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LAPORAN UAS MACHINE LEARNING

1. Membuat dan mengoptimasi parameter algoritma K-Nearest Neighbor (KNN)

```
import pandas as pd
import numpy as np

from sklearn.neighbors import KNeighborsClassifier
from sklearn.metrics import accuracy_score

from sklearn.model_selection import GridSearchCV
```

```
df = pd.read_csv('./diabetes_latih.csv')

X_train = df.values
X_train = np.delete(X_train,8,axis=1)

y_train = df['Outcome'].values

df = pd.read_csv('./diabetes_uji.csv')

X_test = df.values
X_test = np.delete(X_test,8,axis=1)

y_test = df['Outcome'].values
```

Maka akan muncul, dataset seperti dibawah ini.

```
df.head()
```

	Pregnancies	Glucose	BloodPressure	SkinThickness	Insulin	BMI	DiabetesPedigreeFunction	Age	Outcome
0	6	148	72	35	0	33.6	0.627	50	1
1	1	85	66	29	0	26.6	0.351	31	0
2	8	183	64	0	0	23.3	0.672	32	1
3	1	89	66	23	94	28.1	0.167	21	0
4	0	137	40	35	168	43.1	2.288	33	1

Lalu, mencoba prediksi tanpa tuning dan mendapatkan akurasi sebesar 0,682.

```
#KNN TANPA TUNING

knn_clf = KNeighborsClassifier(n_neighbors=3)
knn_clf.fit(X_train, y_train)

y_pred = knn_clf.predict(X_test)

round(accuracy_score(y_test, y_pred),3)
```

```
0.682
```

Karena belum optimal, maka kita mencari tuning yang mendapatkan nilai akurasi paling maksimal dan akhirnya didapatkan tuning 9 dengan akurasi sebesar 0.74.

```
param_grid = {'n_neighbors': np.arange(1,201)}

knn_clf = GridSearchCV(KNeighborsClassifier(), param_grid, cv=3, scoring='accuracy')

knn_clf.fit(X_train, y_train)
knn_clf.best_params_
```

```
{'n_neighbors': 9}
```

```
#KNN DENGAN TUNING TETANGGA TERDEKAT

knn_clf = KNeighborsClassifier(n_neighbors=9)
knn_clf.fit(X_train, y_train)

y_pred = knn_clf.predict(X_test)

round(accuracy_score(y_test, y_pred),3)
```

```
0.74
```

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Setelah itu, model machine learning disimpan dengan menggunakan pickle dan setelah dicoba, mendapatkan hasil akurasi yang sama yaitu 0,74. Model disimpan dengan nama knn_pickle. File ini nantinya akan digunakan dalam membuat aplikasi machine learning.

```
#PICKLE

import pickle
with open('knn_pickle', 'wb') as r:
  pickle.dump(knn_clf,r)
```

```
with open('knn_pickle','rb') as r:
  knnp = pickle.load(r)
```

```
y_pred = knnp.predict(X_test)

round(accuracy_score(y_test, y_pred),3)
```

```
0.74
```

2. Pada aplikasi berbasis web, berikut merupakan koding-koding yang ada.

- App.py

```
from flask import Flask, render_template, request, redirect
import pickle
import sklearn
import numpy as np
#numpy==1.19.3

app = Flask(__name__)

@app.route('/', methods=['POST', 'GET'])
def index():
    if request.method == 'POST':

        with open('knn_pickle', 'rb') as r:
            model = pickle.load(r)

        melahirkan = float(request.form['melahirkan'])
        glukosa = float(request.form['glukosa'])
        darah = float(request.form['darah'])
        kulit = float(request.form['kulit'])
        insulin = float(request.form['insulin'])
        bmi = float(request.form['bmi'])
        riwayat = float(request.form['riwayat'])
        umur = float(request.form['umur'])

        datas = np.array((melahirkan,glukosa,darah,kulit,insulin,bmi,riwayat,umur))
        datas = np.reshape(datas, (1, -1))

        isDiabetes = model.predict(datas)

        return render_template('hasil.html', finalData=isDiabetes)
    else:
        return render_template('index.html')

if __name__ == "__main__":
    app.run(debug=True)
```

- Base.html

```
<!DOCTYPE html>
<html lang="en">

<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <link rel="icon" type="image/png" href="{{ url_for('static', filename='css/images/icons/favicon.ico') }}"/>
    <link rel="stylesheet" type="text/css" href="{{ url_for('static', filename='css/vendor/bootstrap/css/bootstrap.min.css') }}">
    <link rel="stylesheet" type="text/css" href="{{ url_for('static', filename='css/fonts/font-awesome-4.7.0/css/font-awesome.min.css') }}" >
    <link rel="stylesheet" type="text/css" href="{{ url_for('static', filename='css/css/main.css') }}">

    {% block head %}{% endblock %}
</head>

<body>
    {% block body %}{% endblock %}
</body>

</html>
```

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- Index.html

```
{% extends 'base.html' %}

{% block head %}
<title>UAS MACHINE LEARNING</title>
{% endblock %}

{% block body %}
<div class="container-contact100">
    <div class="wrap-contact100">
        <form class="contact100-form validate-form" action="/" method="POST">
            <span class="contact100-form-title">
                Deteksi Diabetes
            </span>

            <div class="wrap-input100 validate-input">
                <span class="label-input100">Banyak Melahirkan</span>
                <input class="input100" type="text" placeholder="Masukan jumlah melahirkan" name="melahirkan" id="melahirkan" required>
                <span class="focus-input100"></span>
            </div>

            <div class="wrap-input100 validate-input" >
                <span class="label-input100">Kadar Glukosa</span>
                <input class="input100" type="text" placeholder="Masukan kadar glukosa" name="glukosa" id="glukosa" required>
                <span class="focus-input100"></span>
            </div>

            <div class="wrap-input100 validate-input" >
                <span class="label-input100">Tekanan Darah</span>
                <input class="input100" type="text" placeholder="Masukan tekanan darah" name="darah" id="darah" required>
                <span class="focus-input100"></span>
            </div>

            <div class="wrap-input100 validate-input" >
                <span class="label-input100">Tebal Kulit</span>
                <input class="input100" type="text" placeholder="Masukan ketebalan kulit" name="kulit" id="kulit" required>
                <span class="focus-input100"></span>
            </div>
```

```
            <div class="wrap-input100 validate-input" >
                <span class="label-input100">Kadar Insulin</span>
                <input class="input100" type="text" placeholder="Masukan kadar insulin" name="insulin" id="insulin" required>
                <span class="focus-input100"></span>
            </div>

            <div class="wrap-input100 validate-input" >
                <span class="label-input100">BMI</span>
                <input class="input100" type="text" placeholder="Masukan BMI" name="bmi" id="bmi" required>
                <span class="focus-input100"></span>
            </div>

            <div class="wrap-input100 validate-input" >
                <span class="label-input100">Riwayat Diabetes</span>
                <input class="input100" type="text" placeholder="Masukan derajat diabetes keturunan" name="riwayat" id="riwayat" required>
                <span class="focus-input100"></span>
            </div>

            <div class="wrap-input100 validate-input">
                <span class="label-input100">Umur</span>
                <input class="input100" type="text" placeholder="Masukan umur" name="umur" id="umur" required>
                <span class="focus-input100"></span>
            </div>

            <div class="container-contact100-form-btn">
                <div class="wrap-contact100-form-btn">
                    <div class="contact100-form-bgbtn"></div>
                    <button class="contact100-form-btn">
                        <span>
                            Prediksi
                            <i class="fa fa-long-arrow-right m-l-7" aria-hidden="true"></i>
                        </span>
                    </button>
                </div>
            </div>

        </form>
    </div>
```

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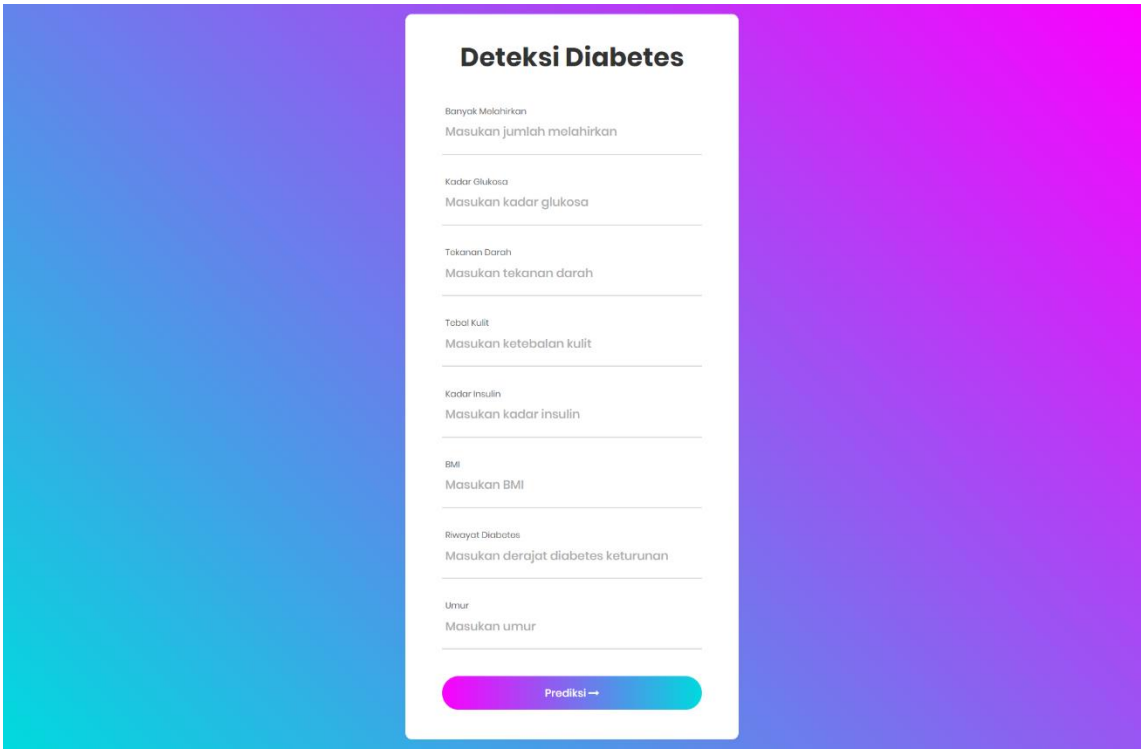
- Hasil.html

```
{% extends 'base.html' %}

{% block head %}
<title>UAS MACHINE LEARNING</title>
{% endblock %}

{% block body %}
<div class="container-contact100">
    <div class="wrap-contact100">
        <form class="contact100-form validate-form" action="/" method="GET">
            {% if finalData == 1 %}
            <span class="contact100-form-title">
                POSITIF DIABETES
            </span>

            {% else %}
            <span class="contact100-form-title">
                NEGATIF DIABETES
            </span>

            {% endif %}

            <div class="container-contact100-form-btn">
                <div class="wrap-contact100-form-btn">
                    <div class="contact100-form-bgbtn"></div>
                    <button class="contact100-form-btn">
                        <span>
                            Selesai
                        </span>
                    </button>
                </div>
            </div>

        </form>
    </div>
</div>

{% endblock %}
```

3. Hasil dari koding aplikasi tersebut adalah sebagai berikut

- Halaman awal



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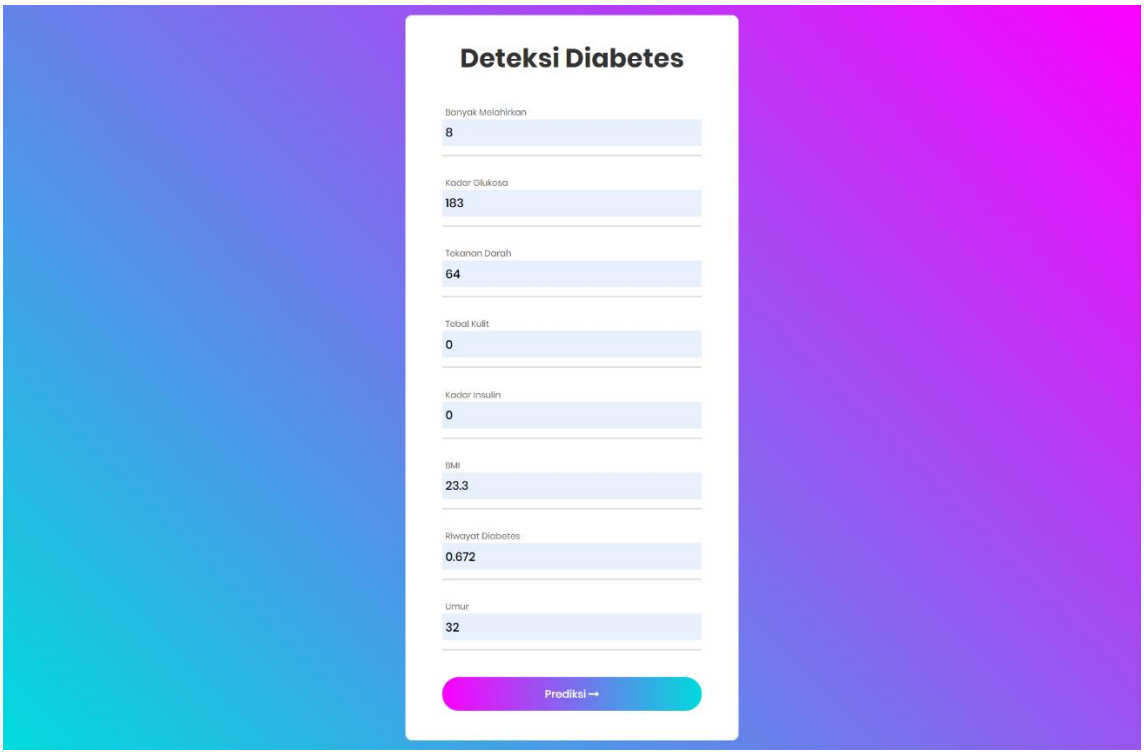
- Isi data



- Hasil sesuai dengan data yang dimasukan

atau