**KLASIFIKASI PENGGUNAAN LENSA KACAMATA DENGAN ALGORITMA NAIVE BAYES PADA MATLAB**



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1. **Data Set**

Dataset yang digunakan adalah dataset Lenses yang diberi nama lenses.csv yang diambil dari [**https://archive.ics.uci.edu/**](https://archive.ics.uci.edu/)

Database tersebut digunakan sebagai Data Train dan memiliki 4 atribut, yaitu :

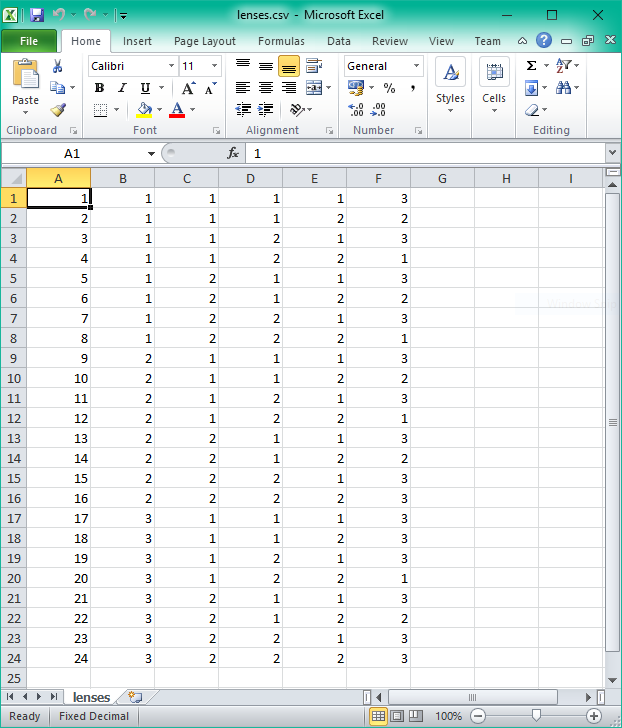
* Age of the patient : (1) young, (2) pre-presbyopic, (3) presbyopic
* Spectacle prescription : (1) myope, (2) hypermetrope
* Astigmatic : (1) no, (2) yes
* Tear production rate : (1) reduced, (2) normalI

Dataset Lenses ini memiliki class Distribution yang ada pada kolom terakhir dan bernilai :

1 : the patient should be fitted with hard contact lenses,

2 : the patient should be fitted with soft contact lenses,

3 : the patient should not be fitted with contact lenses.



**Gambar 2. Dataset Lenses.csv**

1. **Analisis**

Penelitian ini menggunakan Matlab dan Algoritma Naïve Bayes untuk mengklasifikasikan jenis lensa kacamata.

Berdasarkan logika dari perhitungan Naïve Bayes itu sendiri kemudian algoritmanya diimplementasikan ke dalam Matlab.

Berikut ini contoh perhitungan manual dari Algoritma Naïve Bayes :

Contoh dari dataset diatas, kemudian dicari class dari data test sebagai berikut :

Usia = 2

Spectacle Prescription = 2

Astigmatic = 1

Tear Production Rate = 1

Langkah 1 :

mengitung jumlah *class/ label* :

Langkah 2 :

menghitung jumlah kasus yang sama dengan *class* yang sama :

Langkah 3 :

Kalikan semua hasil variable *Hard Contact Lens, Low Contact Lens, No Contact Lens*

Langkah 4 :

Bandingkan hasil class *Hard contact lens, Soft contact lens, No contact lense* .

Karena hasil yang paling besar adalah hasil dari ( P | No Contact Lens ) maka keputusannya adalah **No Contact Lens.**

Berikut ini merupakan source code dari Algoritma Naive Bayes tersebut

**Isi code dari Button Klasifikasi adalah sebagai berikut :**

% --- Executes on button press in pushbutton1.

function pushbutton1\_Callback(hObject, eventdata, handles)

% hObject handle to pushbutton1 (see GCBO)

% eventdata reserved - to be defined in a future version of MATLAB

% handles structure with handles and user data (see GUIDATA)

age = str2double(get(handles.usia,'String'));

sp = str2double(get(handles.specpres,'String'));

ast = str2double(get(handles.astigmatic,'String'));

tear = str2double(get(handles.tear,'String'));

%baca dataset

line=1;

data=xlsread('lenses.csv',strcat('A',num2str(line),':F',num2str(line)));

while(isempty(data)==0)

line=line+1;

data=xlsread('lenses.csv',strcat('A',num2str(line),':F',num2str(line)));

end

line=line-1;

[file\_data]=xlsread('lenses.csv',strcat('A1:F',num2str(line)))

%step 1

[data\_class]=xlsread('lenses.csv',strcat('F1:F',num2str(line)))

%[class]=[data\_class(1,1)]

num\_hard\_lenses=0

index=1;

for index=1:24

if [data\_class(index,1)]==1

num\_hard\_lenses=num\_hard\_lenses+1

end

end

num\_soft\_lenses=0

index=1;

for index=1:24

if [data\_class(index,1)]==2

num\_soft\_lenses=num\_soft\_lenses+1

end

end

num\_no\_lenses=0

index=1;

for index=1:24

if [data\_class(index,1)]==3

num\_no\_lenses=num\_no\_lenses+1

end

end

P\_hard\_lenses = num\_hard\_lenses/24

P\_soft\_lenses = num\_soft\_lenses/24

P\_no\_lenses = num\_no\_lenses/24

%step 2

%age

num\_age\_hard\_lenses=0

index=1;

for index=1:24

if [file\_data(index,2)]==age && [file\_data(index,6)]==1

num\_age\_hard\_lenses=num\_age\_hard\_lenses+1

end

end

num\_age\_soft\_lenses=0

index=1;

for index=1:24

if [file\_data(index,2)]==age && [file\_data(index,6)]==2

num\_age\_soft\_lenses=num\_age\_soft\_lenses+1

end

end

num\_age\_no\_lenses=0

index=1;

for index=1:24

if [file\_data(index,2)]==age && [file\_data(index,6)]==3

num\_age\_no\_lenses=num\_age\_no\_lenses+1

end

end

P\_age\_hard\_lenses = num\_age\_hard\_lenses/num\_hard\_lenses

P\_age\_soft\_lenses = num\_age\_soft\_lenses/num\_soft\_lenses

P\_age\_no\_lenses = num\_age\_no\_lenses/num\_no\_lenses

%spectacle prescription

num\_specpres\_hard\_lenses=0

index=1;

for index=1:24

if [file\_data(index,3)]==sp && [file\_data(index,6)]==1

num\_specpres\_hard\_lenses=num\_specpres\_hard\_lenses+1

end

end

num\_specpres\_soft\_lenses=0

index=1;

for index=1:24

if [file\_data(index,3)]==sp && [file\_data(index,6)]==2

num\_specpres\_soft\_lenses=num\_specpres\_soft\_lenses+1

end

end

num\_specpres\_no\_lenses=0

index=1;

for index=1:24

if [file\_data(index,3)]==sp && [file\_data(index,6)]==3

num\_specpres\_no\_lenses=num\_specpres\_no\_lenses+1

end

end

P\_specpres\_hard\_lenses = num\_specpres\_hard\_lenses/num\_hard\_lenses

P\_specpres\_soft\_lenses = num\_specpres\_soft\_lenses/num\_soft\_lenses

P\_specpres\_no\_lenses = num\_specpres\_no\_lenses/num\_no\_lenses

%astigmatic

num\_ast\_hard\_lenses=0

index=1;

for index=1:24

if [file\_data(index,4)]==ast && [file\_data(index,6)]==1

num\_ast\_hard\_lenses=num\_ast\_hard\_lenses+1

end

end

num\_ast\_soft\_lenses=0

index=1;

for index=1:24

if [file\_data(index,4)]==ast && [file\_data(index,6)]==2

num\_ast\_soft\_lenses=num\_ast\_soft\_lenses+1

end

end

num\_ast\_no\_lenses=0

index=1;

for index=1:24

if [file\_data(index,4)]==ast && [file\_data(index,6)]==3

num\_ast\_no\_lenses=num\_ast\_no\_lenses+1

end

end

P\_ast\_hard\_lenses = num\_ast\_hard\_lenses/num\_hard\_lenses

P\_ast\_soft\_lenses = num\_ast\_soft\_lenses/num\_soft\_lenses

P\_ast\_no\_lenses = num\_ast\_no\_lenses/num\_no\_lenses

%tear production rate

num\_tear\_hard\_lenses=0

index=1;

for index=1:24

if [file\_data(index,5)]==tear && [file\_data(index,6)]==1

num\_tear\_hard\_lenses=num\_tear\_hard\_lenses+1

end

end

num\_tear\_soft\_lenses=0

index=1;

for index=1:24

if [file\_data(index,5)]==tear && [file\_data(index,6)]==2

num\_tear\_soft\_lenses=num\_tear\_soft\_lenses+1

end

end

num\_tear\_no\_lenses=0

index=1;

for index=1:24

if [file\_data(index,5)]==tear && [file\_data(index,6)]==3

num\_tear\_no\_lenses=num\_tear\_no\_lenses+1

end

end

P\_tear\_hard\_lenses = num\_tear\_hard\_lenses/num\_hard\_lenses

P\_tear\_soft\_lenses = num\_tear\_soft\_lenses/num\_soft\_lenses

P\_tear\_no\_lenses = num\_tear\_no\_lenses/num\_no\_lenses

%step 3

P\_hard\_lenses = P\_age\_hard\_lenses\*P\_specpres\_hard\_lenses\*P\_ast\_hard\_lenses\*P\_tear\_hard\_lenses

P\_soft\_lenses = P\_age\_soft\_lenses\*P\_specpres\_soft\_lenses\*P\_ast\_soft\_lenses\*P\_tear\_soft\_lenses

P\_no\_lenses = P\_age\_no\_lenses\*P\_specpres\_no\_lenses\*P\_ast\_no\_lenses\*P\_tear\_no\_lenses

%step 4

keputusan = 0;

value = 0;

if P\_hard\_lenses > P\_soft\_lenses

keputusan = 1

value = P\_hard\_lenses

else

keputusan = 2

value = P\_soft\_lenses

end

if value > P\_no\_lenses

keputusan = keputusan

value = value

else

keputusan = 3

value = P\_no\_lenses

end

switch keputusan

case 1

set(handles.hasil,'String','Hard Contact Lense');

case 2

set(handles.hasil,'String','Low Contact Lense');

case 3

set(handles.hasil,'String','No Contact Lense');

end

**Isi code dari Button Reset adalah sebagai berikut :**

% --- Executes on button press in reset.

function reset\_Callback(hObject, eventdata, handles)

% hObject handle to reset (see GCBO)

% eventdata reserved - to be defined in a future version of MATLAB

% handles structure with handles and user data (see GUIDATA)

set(handles.usia,'String','');

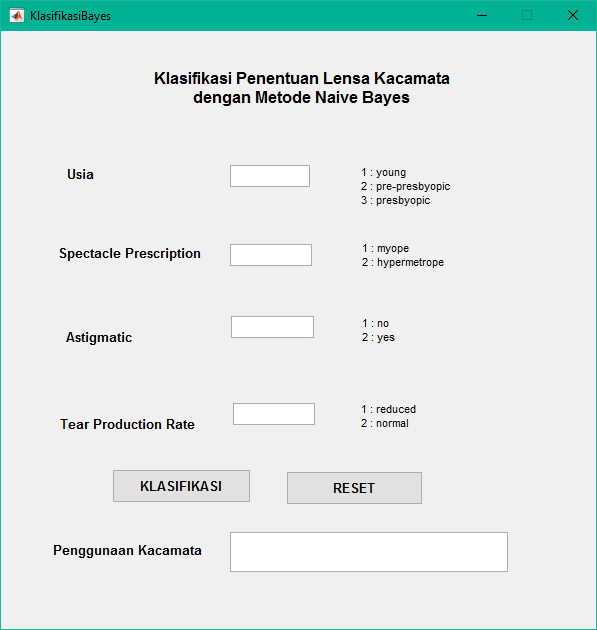
set(handles.specpres,'String','');

set(handles.astigmatic,'String','');

set(handles.tear,'String','');

set(handles.hasil,'String','');

Berikut ini merupakan GUI dari program ini :

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Contoh implementasi pada program dengan data test data baru :

