In [54]:
```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
```

In [55]:
```
data=pd.read_csv('Heart Disease data.csv')
```

In [56]:
```
# Check for missing values
missing_values = data.isnull().sum()
print(missing_values)
```

```
age         0
sex         0
cp          0
trestbps    0
chol        0
fbs         0
restecg     0
thalach     0
exang       0
oldpeak     0
slope       0
ca          0
thal        0
target      0
dtype: int64
```

In [57]:
```
# Fill missing values or drop rows/columns
data = data.dropna()
```

In [58]:
```
data.columns = data.columns.str.strip()
```

In [59]:
```
# Convert categorical variables to numerical if necessary
data['sex'] = data['sex'].map({1: 'male', 0: 'female'})
data['cp'] = data['cp'].map({0: 'typical angina', 1: 'atypical angina', 2: 'non-angina
data['fbs'] = data['fbs'].map({1: '> 120 mg/dl', 0: '<= 120 mg/dl'})
data['restecg'] = data['restecg'].map({0: 'normal', 1: 'ST-T wave abnormality', 2: 'le
data['exang'] = data['exang'].map({1: 'yes', 0: 'no'})
data['thal'] = data['thal'].map({0: 'normal', 1: 'fixed defect', 2: 'reversable defect

# Any other transformations
# For example, if 'age' needs to be categorized
data['age_group'] = pd.cut(data['age'], bins=[0, 30, 45, 60, 100], labels=['0-30', '31
```

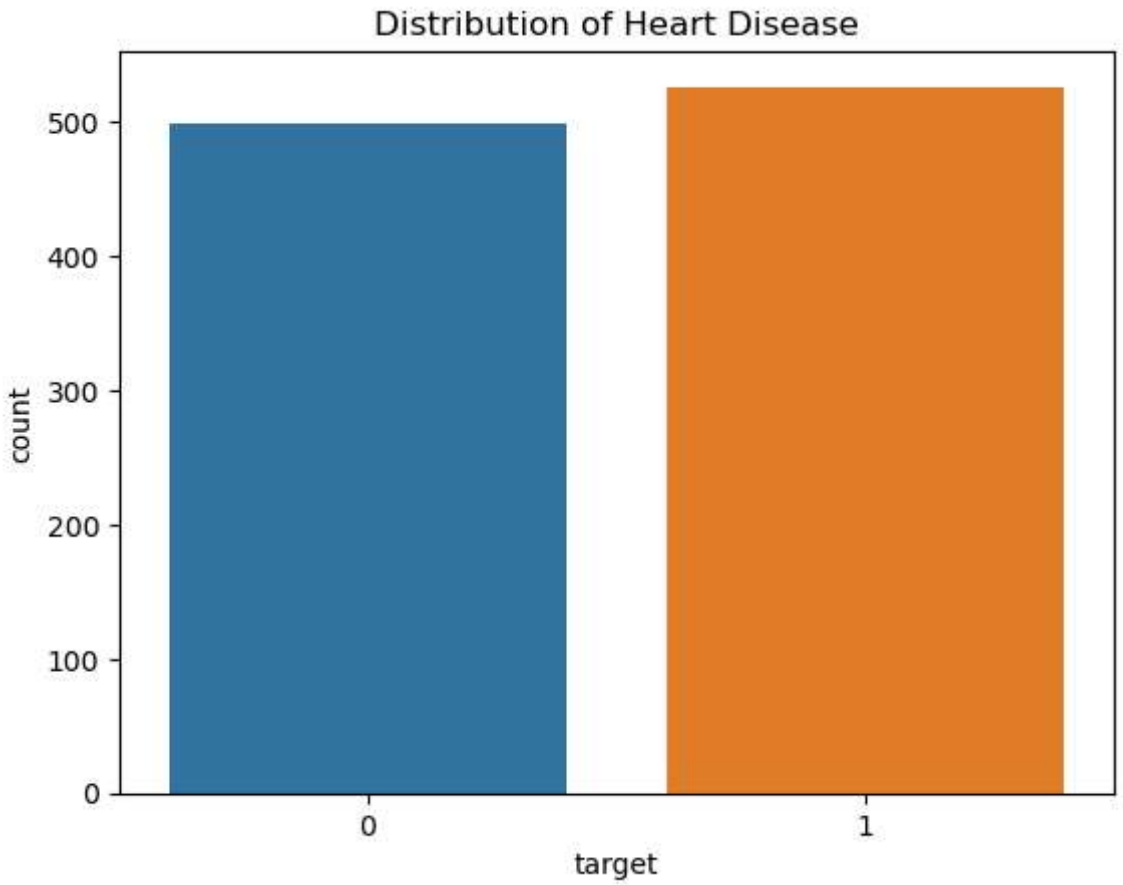
In [60]:
```
# Save the cleaned and transformed data to a new CSV file
data.to_csv('transformed_heart_disease_data.csv', index=False)
```

In [61]:
```
print(data.describe())
```

```
                age     trestbps        chol      thalach      oldpeak  \
count  1025.000000  1025.000000  1025.00000  1025.000000  1025.000000
mean     54.434146   131.611707   246.00000   149.114146     1.071512
std       9.072290    17.516718    51.59251    23.005724     1.175053
min      29.000000    94.000000   126.00000    71.000000     0.000000
25%      48.000000   120.000000   211.00000   132.000000     0.000000
50%      56.000000   130.000000   240.00000   152.000000     0.800000
75%      61.000000   140.000000   275.00000   166.000000     1.800000
max      77.000000   200.000000   564.00000   202.000000     6.200000

             slope           ca       target
count  1025.000000  1025.000000  1025.000000
mean      1.385366     0.754146     0.513171
std       0.617755     1.030798     0.500070
min       0.000000     0.000000     0.000000
25%       1.000000     0.000000     0.000000
50%       1.000000     0.000000     1.000000
75%       2.000000     1.000000     1.000000
max       2.000000     4.000000     1.000000
```

In [62]:
```
# Distribution of target variable
sns.countplot(x='target', data=data)
plt.title('Distribution of Heart Disease')
plt.show()
```



In [63]:
```
# Check the unique values and data types
print(data['sex'].unique())  # Ensure it's categorical or numerical
print(data['target'].unique())  # Ensure it's categorical or numerical
```

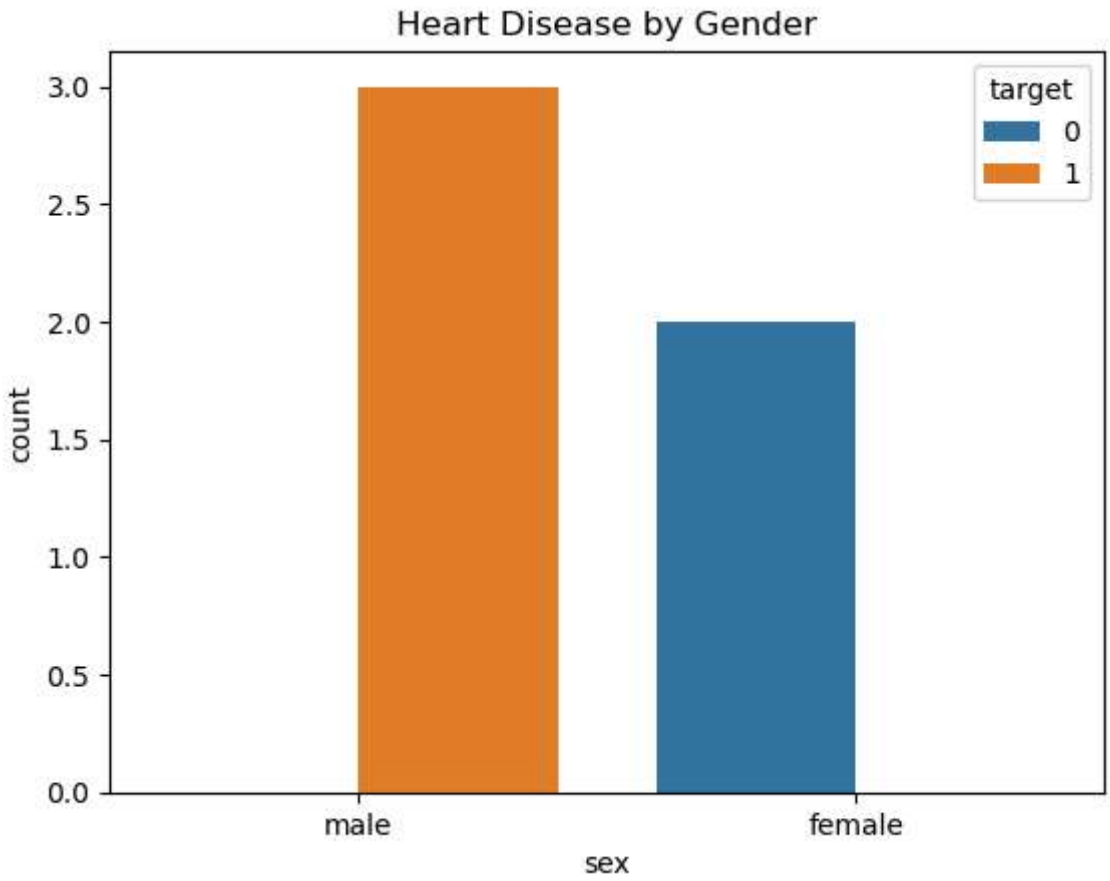
```
['male' 'female']
[0 1]
```

In [64]:
```
print(data.columns)
```

```
Index(['age', 'sex', 'cp', 'trestbps', 'chol', 'fbs', 'restecg', 'thalach',
       'exang', 'oldpeak', 'slope', 'ca', 'thal', 'target', 'age_group'],
      dtype='object')
```

In [65]:
```
data = pd.DataFrame({'sex':['male','female','male','female','male'],'target':[1,0,1,0,
```

In [66]:
```
# Plot heart disease rates by gender
sns.countplot(x='sex', hue='target', data=data)
plt.title('Heart Disease by Gender')
plt.show()
```



In [67]:
```
print(data.columns)
```

```
Index(['sex', 'target'], dtype='object')
```

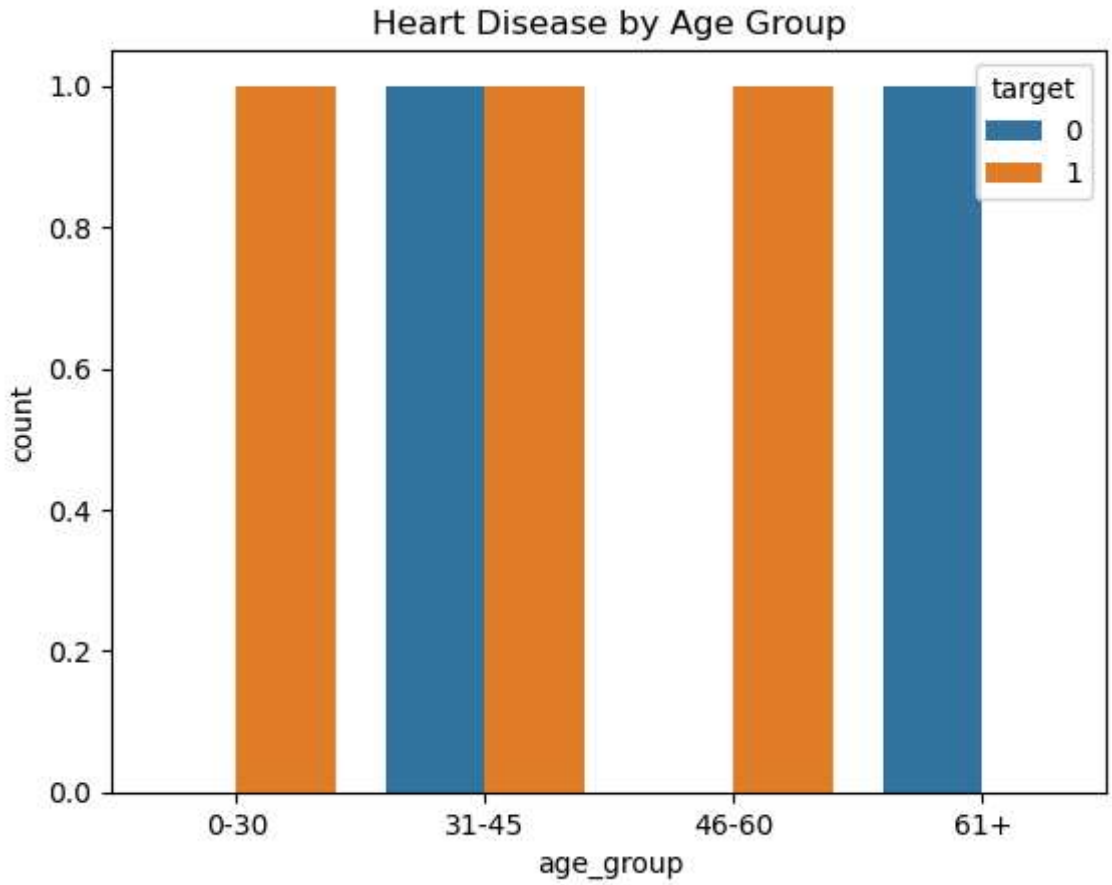
In [68]:
```
data = pd.DataFrame({
    'age': [25, 40, 55, 70, 35],
    'target': [1, 0, 1, 0, 1],
    'age_group': ['0-30', '31-45', '46-60', '61+', '31-45']  # Ensure all entries are
})
```

In [69]:
```
print(data.columns)
```

```
Index(['age', 'target', 'age_group'], dtype='object')
```

In [70]:
```
# Plot heart disease rates by age group
sns.countplot(x='age_group', hue='target', data=data)
```

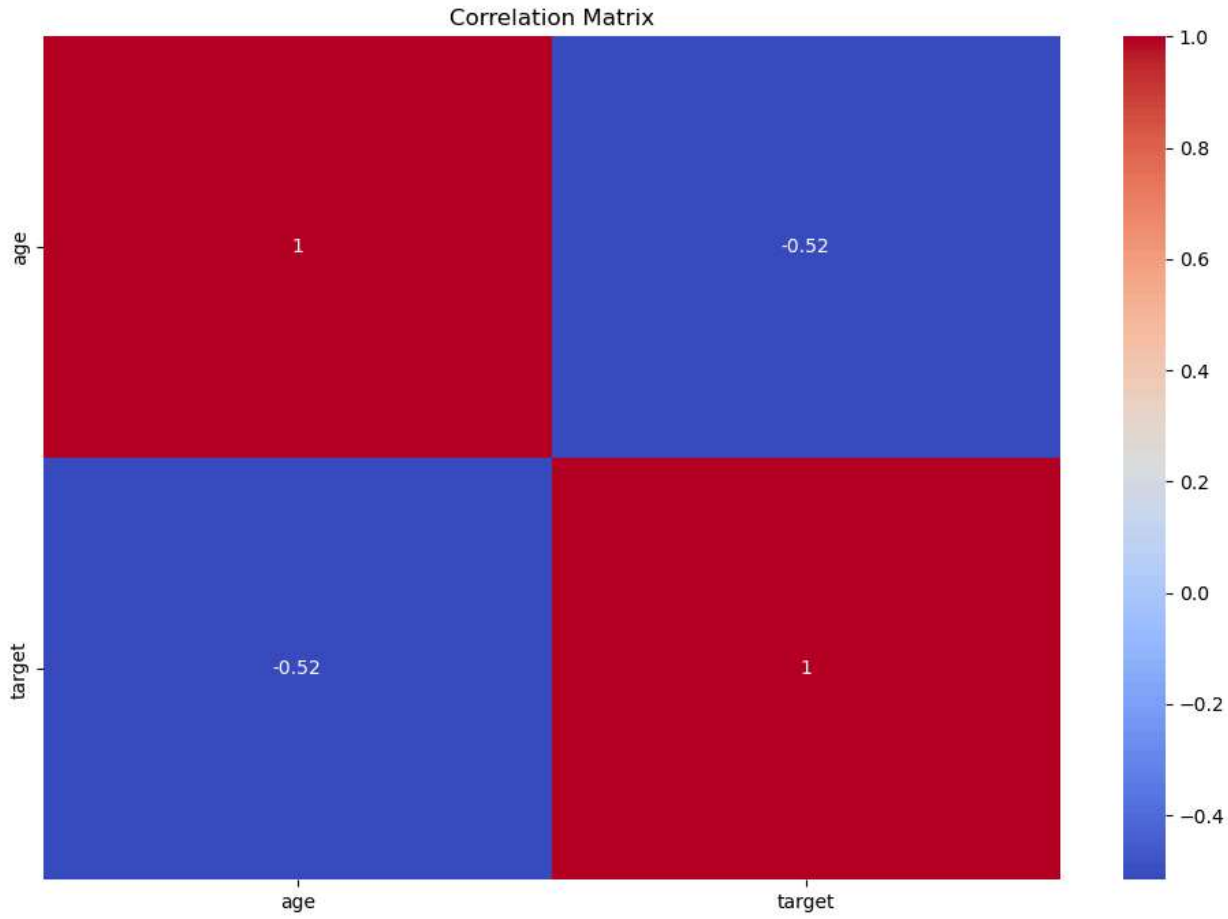
```
plt.title('Heart Disease by Age Group')
plt.show()
```



In [71]:
```
# Correlation heatmap
corr_matrix = data.corr()
plt.figure(figsize=(12, 8))
sns.heatmap(corr_matrix, annot=True, cmap='coolwarm')
plt.title('Correlation Matrix')
plt.show()
```

```
C:\Users\Vishal\AppData\Local\Temp\ipykernel_1076\953916749.py:2: FutureWarning:

The default value of numeric_only in DataFrame.corr is deprecated. In a future versio
n, it will default to False. Select only valid columns or specify the value of numeri
c_only to silence this warning.
```



Visualization and Dashboard

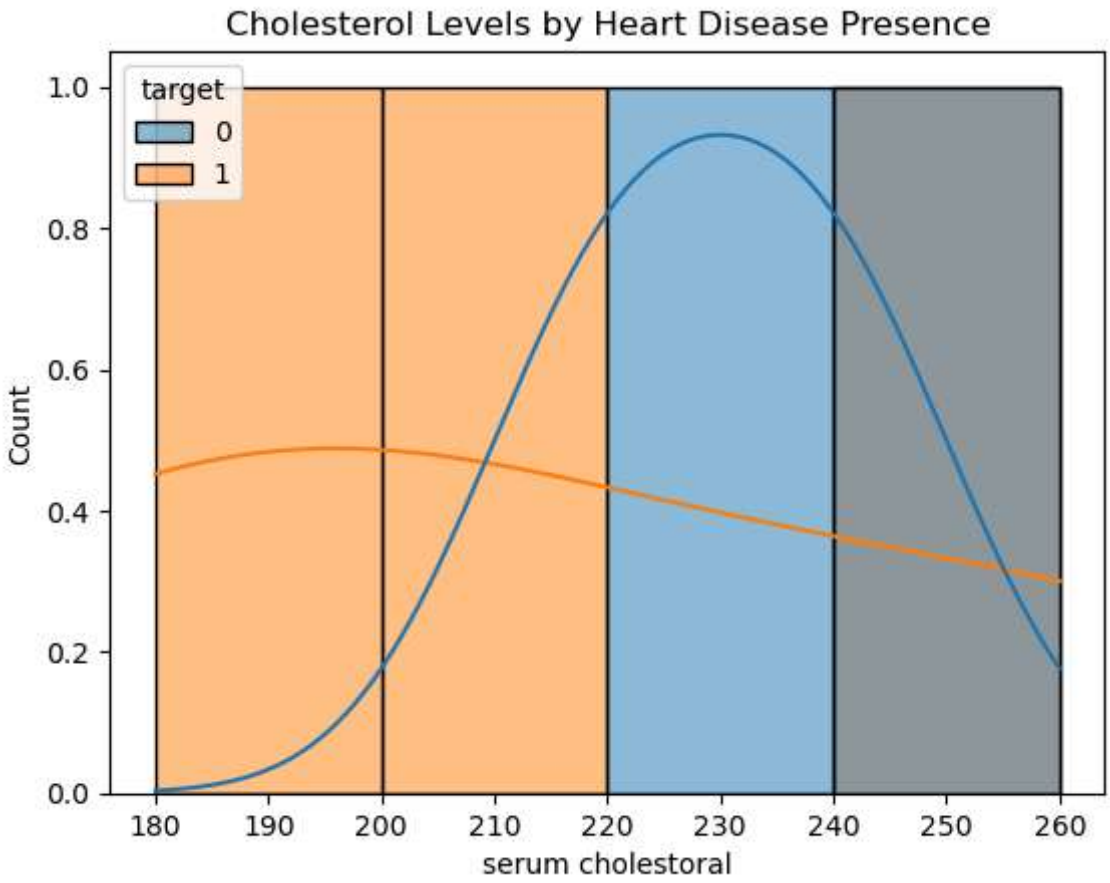
In [72]:
```
import plotly.express as px
```

In [73]:
```
# Define the DataFrame
data = pd.DataFrame({
    'age': [25, 40, 55, 70, 35],
    'target': [1, 0, 1, 0, 1],
    'serum cholestoral': [200, 240, 180, 220, 260]  # Sample cholesterol levels
})
```

In [74]:
```
print(data.columns)
```

```
Index(['age', 'target', 'serum cholestoral'], dtype='object')
```

In [75]:
```
sns.histplot(data=data, x='serum cholestoral', hue='target', kde=True)
plt.title('Cholesterol Levels by Heart Disease Presence')
plt.show()
```

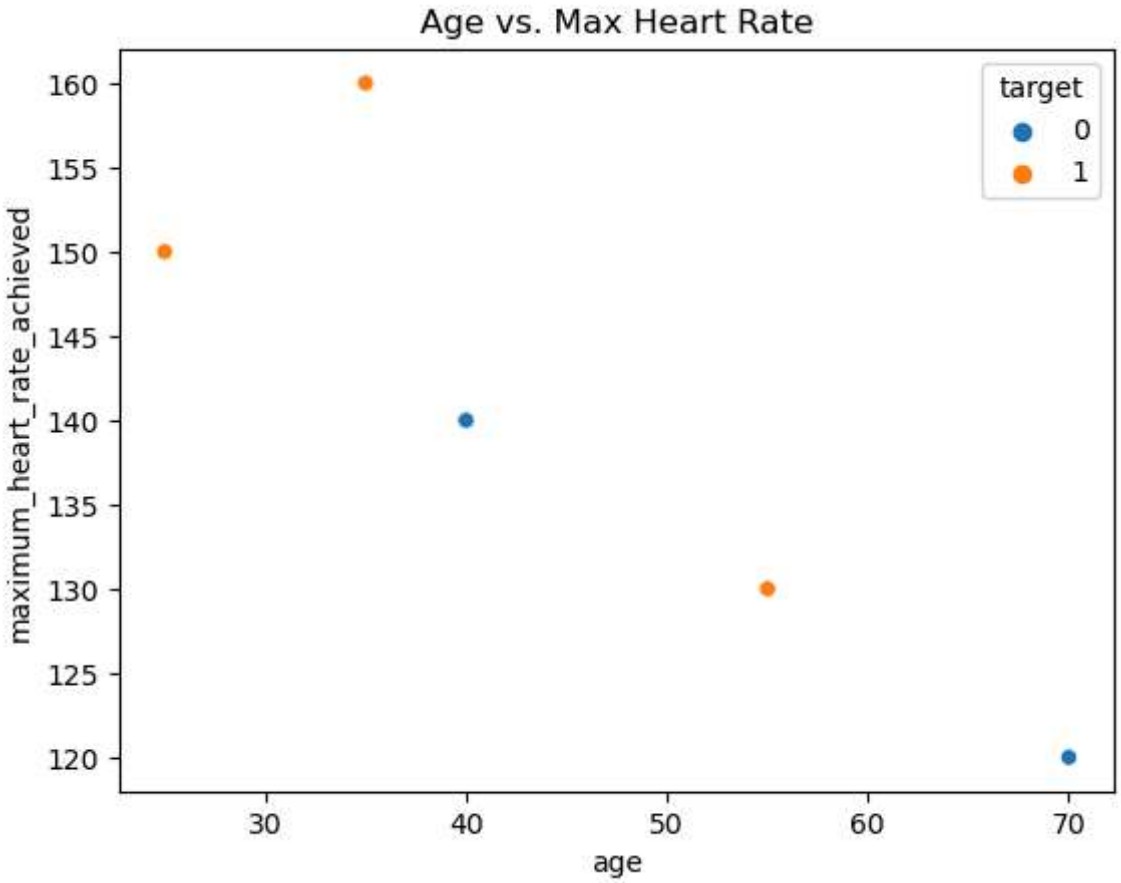


In [76]:
```
data = pd.DataFrame({
    'age': [25, 40, 55, 70, 35],
    'target': [1, 0, 1, 0, 1],
    'maximum_heart_rate_achieved': [150, 140, 130, 120, 160]  # Sample max heart rates
})
```

In [77]:
```
print(data.columns)
```

```
Index(['age', 'target', 'maximum_heart_rate_achieved'], dtype='object')
```

In [78]:
```
# Scatter plot of age vs. max heart rate
sns.scatterplot(data=data, x='age', y='maximum_heart_rate_achieved', hue='target')
plt.title('Age vs. Max Heart Rate')
plt.show()
```



In [79]:
```
# Interactive visualization with Plotly
fig = px.scatter(data, x='age', y='maximum_heart_rate_achieved', color='target', title
fig.show()
```

In [80]:
```
import sys
print(sys.executable)
```

```
C:\Users\Vishal\anaconda3\python.exe
```

In [81]:
```
!pip list
```

```
Package                       Version
----------------------------- ---------------
alabaster                     0.7.12
anaconda-client               1.11.2
anaconda-navigator            2.4.2
anaconda-project              0.11.1
anyio                         3.5.0
appdirs                       1.4.4
argon2-cffi                   21.3.0
argon2-cffi-bindings          21.2.0
arrow                         1.2.3
astroid                       2.14.2
astropy                       5.1
asttokens                     2.0.5
atomicwrites                  1.4.0
attrs                         22.1.0
Automat                       20.2.0
autopep8                      1.6.0
Babel                         2.11.0
backcall                      0.2.0
backports.functools-lru-cache 1.6.4
backports.tempfile            1.0
backports.weakref             1.0.post1
bcrypt                        3.2.0
beautifulsoup4                4.11.1
binaryornot                   0.4.4
black                         22.6.0
bleach                        4.1.0
bokeh                         2.4.3
boltons                       23.0.0
Bottleneck                    1.3.5
brotlipy                      0.7.0
certifi                       2024.2.2
cffi                          1.15.1
chardet                       4.0.0
charset-normalizer            2.0.4
click                         8.0.4
cloudpickle                   2.0.0
clyent                        1.2.2
colorama                      0.4.6
colorcet                      3.0.1
comm                          0.1.2
conda                         23.3.1
conda-build                   3.24.0
conda-content-trust           0.1.3
conda-pack                    0.6.0
conda-package-handling        2.0.2
conda_package_streaming       0.7.0
conda-repo-cli                1.0.41
conda-token                   0.4.0
conda-verify                  3.4.2
constantly                    15.1.0
contourpy                     1.0.5
cookiecutter                  1.7.3
cryptography                  39.0.1
cssselect                     1.1.0
cycler                        0.11.0
cytoolz                       0.12.0
daal4py                       2023.0.2
dash                          2.17.1
```

```
dash-core-components          2.0.0
dash-html-components          2.0.0
dash-table                    5.0.0
dask                          2022.7.0
datashader                    0.14.4
datashape                     0.5.4
debugpy                       1.5.1
decorator                     5.1.1
defusedxml                    0.7.1
diff-match-patch              20200713
dill                          0.3.6
distributed                   2022.7.0
docstring-to-markdown         0.11
docutils                      0.18.1
entrypoints                   0.4
et-xmlfile                    1.1.0
executing                     0.8.3
fastjsonschema                2.16.2
filelock                      3.9.0
flake8                        6.0.0
Flask                         2.2.2
flit_core                     3.6.0
fonttools                     4.25.0
fsspec                        2022.11.0
future                        0.18.3
gensim                        4.3.0
glob2                         0.7
greenlet                      2.0.1
h5py                          3.7.0
HeapDict                      1.0.1
holoviews                     1.15.4
huggingface-hub               0.10.1
hvplot                        0.8.2
hyperlink                     21.0.0
idna                          3.4
imagecodecs                   2021.8.26
imageio                       2.26.0
imagesize                     1.4.1
imbalanced-learn              0.10.1
importlib-metadata            4.11.3
incremental                   21.3.0
inflection                    0.5.1
iniconfig                     1.1.1
intake                        0.6.7
intervaltree                  3.1.0
ipykernel                     6.19.2
ipython                       8.10.0
ipython-genutils              0.2.0
ipywidgets                    7.6.5
isort                         5.9.3
itemadapter                   0.3.0
itemloaders                   1.0.4
itsdangerous                  2.0.1
jedi                          0.18.1
jellyfish                     0.9.0
Jinja2                        3.1.2
jinja2-time                   0.2.0
jmespath                      0.10.0
joblib                        1.1.1
json5                         0.9.6
```

jsonpatch	1.32
jsonpointer	2.1
jsonschema	4.17.3
jupyter	1.0.0
jupyter_client	7.3.4
jupyter-console	6.6.2
jupyter_core	5.2.0
jupyter-server	1.23.4
jupyterlab	3.5.3
jupyterlab-pygments	0.1.2
jupyterlab_server	2.19.0
jupyterlab-widgets	1.0.0
keyring	23.4.0
kiwisolver	1.4.4
lazy-object-proxy	1.6.0
libarchive-c	2.9
llvmlite	0.39.1
locket	1.0.0
lxml	4.9.1
lz4	3.1.3
Markdown	3.4.1
MarkupSafe	2.1.1
matplotlib	3.7.0
matplotlib-inline	0.1.6
mccabe	0.7.0
menuinst	1.4.19
mistune	0.8.4
mkl-fft	1.3.1
mkl-random	1.2.2
mkl-service	2.4.0
mock	4.0.3
mpmath	1.2.1
msgpack	1.0.3
multipledispatch	0.6.0
munkres	1.1.4
mypy-extensions	0.4.3
navigator-updater	0.3.0
nbclassic	0.5.2
nbclient	0.5.13
nbconvert	6.5.4
nbformat	5.7.0
nest-asyncio	1.5.6
networkx	2.8.4
nltk	3.7
notebook	6.5.2
notebook_shim	0.2.2
numba	0.56.4
numexpr	2.8.4
numpy	1.23.5
numpydoc	1.5.0
openpyxl	3.0.10
packaging	22.0
pandas	1.5.3
pandocfilters	1.5.0
panel	0.14.3
param	1.12.3
paramiko	2.8.1
parsel	1.6.0
parso	0.8.3
partd	1.2.0

pathlib	1.0.1
pathspec	0.10.3
patsy	0.5.3
pep8	1.7.1
pexpect	4.8.0
pickleshare	0.7.5
Pillow	9.4.0
pip	22.3.1
pkginfo	1.9.6
platformdirs	2.5.2
plotly	5.9.0
pluggy	1.0.0
ply	3.11
pooch	1.4.0
poyo	0.5.0
prometheus-client	0.14.1
prompt-toolkit	3.0.36
Protego	0.1.16
psutil	5.9.0
ptyprocess	0.7.0
pure-eval	0.2.2
py	1.11.0
pyasn1	0.4.8
pyasn1-modules	0.2.8
pycodestyle	2.10.0
pycosat	0.6.4
pycparser	2.21
pyct	0.5.0
pycurl	7.45.1
PyDispatcher	2.0.5
pydocstyle	6.3.0
pyerfa	2.0.0
pyflakes	3.0.1
Pygments	2.11.2
PyHamcrest	2.0.2
PyJWT	2.4.0
pylint	2.16.2
pylint-venv	2.3.0
pyls-spyder	0.4.0
PyNaCl	1.5.0
pyodbc	4.0.34
pyOpenSSL	23.0.0
pyparsing	3.0.9
PyQt5	5.15.7
PyQt5-sip	12.11.0
PyQtWebEngine	5.15.4
pyrsistent	0.18.0
PySocks	1.7.1
pytest	7.1.2
python-dateutil	2.8.2
python-lsp-black	1.2.1
python-lsp-jsonrpc	1.0.0
python-lsp-server	1.7.1
python-slugify	5.0.2
python-snappy	0.6.1
pytoolconfig	1.2.5
pytz	2022.7
pyviz-comms	2.0.2
PyWavelets	1.4.1
pywin32	305.1

```
pywin32-ctypes                0.2.0
pywinpty                      2.0.10
PyYAML                        6.0
pyzmq                         23.2.0
QDarkStyle                    3.0.2
qstylizer                     0.2.2
QtAwesome                     1.2.2
qtconsole                     5.4.0
QtPy                          2.2.0
queuelib                      1.5.0
regex                         2022.7.9
requests                      2.28.1
requests-file                 1.5.1
requests-toolbelt             0.9.1
retrying                      1.3.4
rope                          1.7.0
Rtree                         1.0.1
ruamel.yaml                   0.17.21
ruamel.yaml.clib              0.2.6
ruamel-yaml-conda             0.17.21
scikit-image                  0.19.3
scikit-learn                  1.2.1
scikit-learn-intelex          20230228.214818
scipy                         1.10.0
Scrapy                        2.8.0
seaborn                       0.12.2
Send2Trash                    1.8.0
service-identity              18.1.0
setuptools                    65.6.3
sip                           6.6.2
six                           1.16.0
smart-open                    5.2.1
sniffio                       1.2.0
snowballstemmer               2.2.0
sortedcontainers              2.4.0
soupsieve                     2.3.2.post1
Sphinx                        5.0.2
sphinxcontrib-applehelp       1.0.2
sphinxcontrib-devhelp         1.0.2
sphinxcontrib-htmlhelp        2.0.0
sphinxcontrib-jsmath          1.0.1
sphinxcontrib-qthelp          1.0.3
sphinxcontrib-serializinghtml 1.1.5
spyder                        5.4.1
spyder-kernels                2.4.1
SQLAlchemy                    1.4.39
stack-data                    0.2.0
statsmodels                   0.13.5
sympy                         1.11.1
tables                        3.7.0
tabulate                      0.8.10
TBB                           0.2
tblib                         1.7.0
tenacity                      8.0.1
terminado                     0.17.1
text-unidecode                1.3
textdistance                  4.2.1
threadpoolctl                 2.2.0
three-merge                   0.1.1
tifffile                      2021.7.2
```

```
tinycss2                    1.2.1
tldextract                  3.2.0
tokenizers                  0.11.4
toml                        0.10.2
tomli                       2.0.1
tomlkit                     0.11.1
toolz                       0.12.0
torch                       1.12.1
tornado                     6.1
tqdm                        4.64.1
traitlets                   5.7.1
transformers                4.24.0
Twisted                     22.2.0
twisted-iocpsupport         1.0.2
typing_extensions           4.4.0
ujson                       5.4.0
Unidecode                   1.2.0
urllib3                     1.26.14
w3lib                       1.21.0
watchdog                    2.1.6
wcwidth                     0.2.5
webencodings                0.5.1
websocket-client            0.58.0
Werkzeug                    2.2.2
whatthepatch                1.0.2
wheel                       0.38.4
widgetsnbextension          3.5.2
win-inet-pton               1.1.0
wincertstore                0.2
wrapt                       1.14.1
xarray                      2022.11.0
xgboost                     2.0.3
xlwings                     0.29.1
yapf                        0.31.0
zict                        2.1.0
zipp                        3.11.0
zope.interface              5.4.0
zstandard                   0.19.0
```

In [32]:
```
!pip install dash
```

```
Collecting dash
  Downloading dash-2.17.1-py3-none-any.whl (7.5 MB)
     ---------------------------------------- 7.5/7.5 MB 48.4 kB/s eta 0:00:00
Requirement already satisfied: typing-extensions>=4.1.1 in c:\users\vishal\anaconda3
\lib\site-packages (from dash) (4.4.0)
Requirement already satisfied: Flask<3.1,>=1.0.4 in c:\users\vishal\anaconda3\lib\sit
e-packages (from dash) (2.2.2)
Collecting retrying
  Downloading retrying-1.3.4-py3-none-any.whl (11 kB)
Collecting dash-html-components==2.0.0
  Downloading dash_html_components-2.0.0-py3-none-any.whl (4.1 kB)
Requirement already satisfied: nest-asyncio in c:\users\vishal\anaconda3\lib\site-pac
kages (from dash) (1.5.6)
Collecting dash-core-components==2.0.0
  Downloading dash_core_components-2.0.0-py3-none-any.whl (3.8 kB)
Requirement already satisfied: plotly>=5.0.0 in c:\users\vishal\anaconda3\lib\site-pa
ckages (from dash) (5.9.0)
Collecting dash-table==5.0.0
  Downloading dash_table-5.0.0-py3-none-any.whl (3.9 kB)
Requirement already satisfied: Werkzeug<3.1 in c:\users\vishal\anaconda3\lib\site-pac
kages (from dash) (2.2.2)
Requirement already satisfied: importlib-metadata in c:\users\vishal\anaconda3\lib\si
te-packages (from dash) (4.11.3)
Requirement already satisfied: requests in c:\users\vishal\anaconda3\lib\site-package
s (from dash) (2.28.1)
Requirement already satisfied: setuptools in c:\users\vishal\anaconda3\lib\site-packa
ges (from dash) (65.6.3)
Requirement already satisfied: Jinja2>=3.0 in c:\users\vishal\anaconda3\lib\site-pack
ages (from Flask<3.1,>=1.0.4->dash) (3.1.2)
Requirement already satisfied: click>=8.0 in c:\users\vishal\anaconda3\lib\site-packa
ges (from Flask<3.1,>=1.0.4->dash) (8.0.4)
Requirement already satisfied: itsdangerous>=2.0 in c:\users\vishal\anaconda3\lib\sit
e-packages (from Flask<3.1,>=1.0.4->dash) (2.0.1)
Requirement already satisfied: tenacity>=6.2.0 in c:\users\vishal\anaconda3\lib\site-
packages (from plotly>=5.0.0->dash) (8.0.1)
Requirement already satisfied: MarkupSafe>=2.1.1 in c:\users\vishal\anaconda3\lib\sit
e-packages (from Werkzeug<3.1->dash) (2.1.1)
Requirement already satisfied: zipp>=0.5 in c:\users\vishal\anaconda3\lib\site-packag
es (from importlib-metadata->dash) (3.11.0)
Requirement already satisfied: urllib3<1.27,>=1.21.1 in c:\users\vishal\anaconda3\lib
\site-packages (from requests->dash) (1.26.14)
Requirement already satisfied: certifi>=2017.4.17 in c:\users\vishal\anaconda3\lib\si
te-packages (from requests->dash) (2024.2.2)
Requirement already satisfied: charset-normalizer<3,>=2 in c:\users\vishal\anaconda3
\lib\site-packages (from requests->dash) (2.0.4)
Requirement already satisfied: idna<4,>=2.5 in c:\users\vishal\anaconda3\lib\site-pac
kages (from requests->dash) (3.4)
Requirement already satisfied: six>=1.7.0 in c:\users\vishal\anaconda3\lib\site-packa
ges (from retrying->dash) (1.16.0)
Requirement already satisfied: colorama in c:\users\vishal\anaconda3\lib\site-package
s (from click>=8.0->Flask<3.1,>=1.0.4->dash) (0.4.6)
Installing collected packages: dash-table, dash-html-components, dash-core-component
s, retrying, dash
Successfully installed dash-2.17.1 dash-core-components-2.0.0 dash-html-components-2.
0.0 dash-table-5.0.0 retrying-1.3.4
```

In [82]:

```
import dash
from dash import dcc, html
from dash.dependencies import Input, Output
```

```
print("Dash installed successfully!")
```

```
Dash installed successfully!
```

In [83]:
```
import dash
from dash import dcc, html
from dash.dependencies import Input, Output
```

In [84]:
```
# Sample DataFrame
data = pd.DataFrame({
    'age': [25, 40, 55, 70, 35],
    'target': [1, 0, 1, 0, 1],
    'age_group': ['0-30', '31-45', '46-60', '61+', '31-45'],
    'maximum_heart_rate': [180, 150, 160, 140, 170]
})
```

In [85]:
```
# Initialize the Dash app
app = dash.Dash(__name__)
```

In [86]:
```
# Layout of the Dash app
app.layout = html.Div([
    dcc.Checklist(
        id='age-group-filter',
        options=[
            {'label': '0-30', 'value': '0-30'},
            {'label': '31-45', 'value': '31-45'},
            {'label': '46-60', 'value': '46-60'},
            {'label': '61+', 'value': '61+'}
        ],
        value=['0-30', '31-45', '46-60', '61+']
    ),
    dcc.Graph(id='age-maxhr-scatter')
])
```

In [87]:
```
# Callback to update graph
@app.callback(
    Output('age-maxhr-scatter', 'figure'),
    Input('age-group-filter', 'value')
)
def update_graph(selected_age_groups):
    filtered_data = data[data['age_group'].isin(selected_age_groups)]
    fig = px.scatter(filtered_data, x='age', y='maximum_heart_rate', color='target')
    return fig
```

In [88]:
```
# Run the server
if __name__ == '__main__':
    app.run_server(debug=True)
```

KeyMatrics and Relationships

In [43]:
```
from sklearn.ensemble import RandomForestClassifier
from sklearn.model_selection import train_test_split
from sklearn.preprocessing import StandardScaler
```

In [44]:
```
X = data.drop(['target', 'age_group'], axis=1)
X = pd.get_dummies(X, drop_first=True)  # Convert categorical variables to numerical
y = data['target']
```

In [45]:
```
# Train/Test Split
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2, random_state=
```

In [46]:
```
# Standardize the features
scaler = StandardScaler()
```

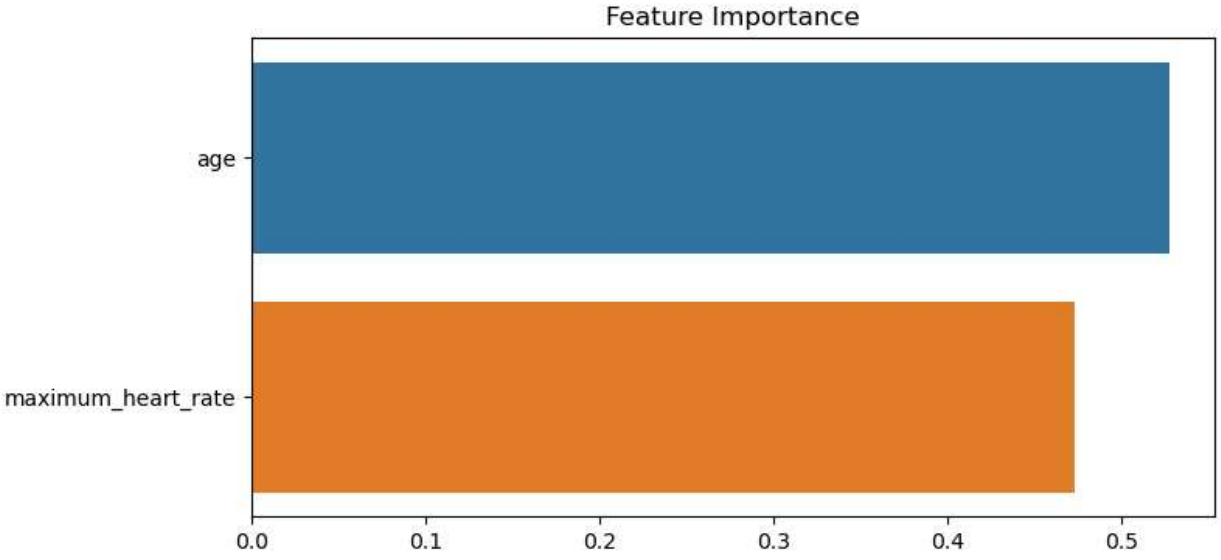
```
X_train_scaled = scaler.fit_transform(X_train)
X_test_scaled = scaler.transform(X_test)
```

In [47]:
```
# Train the model
model = RandomForestClassifier()
model.fit(X_train_scaled, y_train)
```

Out[47]:
```
▾ RandomForestClassifier
RandomForestClassifier()
```

In [48]:
```
# Feature importance
feature_importance = model.feature_importances_
features = X.columns
```

In [50]:
```
# Plot feature importance
plt.figure(figsize=(8, 4))
sns.barplot(x=feature_importance, y=features)
plt.title('Feature Importance')
plt.show()
```



In [89]:
```
pip install nbconvert
```

```
Requirement already satisfied: nbconvert in c:\users\vishal\anaconda3\lib\site-packag
es (6.5.4)
Requirement already satisfied: jinja2>=3.0 in c:\users\vishal\anaconda3\lib\site-pack
ages (from nbconvert) (3.1.2)
Requirement already satisfied: jupyter-core>=4.7 in c:\users\vishal\anaconda3\lib\sit
e-packages (from nbconvert) (5.2.0)
Requirement already satisfied: packaging in c:\users\vishal\anaconda3\lib\site-packag
es (from nbconvert) (22.0)
Requirement already satisfied: nbformat>=5.1 in c:\users\vishal\anaconda3\lib\site-pa
ckages (from nbconvert) (5.7.0)
Requirement already satisfied: tinycss2 in c:\users\vishal\anaconda3\lib\site-package
s (from nbconvert) (1.2.1)
Requirement already satisfied: nbclient>=0.5.0 in c:\users\vishal\anaconda3\lib\site-
packages (from nbconvert) (0.5.13)
Requirement already satisfied: jupyterlab-pygments in c:\users\vishal\anaconda3\lib\s
ite-packages (from nbconvert) (0.1.2)
Requirement already satisfied: mistune<2,>=0.8.1 in c:\users\vishal\anaconda3\lib\sit
e-packages (from nbconvert) (0.8.4)
Requirement already satisfied: defusedxml in c:\users\vishal\anaconda3\lib\site-packa
ges (from nbconvert) (0.7.1)
Requirement already satisfied: MarkupSafe>=2.0 in c:\users\vishal\anaconda3\lib\site-
packages (from nbconvert) (2.1.1)
Requirement already satisfied: pandocfilters>=1.4.1 in c:\users\vishal\anaconda3\lib
\site-packages (from nbconvert) (1.5.0)
Requirement already satisfied: lxml in c:\users\vishal\anaconda3\lib\site-packages (f
rom nbconvert) (4.9.1)
Requirement already satisfied: traitlets>=5.0 in c:\users\vishal\anaconda3\lib\site-p
ackages (from nbconvert) (5.7.1)
Requirement already satisfied: entrypoints>=0.2.2 in c:\users\vishal\anaconda3\lib\si
te-packages (from nbconvert) (0.4)
Requirement already satisfied: beautifulsoup4 in c:\users\vishal\anaconda3\lib\site-p
ackages (from nbconvert) (4.11.1)
Requirement already satisfied: pygments>=2.4.1 in c:\users\vishal\anaconda3\lib\site-
packages (from nbconvert) (2.11.2)
Requirement already satisfied: bleach in c:\users\vishal\anaconda3\lib\site-packages
(from nbconvert) (4.1.0)
Requirement already satisfied: pywin32>=1.0 in c:\users\vishal\anaconda3\lib\site-pac
kages (from jupyter-core>=4.7->nbconvert) (305.1)
Requirement already satisfied: platformdirs>=2.5 in c:\users\vishal\anaconda3\lib\sit
e-packages (from jupyter-core>=4.7->nbconvert) (2.5.2)
Requirement already satisfied: nest-asyncio in c:\users\vishal\anaconda3\lib\site-pac
kages (from nbclient>=0.5.0->nbconvert) (1.5.6)
Requirement already satisfied: jupyter-client>=6.1.5 in c:\users\vishal\anaconda3\lib
\site-packages (from nbclient>=0.5.0->nbconvert) (7.3.4)
Requirement already satisfied: jsonschema>=2.6 in c:\users\vishal\anaconda3\lib\site-
packages (from nbformat>=5.1->nbconvert) (4.17.3)
Requirement already satisfied: fastjsonschema in c:\users\vishal\anaconda3\lib\site-p
ackages (from nbformat>=5.1->nbconvert) (2.16.2)
Requirement already satisfied: soupsieve>1.2 in c:\users\vishal\anaconda3\lib\site-pa
ckages (from beautifulsoup4->nbconvert) (2.3.2.post1)
Requirement already satisfied: webencodings in c:\users\vishal\anaconda3\lib\site-pac
kages (from bleach->nbconvert) (0.5.1)
Requirement already satisfied: six>=1.9.0 in c:\users\vishal\anaconda3\lib\site-packa
ges (from bleach->nbconvert) (1.16.0)
Requirement already satisfied: attrs>=17.4.0 in c:\users\vishal\anaconda3\lib\site-pa
ckages (from jsonschema>=2.6->nbformat>=5.1->nbconvert) (22.1.0)
Requirement already satisfied: pyrsistent!=0.17.0,!=0.17.1,!=0.17.2,>=0.14.0 in c:\us
ers\vishal\anaconda3\lib\site-packages (from jsonschema>=2.6->nbformat>=5.1->nbconver
t) (0.18.0)
Requirement already satisfied: tornado>=6.0 in c:\users\vishal\anaconda3\lib\site-pac
```

```
kages (from jupyter-client>=6.1.5->nbclient>=0.5.0->nbconvert) (6.1)
Requirement already satisfied: python-dateutil>=2.8.2 in c:\users\vishal\anaconda3\li
b\site-packages (from jupyter-client>=6.1.5->nbclient>=0.5.0->nbconvert) (2.8.2)
Requirement already satisfied: pyzmq>=23.0 in c:\users\vishal\anaconda3\lib\site-pack
ages (from jupyter-client>=6.1.5->nbclient>=0.5.0->nbconvert) (23.2.0)
Note: you may need to restart the kernel to use updated packages.
```

In [ ]: