```
import tensorflow as tf
import numpy as np
import cv2
import matplotlib.pyplot as plt

# Load the DeepLabV3 model from TensorFlow Lite file
model_path = 'deeplabv3_mnv2_pascal_train_aug_2018_01_29.tflite'
interpreter = tf.lite.Interpreter(model_path=model_path)
interpreter.allocate_tensors()

# Get input and output details
input_details = interpreter.get_input_details()
output_details = interpreter.get_output_details()

# Load and preprocess the image
image_path = 'mi25.png'
original_image = cv2.imread(image_path)
height, width, _ = original_image.shape

# Resize image to fit model input size
img = tf.keras.preprocessing.image.load_img(image_path,
target_size=(513, 513))
img_array = tf.keras.preprocessing.image.img_to_array(img)
img_array = np.expand_dims(img_array, axis=0)
img_array = tf.image.convert_image_dtype(img_array, tf.uint8)

# Set input tensor
interpreter.set_tensor(input_details[0]['index'], img_array)

# Perform inference
interpreter.invoke()

# Get segmentation map from output tensor
segmentation_map = interpreter.get_tensor(output_details[0]['index'])
[0]

# Resize segmentation map to original image size
segmentation_map = tf.image.resize(segmentation_map, (height, width))
segmentation_map = tf.argmax(segmentation_map, axis=-1).numpy()

# Calculate the percentage of each class in the segmentation map
unique, counts = np.unique(segmentation_map, return_counts=True)
class_percentages = dict(zip(unique, counts / segmentation_map.size *
100))

# Find the class with the highest percentage
max_class_id = max(class_percentages, key=class_percentages.get)
max_percentage = class_percentages[max_class_id]

# Print the result
```

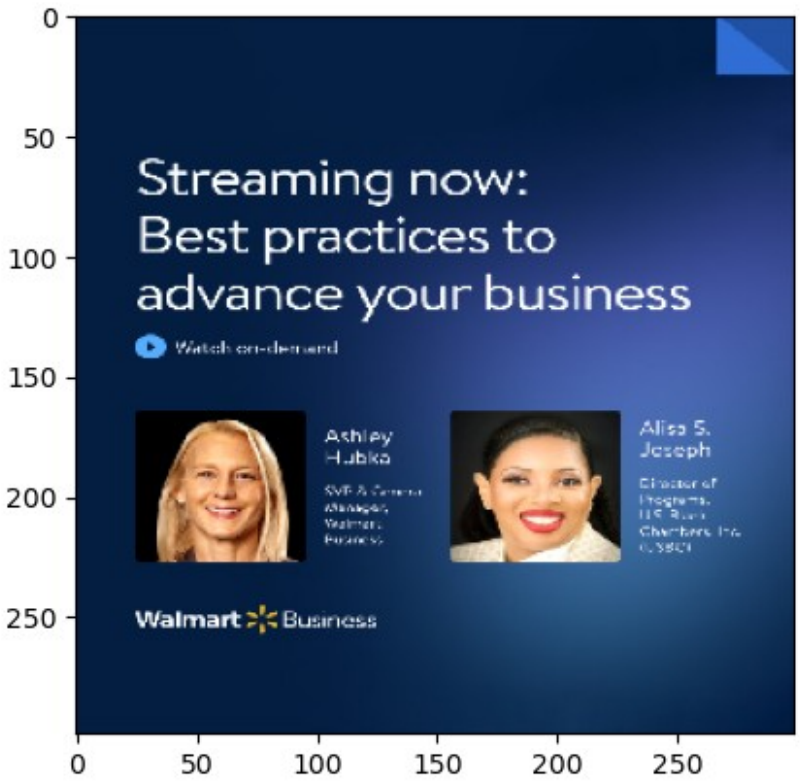
```
print(f"Class with highest segmentation: {max_class_id}")
print(f"Percentage of semantic segmentation for class {max_class_id}:
{max_percentage:.2f}%")

# Optionally, visualize the segmentation map
plt.figure(figsize=(10, 5))
plt.subplot(1, 2, 1)
plt.imshow(cv2.cvtColor(original_image, cv2.COLOR_BGR2RGB))
plt.title("Original Image")
plt.axis("off")

plt.subplot(1, 2, 2)
plt.imshow(segmentation_map, cmap='jet')
plt.title("Segmentation Map")
plt.axis("off")

plt.show()
```

```
---------------------------------------------------------------------------
-----
ValueError                                Traceback (most recent call
last)
Cell In[40], line 8
      6 # Load the DeepLabV3 model from TensorFlow Lite file
      7 model_path =
'deeplabv3_mnv2_pascal_train_aug_2018_01_29.tflite'
----> 8 interpreter = tf.lite.Interpreter(model_path=model_path)
      9 interpreter.allocate_tensors()
     11 # Get input and output details

File ~\anaconda3\Lib\site-packages\tensorflow\lite\python\
interpreter.py:464, in Interpreter.__init__(self, model_path,
model_content, experimental_delegates, num_threads,
experimental_op_resolver_type, experimental_preserve_all_tensors,
experimental_disable_delegate_clustering)
    458 custom_op_registerers_by_name = [
    459     x for x in self._custom_op_registerers if isinstance(x,
str)
    460 ]
    461 custom_op_registerers_by_func = [
    462     x for x in self._custom_op_registerers if not
isinstance(x, str)
    463 ]
--> 464 self._interpreter =
_interpreter_wrapper.CreateWrapperFromFile(
    465     model_path,
    466     op_resolver_id,
    467     custom_op_registerers_by_name,
    468     custom_op_registerers_by_func,
    469     experimental_preserve_all_tensors,
```

```
    470     experimental_disable_delegate_clustering,
    471 )
    472 if not self._interpreter:
    473   raise ValueError('Failed to open {}'.format(model_path))

ValueError: Could not open
'deeplabv3_mnv2_pascal_train_aug_2018_01_29.tflite'.
```

```python
import tensorflow as tf
import cv2
import numpy as np

# Load the pre-trained InceptionV3 model
model = tf.keras.applications.InceptionV3(weights='imagenet')

# Load and preprocess the image
image_path = 'wm20.png'
img = tf.keras.preprocessing.image.load_img(image_path,
target_size=(299, 299))
img_array = tf.keras.preprocessing.image.img_to_array(img)
img_array = np.expand_dims(img_array, axis=0)
img_array =
tf.keras.applications.inception_v3.preprocess_input(img_array)

# Get predictions
predictions = model.predict(img_array)

# Decode predictions
decode_predictions =
tf.keras.applications.inception_v3.decode_predictions(predictions)

# Print top predictions
for i, (imagenet_id, label, score) in
enumerate(decode_predictions[0]):
    print(f"{i + 1}: {label} ({score:.2f})")
# Optionally, you can display the image
import matplotlib.pyplot as plt
plt.imshow(img)
plt.show()
```

```
1/1 ━━━━━━━━━━━━━━━━━━━━ 7s 7s/step
1: web_site (0.85)
2: brass (0.00)
3: menu (0.00)
4: tiger_beetle (0.00)
5: alp (0.00)
```



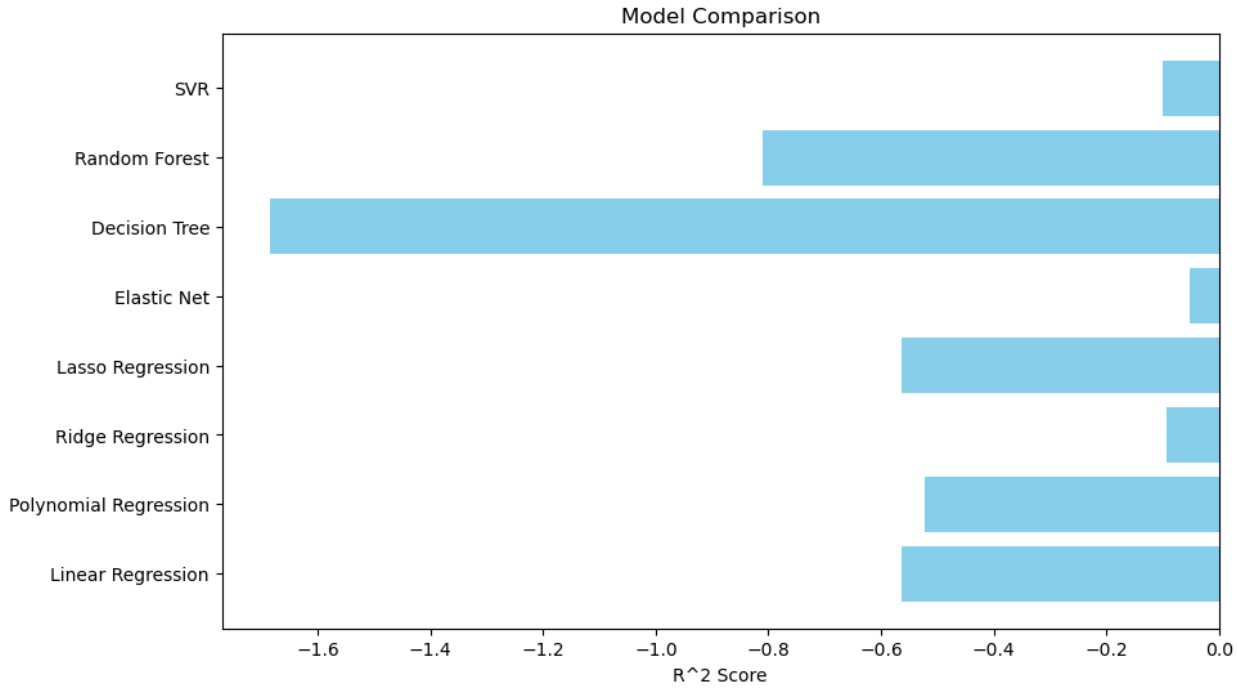

```
import tensorflow as tf
import numpy as np

# Load the pre-trained DenseNet201 model
model = tf.keras.applications.DenseNet201(weights='imagenet')

# Load and preprocess the image
image_path = 'wm20.png'
img = tf.keras.preprocessing.image.load_img(image_path,
target_size=(224, 224))
img_array = tf.keras.preprocessing.image.img_to_array(img)
img_array = np.expand_dims(img_array, axis=0)
img_array = tf.keras.applications.densenet.preprocess_input(img_array)

# Get predictions
predictions = model.predict(img_array)

# Decode predictions
decode_predictions =
tf.keras.applications.densenet.decode_predictions(predictions, top=1)
[0][0]

# Print the top prediction
imagenet_id, label, score = decode_predictions
print(f"Prediction: {label} ({score:.2f})")
```

```
1/1 ━━━━━━━━━━━━━━━━━━━━ 16s 16s/step
Prediction: web_site (0.89)
```

```
import pandas as pd
import numpy as np
from sklearn.model_selection import train_test_split, cross_val_score
from sklearn.linear_model import LinearRegression, Ridge, Lasso,
ElasticNet
from sklearn.preprocessing import PolynomialFeatures
from sklearn.pipeline import make_pipeline
from sklearn.tree import DecisionTreeRegressor
from sklearn.ensemble import RandomForestRegressor
from sklearn.svm import SVR
from sklearn.metrics import mean_squared_error, r2_score
import matplotlib.pyplot as plt

# Load the dataset
file_path = 'C:/Users/Medhavi/photodataset.xlsx'
df = pd.read_excel(file_path)


# Define dependent and independent variables
X = df[['semantic_seg_perc', 'max_fine_recog', 'similarity']]
y = df['total_engage']  # Assuming this is the column name

# Split the data into training and testing sets
X_train, X_test, y_train, y_test = train_test_split(X, y,
test_size=0.1, random_state=42)

# Function to evaluate models
def evaluate_model(model):
    model.fit(X_train, y_train)
    y_pred = model.predict(X_test)
    mse = mean_squared_error(y_test, y_pred)
    r2 = r2_score(y_test, y_pred)
    return mse, r2

# Linear Regression
lr = LinearRegression()
mse_lr, r2_lr = evaluate_model(lr)

# Polynomial Regression (degree=2)
poly = make_pipeline(PolynomialFeatures(degree=2), LinearRegression())
mse_poly, r2_poly = evaluate_model(poly)

# Ridge Regression
ridge = Ridge(alpha=1.0)
mse_ridge, r2_ridge = evaluate_model(ridge)

# Lasso Regression
```

```
lasso = Lasso(alpha=0.1)
mse_lasso, r2_lasso = evaluate_model(lasso)

# Elastic Net
elastic_net = ElasticNet(alpha=0.1, l1_ratio=0.5)
mse_en, r2_en = evaluate_model(elastic_net)

# Decision Tree
dt = DecisionTreeRegressor(random_state=42)
mse_dt, r2_dt = evaluate_model(dt)

# Random Forest
rf = RandomForestRegressor(n_estimators=100, random_state=42)
mse_rf, r2_rf = evaluate_model(rf)

# Support Vector Regression
svr = SVR(kernel='linear')
mse_svr, r2_svr = evaluate_model(svr)

# Print the results
models = ['Linear Regression', 'Polynomial Regression', 'Ridge
Regression', 'Lasso Regression', 'Elastic Net', 'Decision Tree',
'Random Forest', 'SVR']
mse_scores = [mse_lr, mse_poly, mse_ridge, mse_lasso, mse_en, mse_dt,
mse_rf, mse_svr]
r2_scores = [r2_lr, r2_poly, r2_ridge, r2_lasso, r2_en, r2_dt, r2_rf,
r2_svr]

for model, mse, r2 in zip(models, mse_scores, r2_scores):
    print(f"{model}: MSE = {mse:.2f}, R^2 = {r2:.2f}")

# Optional: Plot the results
plt.figure(figsize=(10, 6))
plt.barh(models, r2_scores, color='skyblue')
plt.xlabel('R^2 Score')
plt.title('Model Comparison')
plt.show()
```

```
Linear Regression: MSE = 4127569.21, R^2 = -0.56
Polynomial Regression: MSE = 4019464.31, R^2 = -0.52
Ridge Regression: MSE = 2886188.09, R^2 = -0.09
Lasso Regression: MSE = 4125781.94, R^2 = -0.56
Elastic Net: MSE = 2778119.35, R^2 = -0.05
Decision Tree: MSE = 7090142.05, R^2 = -1.69
Random Forest: MSE = 4775736.71, R^2 = -0.81
SVR: MSE = 2901835.27, R^2 = -0.10
```




```
def print_equation(model, features):
    if isinstance(model, LinearRegression):
        print("Linear Regression Equation:")
        print("Y =", model.intercept_, "+", " + ".join([f"({coef:.2f}
* {feat})" for coef, feat in zip(model.coef_, features)]))
    elif isinstance(model, Ridge) or isinstance(model, Lasso) or
isinstance(model, ElasticNet):
        print("Regularized Regression Equation:")
        print("Y =", model.intercept_, "+", " + ".join([f"({coef:.2f}
* {feat})" for coef, feat in zip(model.coef_, features)]))
    elif isinstance(model, PolynomialFeatures):
        print("Polynomial Regression Equation:")
        print("Y =", " + ".join([f"({coef:.2f} * {feat})" for coef,
feat in zip(model[1:].coef_[0], features)]))
    else:
        print("Equation not available for this model")
models = [
    LinearRegression(),
    make_pipeline(PolynomialFeatures(degree=2), LinearRegression()),
    Ridge(alpha=1.0),
    Lasso(alpha=0.1),
    ElasticNet(alpha=0.1, l1_ratio=0.5),
    DecisionTreeRegressor(random_state=42),
    RandomForestRegressor(n_estimators=100, random_state=42),
    SVR(kernel='linear')
]

# Train and print equations
```

```
for model in models:
    model.fit(X_train, y_train)
    y_pred = model.predict(X_test)
    print_equation(model, X.columns)
    print()
```

```
Linear Regression Equation:
Y = -6905.7624502963545 + (1373.74 * semantic_seg_perc) + (-357.86 *
max_fine_recog) + (43886.96 * similarity)

Equation not available for this model

Regularized Regression Equation:
Y = -2395.8245882024157 + (1338.93 * semantic_seg_perc) + (-981.94 *
max_fine_recog) + (20233.64 * similarity)

Regularized Regression Equation:
Y = -6901.981613450701 + (1371.83 * semantic_seg_perc) + (-356.67 *
max_fine_recog) + (43867.66 * similarity)

Regularized Regression Equation:
Y = 701.879821201625 + (756.07 * semantic_seg_perc) + (-849.10 *
max_fine_recog) + (4011.54 * similarity)

Equation not available for this model

Equation not available for this model

Equation not available for this model
```

```
import pandas as pd
import numpy as np
from sklearn.model_selection import train_test_split
from sklearn.linear_model import LinearRegression, Ridge, Lasso,
ElasticNet
from sklearn.preprocessing import PolynomialFeatures
from sklearn.pipeline import make_pipeline
from sklearn.tree import DecisionTreeRegressor
from sklearn.ensemble import RandomForestRegressor
from sklearn.svm import SVR
from sklearn.metrics import mean_squared_error, r2_score,
accuracy_score, precision_score, recall_score, f1_score
models = [
    LinearRegression(),
    make_pipeline(PolynomialFeatures(degree=2), LinearRegression()),
    Ridge(alpha=1.0),
    Lasso(alpha=0.1),
    ElasticNet(alpha=0.1, l1_ratio=0.5),
    DecisionTreeRegressor(random_state=42),
```

```
    RandomForestRegressor(n_estimators=100, random_state=42),
    SVR(kernel='linear')
]

# Train models and print evaluation metrics
for model in models:
    model.fit(X_train, y_train)
    y_pred = model.predict(X_test)
    print("Model:", type(model).__name__)
    print("R-squared:", r2_score(y_test, y_pred))
    print("Mean Squared Error:", mean_squared_error(y_test, y_pred))
    print()

    # Convert regression predictions to classification labels
    y_pred_class = np.round(y_pred)

    # Calculate classification metrics
    print("Classification Metrics:")
    print("Accuracy:", accuracy_score(y_test, y_pred_class))
    print("Precision:", precision_score(y_test, y_pred_class,
average='weighted'))
    print("Recall:", recall_score(y_test, y_pred_class,
average='weighted'))
    print("F1 Score:", f1_score(y_test, y_pred_class,
average='weighted'))
    print("--------------------------------------")
```

```
Model: LinearRegression
R-squared: -0.5636086165782257
Mean Squared Error: 4127569.2130202493

Classification Metrics:
Accuracy: 0.0
Precision: 0.0
Recall: 0.0
F1 Score: 0.0
--------------------------------------
Model: Pipeline
R-squared: -0.5226562444031144
Mean Squared Error: 4019464.3146473775

Classification Metrics:
Accuracy: 0.0
Precision: 0.0
Recall: 0.0
F1 Score: 0.0
--------------------------------------
Model: Ridge
R-squared: -0.09334776187780669
Mean Squared Error: 2886188.086458179
```

```
Classification Metrics:
Accuracy: 0.0
Precision: 0.0
Recall: 0.0
F1 Score: 0.0
--------------------------------------
Model: Lasso
R-squared: -0.5629315621108244
Mean Squared Error: 4125781.9440415846

Classification Metrics:
Accuracy: 0.0
Precision: 0.0
Recall: 0.0
F1 Score: 0.0
--------------------------------------
Model: ElasticNet
R-squared: -0.052409088430919626
Mean Squared Error: 2778119.3495954676

Classification Metrics:
Accuracy: 0.0
Precision: 0.0
Recall: 0.0
F1 Score: 0.0
--------------------------------------
Model: DecisionTreeRegressor
R-squared: -1.6858925023407516
Mean Squared Error: 7090142.05

Classification Metrics:
Accuracy: 0.0
Precision: 0.0
Recall: 0.0
F1 Score: 0.0
--------------------------------------

C:\Users\Medhavi\anaconda3\Lib\site-packages\sklearn\metrics\
_classification.py:1344: UndefinedMetricWarning: Precision is ill-
defined and being set to 0.0 in labels with no predicted samples. Use
`zero_division` parameter to control this behavior.
  _warn_prf(average, modifier, msg_start, len(result))
C:\Users\Medhavi\anaconda3\Lib\site-packages\sklearn\metrics\
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```

```
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C:\Users\Medhavi\anaconda3\Lib\site-packages\sklearn\metrics\
_classification.py:1344: UndefinedMetricWarning: Recall is ill-defined
and being set to 0.0 in labels with no true samples. Use
`zero_division` parameter to control this behavior.
  _warn_prf(average, modifier, msg_start, len(result))
```

```
Model: RandomForestRegressor
R-squared: -0.8091478750750432
Mean Squared Error: 4775736.710445

Classification Metrics:
Accuracy: 0.0
Precision: 0.0
Recall: 0.0
F1 Score: 0.0
--------------------------------------
Model: SVR
R-squared: -0.09927523923865134
Mean Squared Error: 2901835.271313836

Classification Metrics:
Accuracy: 0.0
Precision: 0.0
Recall: 0.0
F1 Score: 0.0
--------------------------------------

C:\Users\Medhavi\anaconda3\Lib\site-packages\sklearn\metrics\
_classification.py:1344: UndefinedMetricWarning: Precision is ill-
defined and being set to 0.0 in labels with no predicted samples. Use
`zero_division` parameter to control this behavior.
  _warn_prf(average, modifier, msg_start, len(result))
C:\Users\Medhavi\anaconda3\Lib\site-packages\sklearn\metrics\
_classification.py:1344: UndefinedMetricWarning: Recall is ill-defined
and being set to 0.0 in labels with no true samples. Use
`zero_division` parameter to control this behavior.
  _warn_prf(average, modifier, msg_start, len(result))
C:\Users\Medhavi\anaconda3\Lib\site-packages\sklearn\metrics\
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  _warn_prf(average, modifier, msg_start, len(result))
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_classification.py:1344: UndefinedMetricWarning: Recall is ill-defined
and being set to 0.0 in labels with no true samples. Use
`zero_division` parameter to control this behavior.
  _warn_prf(average, modifier, msg_start, len(result))
```

```python
import pandas as pd
import numpy as np
from sklearn.model_selection import train_test_split
from sklearn.linear_model import PoissonRegressor
from sklearn.pipeline import make_pipeline
from sklearn.preprocessing import PolynomialFeatures
from sklearn.metrics import mean_squared_error, r2_score
```

```
# Function to print equation
def print_equation(model, features):
    if isinstance(model, PoissonRegressor):
        print("Poisson Regression Equation:")
        print("log(Y) =", model.intercept_, "+", " +
".join([f"({coef:.2f} * {feat})" for coef, feat in zip(model.coef_,
features)]))
    else:
        print("Equation not available for this model")

# Models
models = [
    PoissonRegressor(),
]

# Train and print equations
for model in models:
    model.fit(X_train, y_train)
    y_pred = model.predict(X_test)
    print_equation(model, X.columns)
    print()
import pandas as pd
import numpy as np
from sklearn.model_selection import train_test_split
import statsmodels.api as sm
from statsmodels.formula.api import poisson, glm
from statsmodels.genmod.families import Poisson, NegativeBinomial
from sklearn.metrics import mean_squared_error, r2_score

# Function to print model summary and equation
def print_model_summary(model):
    print(model.summary())
    params = model.params
    equation = "Y = " + " + ".join([f"({params[i]:.4f} *
{X.columns[i]})" for i in range(len(params))])
    print("Equation:", equation)
# Predict and evaluate Poisson Regression
poisson_model=PoissonRegressor()
X = sm.add_constant(X)
poisson_model.fit(X_train, y_train)
y_pred = model.predict(X_test)
poisson_predictions = poisson_model.predict(X_test)
poisson_mse = mean_squared_error(y_test, poisson_predictions)
poisson_r2 = r2_score(y_test, poisson_predictions)
print(f"Poisson Regression MSE: {poisson_mse:.4f}")
print(f"Poisson Regression R^2: {poisson_r2:.4f}")
print("\n")

Poisson Regression Equation:
log(Y) = 5.617310772456509 + (-0.00 * const) + (1.93 *
```

```
semantic_seg_perc) + (-0.96 * max_fine_recog) + (4.67 * similarity)

Poisson Regression MSE: 2655751.5051
Poisson Regression R^2: -0.2886
```

```
import pandas as pd
import numpy as np
from sklearn.model_selection import train_test_split
from sklearn.linear_model import LogisticRegression
from sklearn.ensemble import GradientBoostingClassifier,
RandomForestClassifier, VotingClassifier
from sklearn.metrics import accuracy_score, mean_squared_error,
r2_score
import statsmodels.api as sm


# Define the feature matrix X and target vector y
X = df[['semantic_seg_perc', 'max_fine_recog', 'similarity']]
y = df['total_engage']  # Assuming 'engagement_class' is the target
variable

# Transform the target variable into binary classes
# For demonstration, let's assume we classify based on median
engagement
median_engagement = y.median()
y_binary = (y > median_engagement).astype(int)

# Split the data into training and testing sets
X_train, X_test, y_train, y_test = train_test_split(X, y_binary,
test_size=0.2, random_state=42)

# Logistic Regression
log_reg = LogisticRegression()
log_reg.fit(X_train, y_train)
y_pred_log_reg = log_reg.predict(X_test)

log_reg_accuracy = accuracy_score(y_test, y_pred_log_reg)
log_reg_mse = mean_squared_error(y_test, y_pred_log_reg)
log_reg_r2 = r2_score(y_test, y_pred_log_reg)

print("Logistic Regression:")
print(f"Accuracy: {log_reg_accuracy:.4f}")
print(f"MSE: {log_reg_mse:.4f}")
print(f"R^2: {log_reg_r2:.4f}")

# Logistic Regression using statsmodels to print the equation
log_reg_sm = sm.Logit(y_train, sm.add_constant(X_train)).fit()
print(log_reg_sm.summary())
```

```python
# Gradient Boosting Classifier
gb_clf = GradientBoostingClassifier()
gb_clf.fit(X_train, y_train)
y_pred_gb = gb_clf.predict(X_test)

gb_accuracy = accuracy_score(y_test, y_pred_gb)
gb_mse = mean_squared_error(y_test, y_pred_gb)
gb_r2 = r2_score(y_test, y_pred_gb)

print("Gradient Boosting Classifier:")
print(f"Accuracy: {gb_accuracy:.4f}")
print(f"MSE: {gb_mse:.4f}")
print(f"R^2: {gb_r2:.4f}")

# Random Forest Classifier
rf_clf = RandomForestClassifier()
rf_clf.fit(X_train, y_train)
y_pred_rf = rf_clf.predict(X_test)

rf_accuracy = accuracy_score(y_test, y_pred_rf)
rf_mse = mean_squared_error(y_test, y_pred_rf)
rf_r2 = r2_score(y_test, y_pred_rf)

print("Random Forest Classifier:")
print(f"Accuracy: {rf_accuracy:.4f}")
print(f"MSE: {rf_mse:.4f}")
print(f"R^2: {rf_r2:.4f}")

# Ensemble Method (Voting Classifier)
voting_clf = VotingClassifier(estimators=[
    ('log_reg', log_reg),
    ('gb_clf', gb_clf),
    ('rf_clf', rf_clf)],
    voting='soft')
voting_clf.fit(X_train, y_train)
y_pred_voting = voting_clf.predict(X_test)

voting_accuracy = accuracy_score(y_test, y_pred_voting)
voting_mse = mean_squared_error(y_test, y_pred_voting)
voting_r2 = r2_score(y_test, y_pred_voting)

print("Ensemble Voting Classifier:")
print(f"Accuracy: {voting_accuracy:.4f}")
print(f"MSE: {voting_mse:.4f}")
print(f"R^2: {voting_r2:.4f}")
```

```
Logistic Regression:
Accuracy: 0.4615
MSE: 0.5385
R^2: -1.1667
```

```
Optimization terminated successfully.
         Current function value: 0.618116
         Iterations 6
                           Logit Regression Results

==============================================================================
========
Dep. Variable:           total_engage   No. Observations:
152
Model:                          Logit   Df Residuals:
148
Method:                           MLE   Df Model:
3
Date:                Tue, 28 May 2024   Pseudo R-squ.:
0.1081
Time:                        22:34:14   Log-Likelihood:
-93.954
converged:                       True   LL-Null:
-105.35
Covariance Type:            nonrobust   LLR p-value:
4.481e-05
==============================================================================
===============
                         coef    std err          z      P>|z|
[0.025      0.975]
------------------------------------------------------------------------------
---------------
const                -4.3246      1.165     -3.714      0.000      -
6.607      -2.042
semantic_seg_perc     0.5906      0.702      0.841      0.400      -
0.786       1.967
max_fine_recog       -0.3754      0.653     -0.575      0.565      -
1.656       0.905
similarity           24.4115      6.115      3.992      0.000
12.427      36.396
==============================================================================
===============
Gradient Boosting Classifier:
Accuracy: 0.7692
MSE: 0.2308
R^2: 0.0714
Random Forest Classifier:
Accuracy: 0.7179
MSE: 0.2821
R^2: -0.1349
Ensemble Voting Classifier:
Accuracy: 0.7692
MSE: 0.2308
R^2: 0.0714
```

```
import pandas as pd
import numpy as np
from sklearn.model_selection import train_test_split
from sklearn.linear_model import LogisticRegression
from sklearn.ensemble import GradientBoostingClassifier,
RandomForestClassifier, VotingClassifier
from sklearn.metrics import accuracy_score, mean_squared_error,
r2_score
import statsmodels.api as sm

# Transform the target variable into binary classes
# For demonstration, let's assume we classify based on median
engagement
median_engagement = y.median()
y_binary = (y > median_engagement).astype(int)

# Split the data into training and testing sets
X_train, X_test, y_train, y_test = train_test_split(X, y_binary,
test_size=0.2, random_state=42)

# Logistic Regression
log_reg = LogisticRegression()
log_reg.fit(X_train, y_train)
y_pred_log_reg = log_reg.predict(X_test)

log_reg_accuracy = accuracy_score(y_test, y_pred_log_reg)
log_reg_mse = mean_squared_error(y_test, y_pred_log_reg)
log_reg_r2 = r2_score(y_test, y_pred_log_reg)

print("Logistic Regression:")
print(f"Accuracy: {log_reg_accuracy:.4f}")
print(f"MSE: {log_reg_mse:.4f}")
print(f"R^2: {log_reg_r2:.4f}")

# Logistic Regression using statsmodels to print the equation
log_reg_sm = sm.Logit(y_train, sm.add_constant(X_train)).fit()
print(log_reg_sm.summary())

# Gradient Boosting Classifier
gb_clf = GradientBoostingClassifier()
gb_clf.fit(X_train, y_train)
y_pred_gb = gb_clf.predict(X_test)

gb_accuracy = accuracy_score(y_test, y_pred_gb)
gb_mse = mean_squared_error(y_test, y_pred_gb)
gb_r2 = r2_score(y_test, y_pred_gb)

print("Gradient Boosting Classifier:")
print(f"Accuracy: {gb_accuracy:.4f}")
print(f"MSE: {gb_mse:.4f}")
print(f"R^2: {gb_r2:.4f}")
```

```python
# Feature importance for Gradient Boosting
gb_feature_importance = gb_clf.feature_importances_
print("Gradient Boosting Feature Importances:")
for feature, importance in zip(X.columns, gb_feature_importance):
    print(f"{feature}: {importance:.4f}")

# Random Forest Classifier
rf_clf = RandomForestClassifier()
rf_clf.fit(X_train, y_train)
y_pred_rf = rf_clf.predict(X_test)

rf_accuracy = accuracy_score(y_test, y_pred_rf)
rf_mse = mean_squared_error(y_test, y_pred_rf)
rf_r2 = r2_score(y_test, y_pred_rf)

print("Random Forest Classifier:")
print(f"Accuracy: {rf_accuracy:.4f}")
print(f"MSE: {rf_mse:.4f}")
print(f"R^2: {rf_r2:.4f}")

# Feature importance for Random Forest
rf_feature_importance = rf_clf.feature_importances_
print("Random Forest Feature Importances:")
for feature, importance in zip(X.columns, rf_feature_importance):
    print(f"{feature}: {importance:.4f}")

# Ensemble Method (Voting Classifier)
voting_clf = VotingClassifier(estimators=[
    ('log_reg', log_reg),
    ('gb_clf', gb_clf),
    ('rf_clf', rf_clf)],
    voting='soft')
voting_clf.fit(X_train, y_train)
y_pred_voting = voting_clf.predict(X_test)

voting_accuracy = accuracy_score(y_test, y_pred_voting)
voting_mse = mean_squared_error(y_test, y_pred_voting)
voting_r2 = r2_score(y_test, y_pred_voting)

print("Ensemble Voting Classifier:")
print(f"Accuracy: {voting_accuracy:.4f}")
print(f"MSE: {voting_mse:.4f}")
print(f"R^2: {voting_r2:.4f}")
```

```
Logistic Regression:
Accuracy: 0.4615
MSE: 0.5385
R^2: -1.1667
Optimization terminated successfully.
```

```
         Current function value: 0.618116
         Iterations 6
                           Logit Regression Results

==============================================================================
========
Dep. Variable:           total_engage   No. Observations:
152
Model:                          Logit   Df Residuals:
148
Method:                           MLE   Df Model:
3
Date:                Tue, 28 May 2024   Pseudo R-squ.:
0.1081
Time:                        22:39:47   Log-Likelihood:
-93.954
converged:                       True   LL-Null:
-105.35
Covariance Type:            nonrobust   LLR p-value:
4.481e-05
==============================================================================
===============
                         coef    std err          z      P>|z|
[0.025      0.975]
------------------------------------------------------------------------------
---------------
const                -4.3246      1.165     -3.714      0.000      -
6.607      -2.042
semantic_seg_perc     0.5906      0.702      0.841      0.400      -
0.786       1.967
max_fine_recog       -0.3754      0.653     -0.575      0.565      -
1.656       0.905
similarity           24.4115      6.115      3.992      0.000
12.427      36.396
==============================================================================
===============
Gradient Boosting Classifier:
Accuracy: 0.7692
MSE: 0.2308
R^2: 0.0714
Gradient Boosting Feature Importances:
semantic_seg_perc: 0.1495
max_fine_recog: 0.2599
similarity: 0.5906
Random Forest Classifier:
Accuracy: 0.7179
MSE: 0.2821
R^2: -0.1349
Random Forest Feature Importances:
```

```
semantic_seg_perc: 0.2543
max_fine_recog: 0.3077
similarity: 0.4380
Ensemble Voting Classifier:
Accuracy: 0.7179
MSE: 0.2821
R^2: -0.1349

import pandas as pd
import numpy as np
from sklearn.model_selection import train_test_split
from sklearn.linear_model import LinearRegression, Ridge, Lasso,
ElasticNet
from sklearn.preprocessing import PolynomialFeatures
from sklearn.pipeline import make_pipeline
from sklearn.tree import DecisionTreeRegressor
from sklearn.ensemble import RandomForestRegressor
from sklearn.svm import SVR
from sklearn.metrics import mean_squared_error, r2_score,
accuracy_score, precision_score, recall_score, f1_score

# Models
models = [
    LinearRegression(),
    make_pipeline(PolynomialFeatures(degree=2), LinearRegression()),
    Ridge(alpha=1.0),
    Lasso(alpha=0.1),
    ElasticNet(alpha=0.1, l1_ratio=0.5),
    DecisionTreeRegressor(random_state=42),
    RandomForestRegressor(n_estimators=100, random_state=42),
    SVR(kernel='linear')
]

# Convert continuous target to discrete classes
def to_class(y):
    return np.round(y).astype(int)

# Train models and print evaluation metrics
for model in models:
    model.fit(X_train, y_train)
    y_pred = model.predict(X_test)

    print("Model:", type(model).__name__)
    print("R-squared:", r2_score(y_test, y_pred))
    print("Mean Squared Error:", mean_squared_error(y_test, y_pred))

    # Convert regression predictions to classification labels
    y_test_class = to_class(y_test)
    y_pred_class = to_class(y_pred)
```

```
    # Calculate classification metrics
    print("Classification Metrics:")
    try:
        print("Accuracy:", accuracy_score(y_test_class, y_pred_class))
        print("Precision:", precision_score(y_test_class,
y_pred_class, average='weighted'))
        print("Recall:", recall_score(y_test_class, y_pred_class,
average='weighted'))
        print("F1 Score:", f1_score(y_test_class, y_pred_class,
average='weighted'))
    except ValueError as e:
        print("Error in classification metrics calculation:", e)

    print("-------------------------------------")
```

```
Model: LinearRegression
R-squared: -0.5636086165782257
Mean Squared Error: 4127569.2130202493
Classification Metrics:
Accuracy: 0.0
Precision: 0.0
Recall: 0.0
F1 Score: 0.0
-------------------------------------
Model: Pipeline
R-squared: -0.5226562444031144
Mean Squared Error: 4019464.3146473775
Classification Metrics:
Accuracy: 0.0
Precision: 0.0
Recall: 0.0
F1 Score: 0.0
-------------------------------------
Model: Ridge
R-squared: -0.09334776187780669
Mean Squared Error: 2886188.086458179
Classification Metrics:
Accuracy: 0.0
Precision: 0.0
Recall: 0.0
F1 Score: 0.0
-------------------------------------
Model: Lasso
R-squared: -0.5629315621108244
Mean Squared Error: 4125781.9440415846
Classification Metrics:
Accuracy: 0.0
Precision: 0.0
Recall: 0.0
F1 Score: 0.0
```

```
--------------------------------------
Model: ElasticNet
R-squared: -0.052409088430919626
Mean Squared Error: 2778119.3495954676
Classification Metrics:
Accuracy: 0.0
Precision: 0.0
Recall: 0.0
F1 Score: 0.0
--------------------------------------
Model: DecisionTreeRegressor
R-squared: -1.6858925023407516
Mean Squared Error: 7090142.05
Classification Metrics:
Accuracy: 0.0
Precision: 0.0
Recall: 0.0
F1 Score: 0.0
--------------------------------------

C:\Users\Medhavi\anaconda3\Lib\site-packages\sklearn\metrics\
_classification.py:1344: UndefinedMetricWarning: Precision is ill-
defined and being set to 0.0 in labels with no predicted samples. Use
`zero_division` parameter to control this behavior.
  _warn_prf(average, modifier, msg_start, len(result))
C:\Users\Medhavi\anaconda3\Lib\site-packages\sklearn\metrics\
_classification.py:1344: UndefinedMetricWarning: Recall is ill-defined
and being set to 0.0 in labels with no true samples. Use
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`zero_division` parameter to control this behavior.
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```

```
C:\Users\Medhavi\anaconda3\Lib\site-packages\sklearn\metrics\
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C:\Users\Medhavi\anaconda3\Lib\site-packages\sklearn\metrics\
_classification.py:1344: UndefinedMetricWarning: Recall is ill-defined
and being set to 0.0 in labels with no true samples. Use
`zero_division` parameter to control this behavior.
  _warn_prf(average, modifier, msg_start, len(result))

Model: RandomForestRegressor
R-squared: -0.8091478750750432
Mean Squared Error: 4775736.710445
Classification Metrics:
Accuracy: 0.0
Precision: 0.0
Recall: 0.0
F1 Score: 0.0
--------------------------------------
Model: SVR
R-squared: -0.09927523923865134
Mean Squared Error: 2901835.271313836
Classification Metrics:
Accuracy: 0.0
Precision: 0.0
Recall: 0.0
F1 Score: 0.0
--------------------------------------
```

```
C:\Users\Medhavi\anaconda3\Lib\site-packages\sklearn\metrics\
_classification.py:1344: UndefinedMetricWarning: Precision is ill-
defined and being set to 0.0 in labels with no predicted samples. Use
`zero_division` parameter to control this behavior.
  _warn_prf(average, modifier, msg_start, len(result))
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_classification.py:1344: UndefinedMetricWarning: Recall is ill-defined
and being set to 0.0 in labels with no true samples. Use
`zero_division` parameter to control this behavior.
  _warn_prf(average, modifier, msg_start, len(result))
```

```python
import tensorflow as tf
from keras.preprocessing import image
from keras.applications.inception_v3 import InceptionV3,
preprocess_input, decode_predictions
import numpy as np

# Load the pre-trained InceptionV3 model
model = InceptionV3()

from keras.preprocessing import image
from keras.applications.vgg16 import VGG16, preprocess_input
from keras.models import Model
from scipy.spatial.distance import cosine
import numpy as np
import os

def load_and_preprocess_image(image_path):
    img = image.load_img(image_path, target_size=(224, 224))
    img_array = image.img_to_array(img)
    img_array = np.expand_dims(img_array, axis=0)
    img_array = preprocess_input(img_array)
    return img_array

def extract_features(model, image_path):
    img_array = load_and_preprocess_image(image_path)
    features = model.predict(img_array)
    return features.flatten()

def style_similarity(reference_image_path, dataset_path):
```

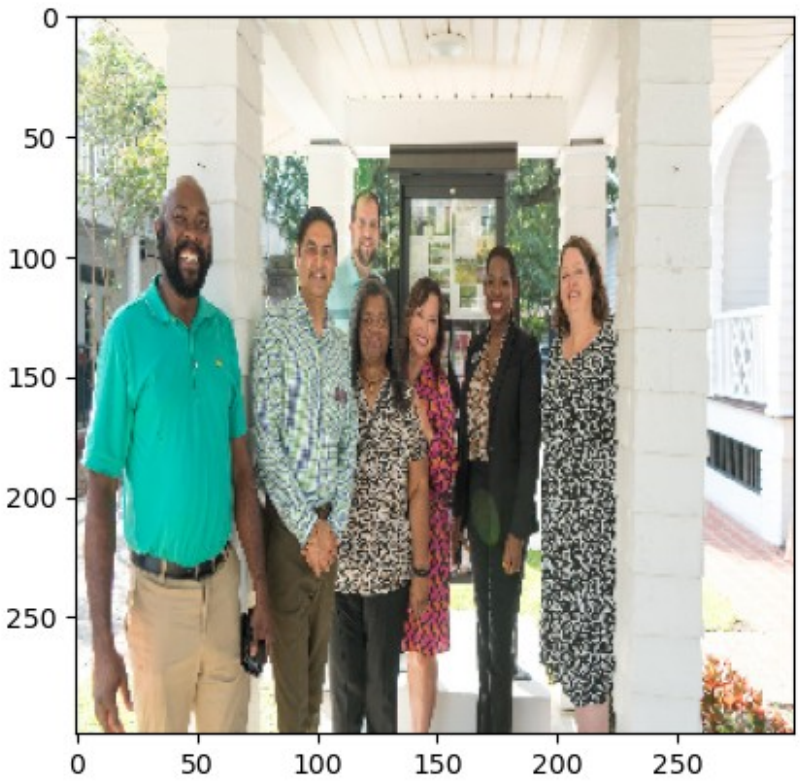
```
    # Load the VGG16 model pre-trained on ImageNet data
    base_model = VGG16(weights='imagenet')

    # Remove the classification head
    model = Model(inputs=base_model.input,
outputs=base_model.get_layer('block4_pool').output)

    # Extract features for the reference image
    reference_features = extract_features(model, reference_image_path)

    # Calculate similarity for each image in the dataset
    similarities = []
    for filename in os.listdir(dataset_path):
        if filename.endswith(".jpeg"): #or filename.endswith(".png")
or filename.endswith('jpg'):
            image_path = os.path.join(dataset_path, filename)
            image_features = extract_features(model, image_path)
            similarity = 1 - cosine(reference_features,
image_features)
            similarities.append((filename, similarity))

    return similarities

# Example usage
reference_image_path = "C:/Users/Medhavi/wm14.jpg"
dataset_path = "C:/Users/Medhavi"

similarities = style_similarity(reference_image_path, dataset_path)

# Print similarity scores for each image in the dataset
for filename, similarity in similarities:
    print(f"{filename}: {similarity}")
```

```
1/1 ━━━━━━━━━━━━━━━━━━━━ 1s 917ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 389ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 412ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 431ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 367ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 432ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 422ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 469ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 473ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 373ms/step
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 440ms/step
mi34.jpeg: 0.19434422254562378
mi36.jpeg: 0.16054114699363708
mi37.jpeg: 0.173394113779068
mi38.jpeg: 0.11014356464147568
mi39.jpeg: 0.18839794397354126
mi40.jpeg: 0.1393124759197235
```

```
mi49.jpeg: 0.1443760246038437
mi54.jpeg: 0.179082989692688
w2.jpeg: 0.1809348464012146
w3.jpeg: 0.22531314194202423
```

```python
import tensorflow as tf
import cv2
import numpy as np

# Load the pre-trained InceptionV3 model
model = tf.keras.applications.InceptionV3(weights='imagenet')

# Load and preprocess the image
image_path = 'bh26.jpg'
img = tf.keras.preprocessing.image.load_img(image_path,
target_size=(299, 299))
img_array = tf.keras.preprocessing.image.img_to_array(img)
img_array = np.expand_dims(img_array, axis=0)
img_array =
tf.keras.applications.inception_v3.preprocess_input(img_array)

# Get predictions
predictions = model.predict(img_array)

# Decode predictions
decode_predictions =
tf.keras.applications.inception_v3.decode_predictions(predictions)

# Print top predictions
for i, (imagenet_id, label, score) in
enumerate(decode_predictions[0]):
    print(f"{i + 1}: {label} ({score:.2f})")
# Optionally, you can display the image
import matplotlib.pyplot as plt
plt.imshow(img)
plt.show()
```

```
1/1 ━━━━━━━━━━━━━━━━━━━━ 7s 7s/step
1: cash_machine (0.28)
2: chain_mail (0.18)
3: turnstile (0.08)
4: abaya (0.05)
5: mosque (0.01)
```




```
import cv2
import numpy as np
from tensorflow.keras.models import load_model
from tensorflow.keras.applications.vgg16 import preprocess_input
from tensorflow.keras.preprocessing import image as keras_image

# Load pre-trained models
face_cascade_path = 'Downloads/haarcascade_frontalface_default.xml'
face_cascade = cv2.CascadeClassifier(face_cascade_path)
vgg_model = load_model('Downloadsvgg_face.py')  # Replace with your
pre-trained face recognition model

# Load and preprocess input image
img_path = 'input_image.jpg'
img = cv2.imread(img_path)
gray_img = cv2.cvtColor(img, cv2.COLOR_BGR2GRAY)

# Perform face detection
faces = face_cascade.detectMultiScale(gray_img, scaleFactor=1.1,
minNeighbors=5, minSize=(30, 30))

# Perform face recognition
for (x, y, w, h) in faces:
    # Extract face region
    face_roi = gray_img[y:y+h, x:x+w]
```

```
    # Preprocess face image for the CNN model
    face_img = cv2.resize(face_roi, (224, 224))  # Assuming input size
of VGG16 model
    face_img = keras_image.img_to_array(face_img)
    face_img = np.expand_dims(face_img, axis=0)
    face_img = preprocess_input(face_img)

    # Perform face recognition using pre-trained CNN model
    predicted_embedding = vgg_model.predict(face_img)

    # Perform further processing with the predicted embedding, such as
matching against a database of known faces

    # Draw rectangle around the face
    cv2.rectangle(img, (x, y), (x+w, y+h), (255, 0, 0), 2)

# Display the result
cv2.imshow('Face Recognition', img)
cv2.waitKey(0)
cv2.destroyAllWindows()
```

```
---------------------------------------------------------------------------
-----
UnimplementedError                        Traceback (most recent call
last)
Cell In[11], line 10
      8 face_cascade_path =
'Downloads/haarcascade_frontalface_default.xml'
      9 face_cascade = cv2.CascadeClassifier(face_cascade_path)
---> 10 vgg_model = load_model('https://github.com/rcmalli/keras-
vggface.git')  # Replace with your pre-trained face recognition model
     12 # Load and preprocess input image
     13 img_path = 'input_image.jpg'

File ~\anaconda3\Lib\site-packages\keras\src\saving\saving_api.py:217,
in load_model(filepath, custom_objects, compile, safe_mode, **kwargs)
    212 local_path = os.path.join(
    213     saving_lib.get_temp_dir(), os.path.basename(filepath)
    214 )
    216 # Copy from remote to temporary local directory
--> 217 tf.io.gfile.copy(filepath, local_path, overwrite=True)
    219 # Switch filepath to local zipfile for loading model
    220 if zipfile.is_zipfile(local_path):

File ~\anaconda3\Lib\site-packages\tensorflow\python\lib\io\
file_io.py:581, in copy_v2(src, dst, overwrite)
    516 @tf_export("io.gfile.copy")
    517 def copy_v2(src, dst, overwrite=False):
    518   """Copies data from `src` to `dst`.
```

```
    519
    520   >>> with open("/tmp/x", "w") as f:
   (...)
    579     errors.OpError: If the operation fails.
    580   """
--> 581   _pywrap_file_io.CopyFile(
    582       compat.path_to_bytes(src), compat.path_to_bytes(dst),
overwrite)

UnimplementedError: File system scheme 'https' not implemented (file:
'https://github.com/rcmalli/keras-vggface.git')
```

```python
import numpy as np
import cv2
from keras.models import load_model
from keras.preprocessing import image
from keras_vggface.vggface import VGGFace
from keras_vggface.utils import preprocess_input

# Load the pre-trained VGGFace model
vggface = VGGFace(model='vgg16', weights='vggface', input_shape=(224,
224, 3))

# Load an image for emotion detection
img_path = 'Pictures/amazon4.jpg'
img = image.load_img(img_path, target_size=(224, 224))
img = image.img_to_array(img)
img = np.expand_dims(img, axis=0)
img = preprocess_input(img)

# Make predictions using VGGFace
emotion_labels = ['Angry', 'Disgust', 'Fear', 'Happy', 'Sad',
'Surprise', 'Neutral']
emotion_model = load_model('path_to_emotion_model.h5')  # Replace with
your emotion detection model
emotion_predictions = emotion_model.predict(img)

# Get the emotion label
predicted_emotion = emotion_labels[np.argmax(emotion_predictions)]

# Display the predicted emotion
print(f'Predicted Emotion: {predicted_emotion}')
```

```
---------------------------------------------------------------------
-----
ModuleNotFoundError                       Traceback (most recent call
last)
Cell In[7], line 5
      3 from keras.models import load_model
      4 from keras.preprocessing import image
```

```
----> 5 from keras_vggface.vggface import VGGFace
      6 from keras_vggface.utils import preprocess_input
      8 # Load the pre-trained VGGFace model

ModuleNotFoundError: No module named 'keras_vggface'
```

```
import cv2

def get_image_resolution(image_path):
    # Read the image using OpenCV
    img = cv2.imread(image_path)

    if img is not None:
        # Get image width and height
        height, width, _ = img.shape
        resolution = (width, height)
        return resolution
    else:
        print("Error: Could not read the image.")
        return None

# Example usage
image_path = 'Pictures/amazon5.jpg'
resolution = get_image_resolution(image_path)

if resolution:
    print(f"Image Resolution: {resolution[0]} x {resolution[1]}
pixels")
```

```
Image Resolution: 843 x 843 pixels
```

```
import cv2
import numpy as np

# Load YOLOv3 model
net = cv2.dnn.readNet("yolos.weights", "yolos.cfg")
classes = []
with open("coco.names", "r") as f:
    classes = [line.strip() for line in f.readlines()]

# Load image
image = cv2.imread("amazon1.jpg")  # Replace with the path to your
image
height, width, _ = image.shape

# Prepare image for YOLOv3
blob = cv2.dnn.blobFromImage(image, 0.00392, (416, 416), (0, 0, 0),
True, crop=False)
net.setInput(blob)
outs = net.forward(net.getUnconnectedOutLayersNames())
```

```
# Process the results
conf_threshold = 0.5
nms_threshold = 0.4

class_ids = []
confidences = []
boxes = []

for out in outs:
    for detection in out:
        scores = detection[5:]
        class_id = np.argmax(scores)
        confidence = scores[class_id]
        if confidence > conf_threshold:
            center_x = int(detection[0] * width)
            center_y = int(detection[1] * height)
            w = int(detection[2] * width)
            h = int(detection[3] * height)

            x = int(center_x - w / 2)
            y = int(center_y - h / 2)

            class_ids.append(class_id)
            confidences.append(float(confidence))
            boxes.append([x, y, w, h])

# Apply non-maximum suppression to remove overlapping boxes
indices = cv2.dnn.NMSBoxes(boxes, confidences, conf_threshold,
nms_threshold)

# Draw bounding boxes on the image
for i in indices:
    i = i[0]
    box = boxes[i]
    x, y, w, h = box
    label = str(classes[class_ids[i]])
    confidence = confidences[i]
    color = (0, 255, 0)  # Green
    cv2.rectangle(image, (x, y), (x + w, y + h), color, 2)
    cv2.putText(image, f"{label} {confidence:.2f}", (x, y - 10),
cv2.FONT_HERSHEY_SIMPLEX, 0.5, color, 2)

# Display the resulting image
cv2.imshow("Object Detection", image)
cv2.waitKey(0)
cv2.destroyAllWindows()

import tensorflow as tf
from tensorflow.keras.preprocessing import image
import numpy as np
```

```
# Load your pre-trained emotion detection model
model = tf.keras.models.load_model('emotion_detection_model.h5')

# Load and preprocess your image
img_path = 'Pictures/p2wmart.jpg'
img = image.load_img(img_path, target_size=(48, 48), grayscale=True)
# Adjust target size and color as needed
x = image.img_to_array(img)
x = np.expand_dims(x, axis=0)
x = x / 255.0  # Normalize pixel values if required

# Make predictions
emotion_labels = ['Angry', 'Disgust', 'Fear', 'Happy', 'Sad',
'Surprise', 'Neutral']
predictions = model.predict(x)
predicted_emotion = emotion_labels[np.argmax(predictions)]

# Display the predicted sentiment
print(f'Predicted Emotion/Sentiment: {predicted_emotion}')

import torch
from torchvision import models, transforms
from PIL import Image

# Load a pre-trained AlexNet model
model = models.alexnet(pretrained=True)
model.eval()

# Preprocess and load an image
img_path = 'path_to_image.jpg'
transform = transforms.Compose([
    transforms.Resize(256),
    transforms.CenterCrop(224),
    transforms.ToTensor(),
    transforms.Normalize(mean=[0.485, 0.456, 0.406], std=[0.229,
0.224, 0.225]),
])
img = Image.open(img_path)
img = transform(img).unsqueeze(0)

# Make predictions
with torch.no_grad():
    outputs = model(img)

_, predicted_class = outputs.max(1)
print(f"Predicted class: {predicted_class.item()}")

import tensorflow as tf
from tensorflow.keras.applications import VGG16
```

```
from tensorflow.keras.applications.vgg16 import preprocess_input,
decode_predictions
from tensorflow.keras.preprocessing import image

# Load the pre-trained VGG16 model
model = VGG16(weights='imagenet')

# Load and preprocess an image
img_path = 'path_to_image.jpg'
img = image.load_img(img_path, target_size=(224, 224))
x = image.img_to_array(img)
x = preprocess_input(x)
x = tf.expand_dims(x, axis=0)

# Make predictions
predictions = model.predict(x)

# Decode and print the top predictions
decoded_predictions = decode_predictions(predictions, top=5)[0]
for i, (imagenet_id, label, score) in enumerate(decoded_predictions):
    print(f"{i + 1}: {label} ({score:.2f})")
```

```
import tensorflow as tf
from tensorflow.keras.applications import MobileNetV2
from tensorflow.keras.applications.mobilenet_v2 import
preprocess_input, decode_predictions
from tensorflow.keras.preprocessing import image

# Load the pre-trained MobileNetV2 model
model = MobileNetV2(weights='imagenet')

# Load and preprocess an image
img_path = 'path_to_image.jpg'
img = image.load_img(img_path, target_size=(224, 224))
x = image.img_to_array(img)
x = preprocess_input(x)
x = tf.expand_dims(x, axis=0)

# Make predictions
predictions = model.predict(x)

# Decode and print the top predictions
decoded_predictions = decode_predictions(predictions, top=5)[0]
for i, (imagenet_id, label, score) in enumerate(decoded_predictions):
    print(f"{i + 1}: {label} ({score:.2f})")
```

```
import tensorflow as tf
import numpy as np
from PIL import Image
from matplotlib import pyplot as plt
```

```
from deeplab import DeepLabModel

# Load DeepLabV3 model
MODEL = DeepLabModel("deeplabv3_pascal_trainval_2018_01_04.tar.gz")

# Load and preprocess the image
image_path = "C:/Users/HP/p2wmart.jpg"
image = Image.open(image_path)
resized_image = image.resize((513, 513), Image.ANTIALIAS)
input_tensor = tf.convert_to_tensor(np.array(resized_image))

# Perform semantic segmentation
output_tensor = MODEL.run(input_tensor)
segmentation_map = np.argmax(output_tensor, axis=-1)[0]

# Display the segmentation map
plt.imshow(segmentation_map)
plt.show()

import torch
import torchvision
from PIL import Image
from torchvision import transforms

model = torchvision.models.detection.captioning(pretrained=True)
model.eval()

image = Image.open("path_to_your_image.jpg")
preprocess = transforms.Compose([
    transforms.Resize((224, 224)),
    transforms.ToTensor(),
    transforms.Normalize(mean=[0.485, 0.456, 0.406], std=[0.229,
0.224, 0.225]),
])
input_tensor = preprocess(image)
input_batch = input_tensor.unsqueeze(0)

with torch.no_grad():
    output = model(input_batch)
caption = output[0]["caption"]

import torch
import torchvision
from PIL import Image
from torchvision import transforms

model =
torchvision.models.segmentation.deeplabv3_resnet50(pretrained=True)
model.eval()

image = Image.open("path_to_your_image.jpg")
```

```
preprocess = transforms.Compose([
    transforms.Resize((512, 512)),
    transforms.ToTensor(),
    transforms.Normalize(mean=[0.485, 0.456, 0.406], std=[0.229,
0.224, 0.225]),
])
input_tensor = preprocess(image)
input_batch = input_tensor.unsqueeze(0)

with torch.no_grad():
    output = model(input_batch)["out"][0]
output_predictions = output.argmax(0)

# Process the output_predictions to get the semantic segmentation
result

import cv2
import torch
from torchvision import models, transforms

# Load a pre-trained image classification model (e.g., ResNet)
model = models.resnet50(pretrained=True)
model.eval()

# Preprocessing transforms for the image
preprocess = transforms.Compose([
    transforms.Resize(256),
    transforms.CenterCrop(224),
    transforms.ToTensor(),
    transforms.Normalize(mean=[0.485, 0.456, 0.406], std=[0.229,
0.224, 0.225])
])

# Load and preprocess the image
image_path = 'Pictures/amazon1.jpg'
image = cv2.imread(image_path)
image = cv2.cvtColor(image, cv2.COLOR_BGR2RGB)
input_tensor = preprocess(image)
input_batch = input_tensor.unsqueeze(0)

# Make predictions on the image
with torch.no_grad():
    output = model(input_batch)

# Get the predicted class
_, predicted_idx = torch.max(output, 1)
predicted_class = predicted_idx.item()

# Display the predicted class label (you can map it to like count
based on your own analysis)
```

```
print(f"Predicted class: {predicted_class}")

# Further analysis and decision-making based on the predicted class
label
# You can map the class label to like count or perform additional
analysis
```

```
---------------------------------------------------------------------------
-----
ModuleNotFoundError                       Traceback (most recent call
last)
Cell In[3], line 1
----> 1 import cv2
      2 import torch
      3 from torchvision import models, transforms

ModuleNotFoundError: No module named 'cv2'
```