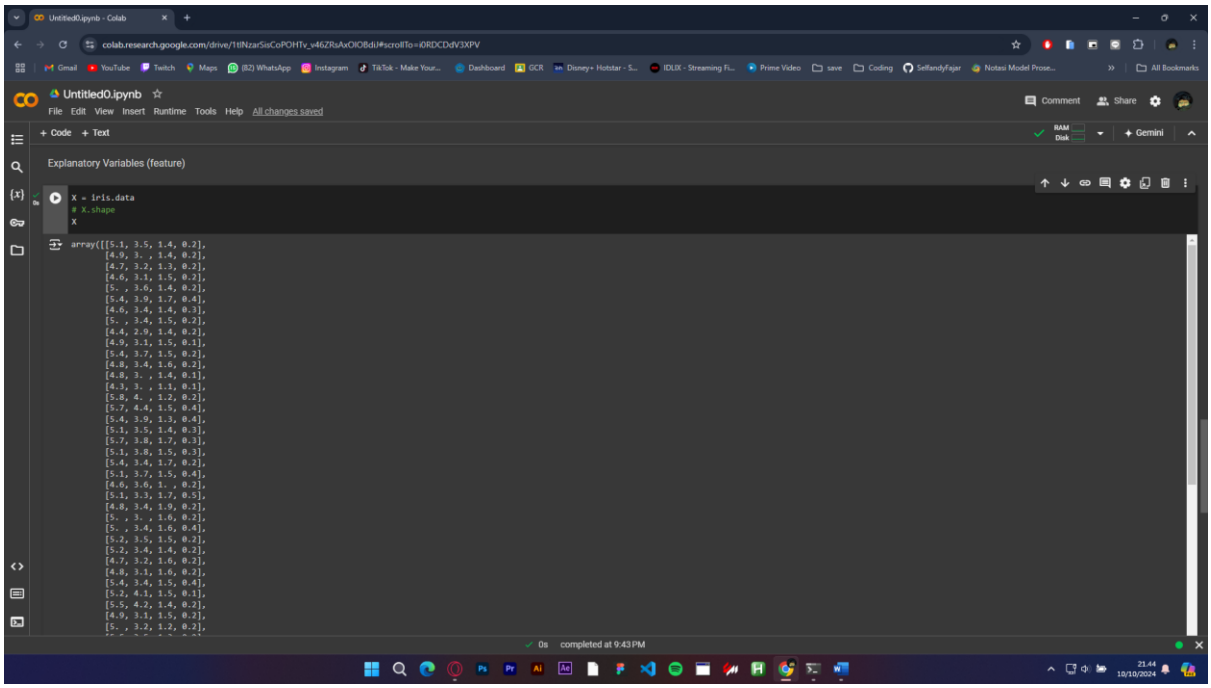

Untitled0.ipynb - Colab
colab.research.google.com/drive/1tlNzarSisCoPOHTv_v46ZRsAxOlOBdJi#scrollTo=NGpXuYNT1hS5
Untitled0.ipynb
File Edit View Insert Runtime Tools Help Last saved at 9:33 PM
Comment
Share
+ Code + Text
Gemini
print(iris.DESCR)
.. _iris_dataset:
Iris plants dataset
Data Set Characteristics:
:Number of Instances: 150 (50 in each of three classes)
:Number of Attributes: 4 numeric, predictive attributes and the class
:Attribute Information:
- sepal length in cm
- sepal width in cm
- petal length in cm
- petal width in cm
- class:
- Iris-Setosa
- Iris-Versicolour
- Iris-Virginica
:Summary Statistics:
Min Max Mean SD Class Correlation
sepal length: 4.3 7.9 5.84 0.83 0.7826
sepal width: 2.0 4.4 3.05 0.43 -0.4194
petal length: 1.0 6.9 3.76 1.76 0.9490 (high!)
petal width: 0.1 2.5 1.20 0.76 0.9565 (high!)
:Missing Attribute Values: None
:Class Distribution: 33.3% for each of 3 classes.
:Creator: R.A. Fisher
:Donor: Michael Marshall (MARSHALL%PLU@io.arc.nasa.gov)
:Date: July, 1988
The famous Iris database, first used by Sir R.A. Fisher. The dataset is taken
from Fisher's paper. Note that it's the same as in R, but not as in the UCI
Machine Learning Repository, which has two wrong data points.
This is perhaps the best known database to be found in the
Connected to Python 3 Google Compute Engine backend


Untitled0.ipynb - Colab
colab.research.google.com/drive/1tlNzarSisCoPOHTv_v46ZRsAxOlOBdJi#scrollTo=2R2jwdxd3qXL
Untitled0.ipynb
File Edit View Insert Runtime Tools Help
Comment
Share
+ Code + Text
Gemini
Explanatory Variables (feature)
[4] X = iris.data
X.shape
x
(150, 4)
Response Variables (Target)
Y = iris.target
Y.shape
y
(150,)


Untitled0.ipynb - Colab
colab.research.google.com/drive/1tlNzarSisCoPOHTv_v46ZRsAxOlOBdJi#scrollTo=0RDCDdV3XPV
Untitled0.ipynb
File Edit View Insert Runtime Tools Help All changes saved
Comment
Share
+ Code + Text
Gemini
Explanatory Variables (feature)
X = iris.data
# X.shape
X
array([[5.1, 3.5, 1.4, 0.2],
[4.9, 3. , 1.4, 0.2],
[4.7, 3.2, 1.3, 0.2],
[4.6, 3.1, 1.5, 0.2],
[5. , 3.6, 1.4, 0.2],
[5.4, 3.9, 1.7, 0.4],
[4.6, 3.4, 1.4, 0.3],
[5. , 3.4, 1.5, 0.2],
[4.4, 2.9, 1.4, 0.2],
[4.9, 3.1, 1.5, 0.1],
[5.4, 3.7, 1.5, 0.2],
[4.8, 3.4, 1.6, 0.2],
[4.8, 3. , 1.4, 0.1],
[4.3, 3. , 1.1, 0.1],
[5.8, 4. , 1.2, 0.2],
[5.7, 4.4, 1.5, 0.4],
[5.4, 3.9, 1.3, 0.4],
[5.1, 3.5, 1.4, 0.3],
[5.7, 3.8, 1.7, 0.3],
[5.1, 3.8, 1.5, 0.3],
[5.4, 3.4, 1.7, 0.2],
[5.1, 3.7, 1.5, 0.4],
[4.6, 3.6, 1. , 0.2],
[5.1, 3.3, 1.7, 0.5],
[4.8, 3.4, 1.9, 0.2],
[5. , 3. , 1.6, 0.2],
[5. , 3.4, 1.6, 0.4],
[5.2, 3.5, 1.5, 0.2],
[5.2, 3.4, 1.4, 0.2],
[4.7, 3.2, 1.6, 0.2],
[4.8, 3.1, 1.6, 0.2],
[5.4, 3.4, 1.5, 0.4],
[5.2, 4.1, 1.5, 0.1],
[5.5, 4.2, 1.4, 0.2],
[4.9, 3.1, 1.5, 0.2],
[5. , 3.2, 1.2, 0.2],
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Explanatory Variables (feature)

```
X = iris.data
# X.shape
X
```

Show hidden output

Response Variables (Target)

```
[7] Y = iris.target
    # Y.shape
    Y
```

```
array([0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
       0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
       0, 0, 0, 0, 0, 0, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,
       1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,
       1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2,
       2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2,
       2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2])
```

Feature & Target Names

```
[8] feature_name = iris.feature_names
    feature_name
```

```
['sepal length (cm)',
 'sepal width (cm)',
 'petal length (cm)',
 'petal width (cm)']
```

```
[9] target_name = iris.target_names
    target_name
```

```
array(['setosa', 'versicolor', 'virginica'], dtype='<U10')
```

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Visualisasi Sepal Lenght & Width

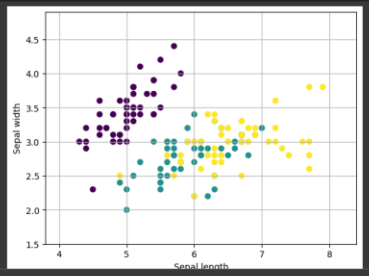
```
import matplotlib.pyplot as plt

X = X[:, :2]

x_min, x_max = X[:, 0].min() - 0.5, X[:, 0].max() + 0.5
y_min, y_max = X[:, 1].min() - 0.5, X[:, 1].max() + 0.5

plt.scatter(X[:, 0], X[:, 1], c=Y)
plt.xlabel('Sepal length')
plt.ylabel('Sepal width')

plt.xlim(x_min, x_max)
plt.ylim(y_min, y_max)
plt.grid(True)
plt.show()
```



0s completed at 10:14PM

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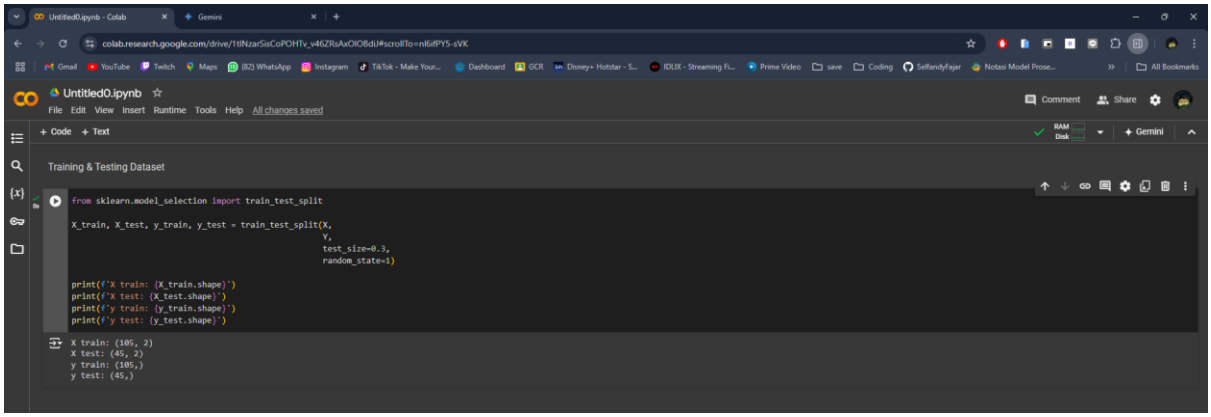
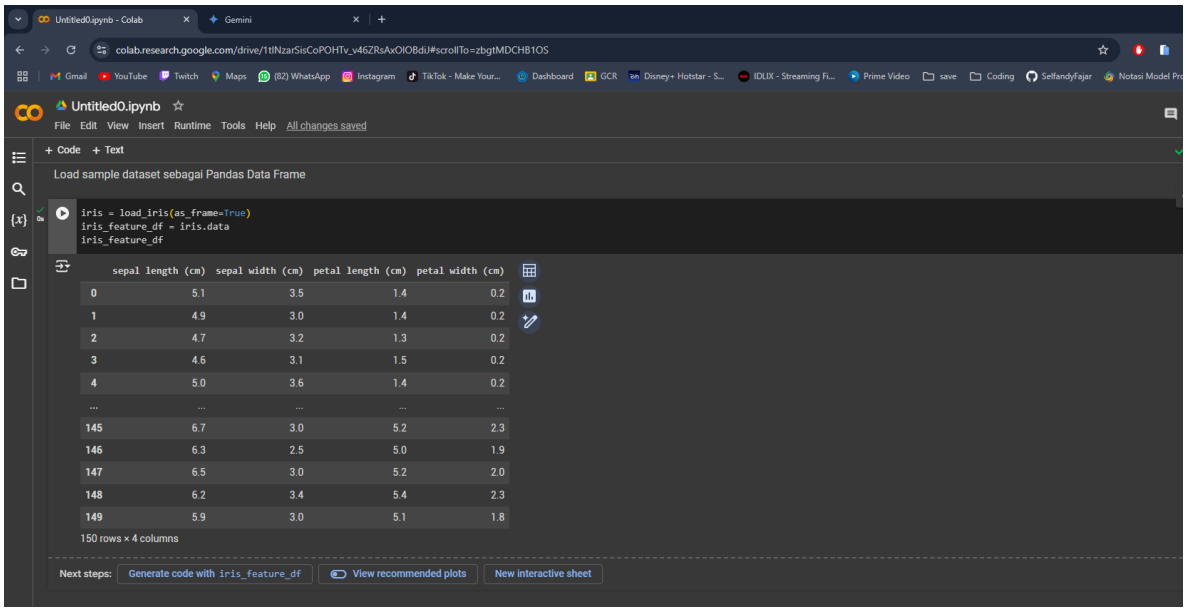
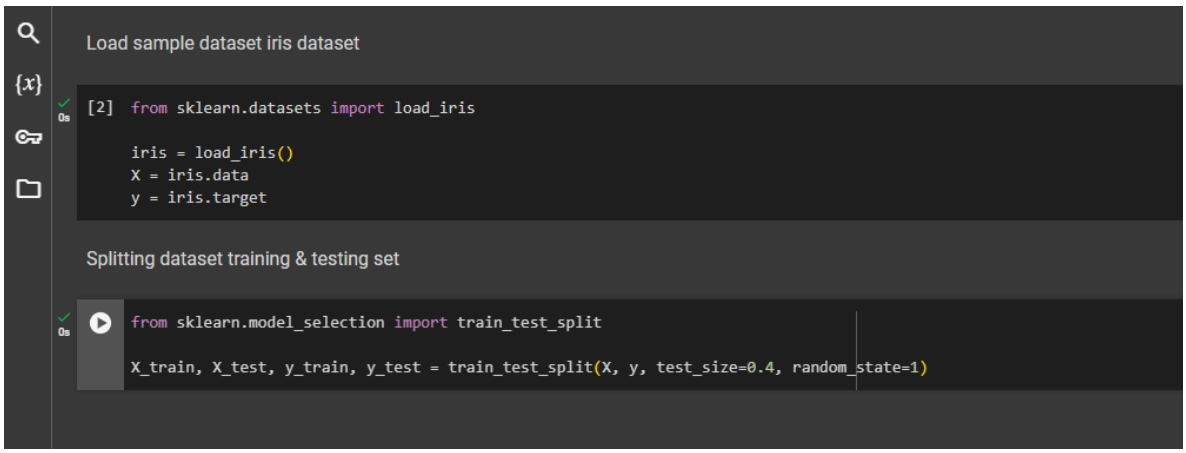

Untitled0.ipynb
Training & Testing Dataset
from sklearn.model_selection import train_test_split
X_train, X_test, y_train, y_test = train_test_split(X,
Y,
test_size=0.3,
random_state=1)
print(f'X train: {X_train.shape}')
print(f'X test: {X_test.shape}')
print(f'y train: {y_train.shape}')
print(f'y test: {y_test.shape}')
X train: (105, 2)
X test: (45, 2)
y train: (105,)
y test: (45,)


Untitled0.ipynb
Load sample dataset sebagai Pandas Data Frame
iris = load_iris(as_frame=True)
iris_feature_df = iris.data
iris_feature_df
sepal length (cm) sepal width (cm) petal length (cm) petal width (cm)
0 5.1 3.5 1.4 0.2
1 4.9 3.0 1.4 0.2
2 4.7 3.2 1.3 0.2
3 4.6 3.1 1.5 0.2
4 5.0 3.6 1.4 0.2
145 6.7 3.0 5.2 2.3
146 6.3 2.5 5.0 1.9
147 6.5 3.0 5.2 2.0
148 6.2 3.4 5.4 2.3
149 5.9 3.0 5.1 1.8
150 rows × 4 columns
Next steps:
Generate code with iris_feature_df
View recommended plots
New interactive sheet

Soal 6


Load sample dataset iris dataset
[2] from sklearn.datasets import load_iris
iris = load_iris()
X = iris.data
y = iris.target
Splitting dataset training & testing set
from sklearn.model_selection import train_test_split
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.4, random_state=1)

Training model Machine Learning

```
from sklearn.neighbors import KNeighborsClassifier

model = KNeighborsClassifier(n_neighbors=3)
model.fit(X_train, y_train)
```

```
KNeighborsClassifier(n_neighbors=3)
```

Evaluasi model Machine Learning

```
from sklearn.metrics import accuracy_score

y_pred = model.predict(X_test)
acc = accuracy_score(y_test, y_pred)
print(f'Accuracy: {acc}')
```

```
Accuracy: 0.9833333333333333
```

Pemanfaatan trained model machine learning

```
data_baru = [[5, 5, 3, 2],
             [2, 4, 3, 5]]

preds = model.predict(data_baru)
preds
```

```
array([1, 2])
```

```
pred_species = [iris.target_names[p] for p in preds]
print(f'Hasil Prediksi: {pred_species}')
```

```
Hasil Prediksi: ['versicolor', 'virginica']
```

Deploy model Machine Learning | Dumping dan Loading model Machine Learning

```
import joblib

joblib.dump(model, 'iris_classifier_knn.joblib')
```

```
['iris_classifier_knn.joblib']
```

```
production_model = joblib.load('iris_classifier_knn.joblib')
```

Soal 7

Sample data

```
import numpy as np
from sklearn import preprocessing

sample_data = np.array([[2.1, -1.9, 5.5],
                        [-1.5, 2.4, 3.5],
                        [0.5, -7.9, 5.6],
                        [5.9, 2.3, -5.8]])

sample_data
```

```
array([[ 2.1, -1.9,  5.5],
       [-1.5,  2.4,  3.5],
       [ 0.5, -7.9,  5.6],
       [ 5.9,  2.3, -5.8]])
```

Suggested code may be subject to a license |

```
sample_data.shape
```

```
(4, 3)
```

Binaritation

```
[12] sample_data
```

```
array([[ 2.1, -1.9,  5.5],
       [-1.5,  2.4,  3.5],
       [ 0.5, -7.9,  5.6],
       [ 5.9,  2.3, -5.8]])
```

```
preprocessor = preprocessing.Binarizer(threshold=0.5)
binarized_data = preprocessor.transform(sample_data)
binarized_data
```

```
array([[1., 0., 1.],
       [0., 1., 1.],
       [0., 0., 1.],
       [1., 1., 0.]])
```

Scalling

```
[14] sample_data
```

```
array([[ 2.1, -1.9,  5.5],
       [-1.5,  2.4,  3.5],
       [ 0.5, -7.9,  5.6],
       [ 5.9,  2.3, -5.8]])
```

```
[15] preprocessor = preprocessing.MinMaxScaler(feature_range=(0, 1))
preprocessor.fit(sample_data)
scaled_data = preprocessor.transform(sample_data)
scaled_data
```

```
array([[0.48648649, 0.58252427, 0.99122807],
       [0.        , 1.        , 0.81578947],
       [0.27027027, 0.        , 1.        ],
       [1.        , 0.99029126, 0.        ]])
```

```
scaled_data = preprocessor.fit_transform(sample_data)
scaled_data
```

```
array([[0.48648649, 0.58252427, 0.99122807],
       [0.        , 1.        , 0.81578947],
       [0.27027027, 0.        , 1.        ],
       [1.        , 0.99029126, 0.        ]])
```

Normalisation L1

```
[17] sample_data
```

```
array([[ 2.1, -1.9,  5.5],
       [-1.5,  2.4,  3.5],
       [ 0.5, -7.9,  5.6],
       [ 5.9,  2.3, -5.8]])
```

```
l1_normalized_data = preprocessing.normalize(sample_data, norm='l1')
l1_normalized_data
```

```
array([[ 0.22105263, -0.2       ,  0.57894737],
       [-0.2027027 ,  0.32432432,  0.47297297],
       [ 0.03571429, -0.56428571,  0.4       ],
       [ 0.42142857,  0.16428571, -0.41428571]])
```

Normalisation L2

```
[19] sample_data
```

```
array([[ 2.1, -1.9,  5.5],
       [-1.5,  2.4,  3.5],
       [ 0.5, -7.9,  5.6],
       [ 5.9,  2.3, -5.8]])
```

```
[20] l2_normalized_data = preprocessing.normalize(sample_data, norm='l2')
     l2_normalized_data
```

```
array([[ 0.33946114, -0.30713151,  0.88906489],
       [-0.33325106,  0.53320169,  0.7775858 ],
       [ 0.05156558, -0.81473612,  0.57753446],
       [ 0.68706914,  0.26784051, -0.6754239 ]])
```