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KODE1.py - C:\Users\Hp\OneDrive\Documents\OPENCV\KODE1.py (3.11.9)
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import cv2
import numpy as np
cap = cv2.VideoCapture(0)

while True:
    ret, frame = cap.read()
    frame = cv2.flip(frame, 1)
    cv2.imshow("camera", frame)
    key = cv2.waitKey(1)
    if key == 27:
        break

cap.release()
cv2.destroyAllWindows()

KODE2.py - C:\Users\Hp\OneDrive\Documents\OPENCV\KODE2.py (3.11.9)
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import cv2
import numpy as np
import csv

# Konfigurasi Kamera
cap = cv2.VideoCapture(0)
cap.set(cv2.CAP_PROP_FRAME_WIDTH, 480)
cap.set(cv2.CAP_PROP_FRAME_HEIGHT, 360)

# Nama file database
FileDB = 'DatabaseWarna.txt'

# Header untuk file CSV
header = ['B', 'G', 'R', 'Target']

# Buat file CSV jika belum ada
try:
    with open(FileDB, 'x', newline='') as f:
        writer = csv.writer(f)
        writer.writerow(header)
except FileExistsError:
    print(f'{FileDB} sudah ada, melanjutkan penambahan data.')

print("Tekan tombol berikut untuk menambahkan data warna:")
print("1: Merah, 2: Hijau, 3: Biru, 4: Hitam, 5: Kuning, 6: Putih, ESC: Keluar")

while True:
    ret, img = cap.read()
    if not ret:
        print("Gagal membaca frame dari kamera.")
        break

    img = cv2.flip(img, 1) # Membalikkan kamera jika terbalik

    # Ambil warna rata-rata dari area tertentu
    region = img[220:260, 300:340] # Area yang dianalisis
    colorB = int(np.mean(region[:, :, 0]))
    colorG = int(np.mean(region[:, :, 1]))
    colorR = int(np.mean(region[:, :, 2]))
    color = [colorB, colorG, colorR]

    # Tampilkan area analisis dan warna rata-rata
    cv2.rectangle(img, (330, 220), (340, 260), (0, 255, 0), 2)
    cv2.putText(img, f"B: {colorB}, G: {colorG}, R: {colorR}", (10, 30),
                cv2.FONT_HERSHEY_SIMPLEX, 1, (255, 255, 255), 2)
    cv2.imshow("Database Color Capture", img)

    # Deteksi tombol untuk menentukan warna
    key = cv2.waitKey(30) & 0xff
    if key == ord('1'): # Merah
        label = 'merah'
    elif key == ord('2'): # Hijau
        label = 'hijau'
    elif key == ord('3'): # Biru
        label = 'biru'
    elif key == ord('4'): # Hitam
        label = 'hitam'
    elif key == ord('5'): # Kuning
        label = 'kuning'
    elif key == ord('6'): # Putih
        label = 'putih'
    elif key == 27: # ESC untuk keluar
        break
    else:
        continue

    # Simpan data ke file CSV
    with open(FileDB, 'a', newline='') as f:
        writer = csv.writer(f)
        writer.writerow(color + [label])
    print(f'Data {color} dengan label '{label}' telah disimpan.')

cap.release()
cv2.destroyAllWindows()
```

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KODE3.py - C:\Users\Hp\OneDrive\Documents\OPENCV\KODE3.py (3.11.9)
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import cv2
import numpy as np
import csv
import time
from sklearn import svm
import pandas as pd
from sklearn.preprocessing import StandardScaler

# Konfigurasi Kamera
cap = cv2.VideoCapture(0)
cap.set(cv2.CAP_PROP_FRAME_WIDTH, 480)
cap.set(cv2.CAP_PROP_FRAME_HEIGHT, 360)

# Membaca Database
FileDB = 'DatabaseWarna.txt' # Pastikan file ini tersedia dan formatnya benar
Database = pd.read_csv(FileDB, sep=";", header=0)
print("Database:\n", Database)

# X = Data (B, G, R), y = Target
X = Database[['B', 'G', 'R']]
y = Database['Target']

# Normalisasi Data dan Pelatihan Model SVM
scaler = StandardScaler()
X_scaled = scaler.fit_transform(X)
clf = svm.SVC(kernel='linear') # Gunakan kernel linear
clf.fit(X_scaled, y)

# Fungsi Prediksi Warna
def predict_color(b, g, r):
    color_scaled = scaler.transform([[b, g, r]])
    try:
        prediction = clf.predict(color_scaled)[0] # Ambil hasil prediksi
    except Exception as e:
        return "Tidak Teridentifikasi"

# Loop Kamera untuk Prediksi
while True:
    ret, img = cap.read()
    if not ret:
        print("Gagal membaca frame dari kamera.")
        break

    img = cv2.flip(img, 1) # Membalikkan kamera jika terbalik

    # Ambil warna rata-rata dari area tertentu
    region = img[220:260, 300:340] # Area yang dianalisis
    colorB = int(np.mean(region[:, :, 0]))
    colorG = int(np.mean(region[:, :, 1]))
    colorR = int(np.mean(region[:, :, 2]))
    color = [colorB, colorG, colorR]

    # Prediksi warna
    prediction = predict_color(colorB, colorG, colorR)
    print(f"B: {colorB}, G: {colorG}, R: {colorR} => Prediksi: {prediction}")

    # Tampilkan hasil di jendela kamera
    cv2.putText(img, f"Prediksi: {prediction}", (10, 30), cv2.FONT_HERSHEY_SIMPLEX,
        1, (255, 255, 255), 2)
    cv2.rectangle(img, (330, 220), (340, 260), (0, 255, 0), 2) # Area analisis
    cv2.imshow("Color Tracking", img)

    # Tombol keluar (ESC)
    key = cv2.waitKey(30) & 0xFF
    if key == 27: # Tekan ESC untuk keluar
        break

cap.release()
cv2.destroyAllWindows()

IDLE Shell 3.11.9*
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Warning (from warnings module):
  File "C:\Users\Hp\AppData\Local\Programs\Python\Python311\Lib\site-packages\sk
learn\utils\validation.py", line 2739
    warnings.warn(
UserWarning: X does not have valid feature names, but StandardScaler was fitted
with feature names
B: 7, G: 11, R: 8 => Prediksi: hitam

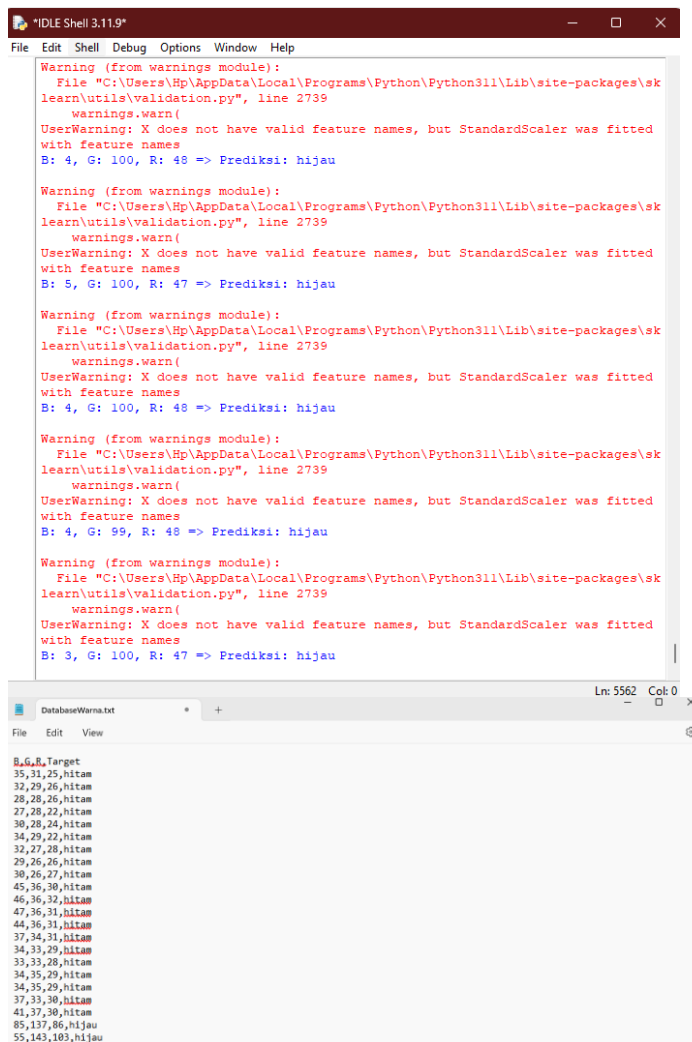
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UserWarning: X does not have valid feature names, but StandardScaler was fitted
with feature names
B: 6, G: 11, R: 8 => Prediksi: hitam

Warning (from warnings module):
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    warnings.warn(
UserWarning: X does not have valid feature names, but StandardScaler was fitted
with feature names
B: 6, G: 11, R: 8 => Prediksi: hitam

Warning (from warnings module):
  File "C:\Users\Hp\AppData\Local\Programs\Python\Python311\Lib\site-packages\sk
learn\utils\validation.py", line 2739
    warnings.warn(
UserWarning: X does not have valid feature names, but StandardScaler was fitted
with feature names
B: 7, G: 11, R: 8 => Prediksi: hitam

Warning (from warnings module):
  File "C:\Users\Hp\AppData\Local\Programs\Python\Python311\Lib\site-packages\sk
learn\utils\validation.py", line 2739
    warnings.warn(
UserWarning: X does not have valid feature names, but StandardScaler was fitted
with feature names
B: 8, G: 10, R: 11 => Prediksi: hitam

Ln: 3174 Col: 0
```



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Warning (from warnings module):
  File "C:\Users\Hp\AppData\Local\Programs\Python\Python311\Lib\site-packages\sk
learn\utils\validation.py", line 2739
    warnings.warn(
UserWarning: X does not have valid feature names, but StandardScaler was fitted
with feature names
B: 4, G: 100, R: 48 => Prediksi: hijau

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  File "C:\Users\Hp\AppData\Local\Programs\Python\Python311\Lib\site-packages\sk
learn\utils\validation.py", line 2739
    warnings.warn(
UserWarning: X does not have valid feature names, but StandardScaler was fitted
with feature names
B: 5, G: 100, R: 47 => Prediksi: hijau

Warning (from warnings module):
  File "C:\Users\Hp\AppData\Local\Programs\Python\Python311\Lib\site-packages\sk
learn\utils\validation.py", line 2739
    warnings.warn(
UserWarning: X does not have valid feature names, but StandardScaler was fitted
with feature names
B: 4, G: 100, R: 48 => Prediksi: hijau

Warning (from warnings module):
  File "C:\Users\Hp\AppData\Local\Programs\Python\Python311\Lib\site-packages\sk
learn\utils\validation.py", line 2739
    warnings.warn(
UserWarning: X does not have valid feature names, but StandardScaler was fitted
with feature names
B: 4, G: 99, R: 48 => Prediksi: hijau

Warning (from warnings module):
  File "C:\Users\Hp\AppData\Local\Programs\Python\Python311\Lib\site-packages\sk
learn\utils\validation.py", line 2739
    warnings.warn(
UserWarning: X does not have valid feature names, but StandardScaler was fitted
with feature names
B: 3, G: 100, R: 47 => Prediksi: hijau
```

Ln: 5562 Col: 0

```
File Edit View
B,G,R,Target
35,31,25,hitam
32,29,26,hitam
28,28,26,hitam
27,28,22,hitam
30,28,24,hitam
34,29,22,hitam
32,27,28,hitam
29,26,26,hitam
30,26,27,hitam
45,36,30,hitam
46,36,32,hitam
47,36,31,hitam
44,36,31,hitam
37,34,31,hitam
34,33,29,hitam
33,33,28,hitam
34,35,29,hitam
34,35,29,hitam
37,33,30,hitam
41,37,30,hitam
85,137,86,hijau
55,143,103,hijau
```

Kode program ini dibuat untuk mengenali warna secara otomatis menggunakan kamera. Kamera akan menangkap gambar secara langsung dan bagian tertentu dari gambar dianalisis nilai rata-rata warnanya dalam bentuk BGR. Warna diberi tanda seperti merah, hijau, biru, dan lainnya dengan menekan tombol 1, 2, 3, dan seterusnya. Data warna tersebut kemudian disimpan ke dalam sebuah file database. Data yang terkumpul digunakan untuk kode program *Support Vector Machine* (SVM) yang bertujuan untuk memahami hubungan antara nilai BGR dengan nama warna. Setelah model ini dijalankan program dapat memprediksi warna baru berdasarkan data BGR dari gambar yang diambil kamera. Saat dijalankan, program akan menampilkan hasil prediksi warna dan nilai BGR langsung di layar.