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UTS Machine Learning

WEB APLIKASI KLASIFIKASI JENIS BUNGA IRIS MENGGUNAKAN SINGLE LAYER PERCEPTRON (ANN).

Aplikasi dibuat menggunakan google collab, untuk melihat source code dan menjalankannya bisa langsung mengakses link berikut: https://colab.research.google.com/drive/1BGkvC7qnvZU8hd8YWcijVgjssLa7BuFX?usp=sharing

Penjelasan Source Code:

1. Instalasi library flask-ngrok untuk menjalankan framework flask didalam jaringan ngrok.

```
!pip install flask-ngrok
```

2. Import library pandas untuk digunakan dalam komputasi data science seperti mengolah data dll, library numpy digunakan untuk urusan numeric seperti memanipulasi tipe data dll.

```
import pandas as pd
import numpy as np
```

3. Class Single Layer Perceptron, berisi fungsi training data kemudian melakukan testing dari hasil training nya.

```python
class SingleLayerPerceptron:

  def learning(dataTest):
    # Import Dataset
    url = "https://raw.githubusercontent.com/atjhoendz/single-layer-perceptron/main/iris-data.xlsx"
    dataX = pd.read_excel(url, usecols=[0, 1, 2, 3])
    dataY = pd.read_excel(url, usecols=[5])
    x = np.array(dataX, np.float32)
    y = np.squeeze(np.array(dataY, np.float32))

    # Deklarasi nilai awal
    NUM_FEATURES = 4
    NUM_ITER = 100
    learning_rate = 0.1
    W = np.zeros(NUM_FEATURES, np.float32)
    b = np.zeros(1, np.float32)

    # Proses Learning
    for i in range(NUM_ITER):
      y_pred = np.dot(x, W) + b

      #activation sigmoid
      y_pred[y_pred > 0] = 1
      y_pred[y_pred <= 0] = 0

      err = y - y_pred

      if np.sum(err) == 0:
        break

      delta_W = learning_rate * np.dot(np.transpose(x), err)
      delta_b = learning_rate * np.sum(err)
      W = W + delta_W
      b = b + delta_b

      print ("Iterasi ke-" + str(i), err, W, b)

    # Proses Testing
    y_test = np.dot(dataTest, W) + b
    y_test = 1 if y_test > 0 else 0

    return y_test

```

4. Code untuk membuat halaman web menggunakan framework flask dengan merender file iris-prediction.html

```
[8]
from flask_ngrok import run_with_ngrok
from flask import Flask, render_template, request

app = Flask(__name__, template_folder='drive/My Drive/Colab Notebooks/')
run_with_ngrok(app)

@app.route("/")
def home():
  return render_template('iris-prediction.html')

@app.route("/submit", methods = ['POST'])
def submit():
  if request.method == 'POST':
    p_sepal = request.form['panjangSepal']
    l_sepal = request.form['lebarSepal']
    p_petal = request.form['panjangPetal']
    l_petal = request.form['lebarPetal']

    arr = [float(p_sepal), float(l_sepal), float(p_petal), float(l_petal)]

    SLP = SingleLayerPerceptron
    result = SLP.learning(arr)

    return render_template('iris-prediction.html', result=result, show=1, data=arr)

if __name__ == '__main__':
  app.run()
```

5. Code tampilan layout web

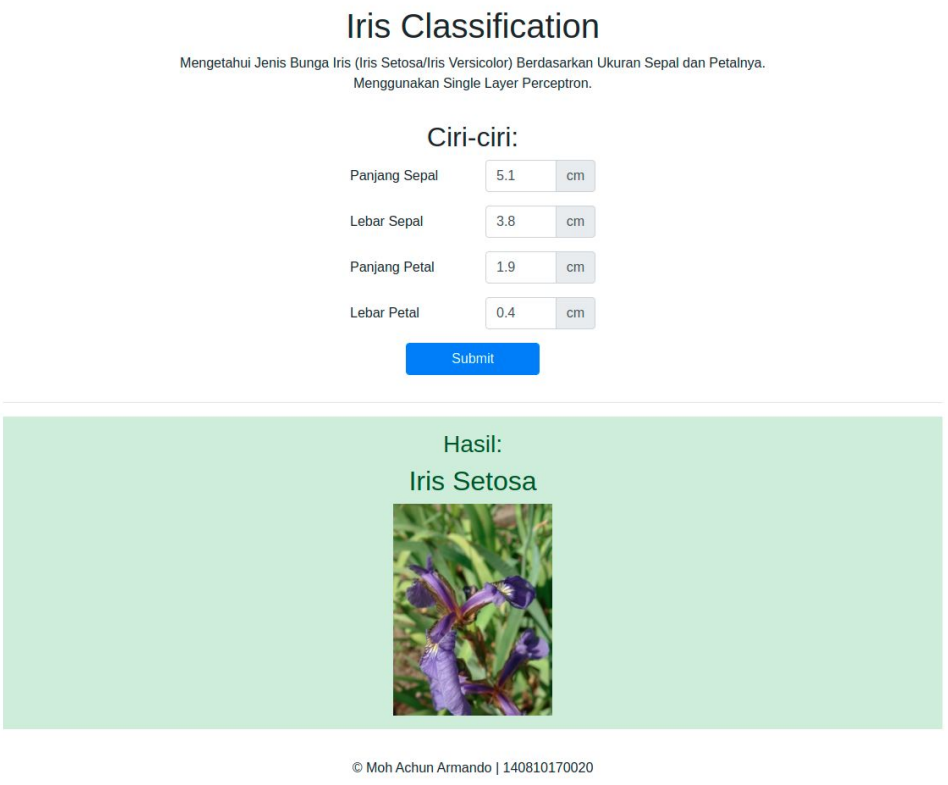
```html
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <meta name="viewport" content="width=device-width, initial-scale=1.0">
  <title>Iris Classification</title>
  <link rel="stylesheet" href="https://cdn.jsdelivr.net/npm/bootstrap@4.5.3/dist/css/bootstrap.min.css"
 integrity="sha384-TX8t27EcRE3e/ihU7zmQxVncDAy5uIKz4rEkgIXeMed4M0jlfIDPvg6uqKI2xXr2" crossorigin="
anonymous">
</head>
<body>
  <div class="container mt-5 align-items-center">
    <div class="row justify-content-center">
      <div class="text-center col-12">
        <h1>Iris Classification</h1>
        <p>
Mengetahui Jenis Bunga Iris (Iris Setosa/Iris Versicolor) Berdasarkan Ukuran Sepal dan Petalnya. <br>
 Menggunakan Single Layer Perceptron.</p>
      </div>
      <div class="mt-3" style="width: 450px">
        <h2 class="text-center">Ciri-ciri:</h2>
        <form action="/submit" method="post">
          <div class="form-group row">
            <label for="panjangSepal" class="col-4 col-form-label ml-auto">Panjang Sepal</label>
            <div class="col-4 mr-auto">
              <div class="input-group">
                <input type="number" class="form-control" name="panjangSepal" value="
{{ data[0] if data else 0 }}" step=0.1 required>
                <div class="input-group-append">
                  <div class="input-group-text">cm</div>
                </div>
              </div>
            </div>
          </div>
          <div class="form-group row">
            <label for="lebarSepal" class="col-4 col-form-label ml-auto">Lebar Sepal</label>
            <div class="col-4 mr-auto">
              <div class="input-group">
                <input type="number" class="form-control" name="lebarSepal" value="
{{ data[1] if data else 0 }}" step=0.1 required>
                <div class="input-group-append">
                  <div class="input-group-text">cm</div>
                </div>
              </div>
            </div>
          </div>
          <div class="form-group row">
            <label for="panjangPetal" class="col-4 col-form-label ml-auto">Panjang Petal</label>
            <div class="col-4 mr-auto">
              <div class="input-group">
                <input type="number" class="form-control" name="panjangPetal" value="
{{ data[2] if data else 0 }}" step=0.1 required>
                <div class="input-group-append">
                  <div class="input-group-text">cm</div>
                </div>
              </div>
            </div>
          </div>
          <div class="form-group row">
            <label for="lebarPetal" class="col-4 col-form-label ml-auto">Lebar Petal</label>
            <div class="col-4 mr-auto">
              <div class="input-group">
                <input type="number" class="form-control" name="lebarPetal" value="
{{ data[3] if data else 0 }}" step=0.1 required>
                <div class="input-group-append">
                  <div class="input-group-text">cm</div>
                </div>
              </div>
            </div>
          </div>
          <div class="form-group">
            <div class="col-5 mx-auto">
              <input type="submit" class="form-control btn-primary" value="Submit">
            </div>
          </div>
        </form>
      </div>
    </div>
    {% if result==1 and show %}
    <div id="result" class="mb-5">
      <hr>
      <div class="text-center alert-success p-3">
        <h3>Hasil:</h3>
        <h2>Iris Versicolor</h2>
        <img src="https://upload.wikimedia.org/wikipedia/commons/2/27/Blue_Flag,_Ottawa.jpg" alt="
iris-versicolor" height="250px">
      </div>
    </div>
    {% elif result==0 and show %}
    <div id="result" class="mb-5">
      <hr>
      <div class="text-center alert-success p-3">
        <h3>Hasil:</h3>
        <h2>Iris Setosa</h2>
        <img src="
https://upload.wikimedia.org/wikipedia/commons/5/56/Kosaciec_szczecinkowaty_Iris_setosa.jpg" alt="
iris-setosa" height="250px">
      </div>
    </div>
    {% endif %}
  </div>
  <footer class="text-center footer fixed-bottom mb-3">
    &copy Moh Achun Armando | 140810170020
  </footer>
</body>
</html>
```

Uji Coba dan Screenshot Tampilan

Data Testing

5.1	3.8	1.9	0.4	Iris-setosa	0
4.8	3	1.4	0.3	Iris-setosa	0
5.1	3.8	1.6	0.2	Iris-setosa	0
4.6	3.2	1.4	0.2	Iris-setosa	0
5.3	3.7	1.5	0.2	Iris-setosa	0
5	3.3	1.4	0.2	Iris-setosa	0
7	3.2	4.7	1.4	Iris-versicolor	1
6.4	3.2	4.5	1.5	Iris-versicolor	1
6.9	3.1	4.9	1.5	Iris-versicolor	1
5.5	2.3	4	1.3	Iris-versicolor	1
6.5	2.8	4.6	1.5	Iris-versicolor	1

- Uji coba data pertama (SESUAI)



- Uji coba data terakhir (SESUAI)