

DAFTAR PUSTAKA

- Alfita, R., & Nahari, R. V. (2020). *Pengolahan Sinyal Digital*. Malang: Media Nusa Creative.
- Ali, M. (2004). Pembelajaran Perancangan Sistem Kontrol PID Dengan Software Matlab. *Jurnal Edukasi*, 1-8.
- Ashad, B. A., Ramdaniah, Sriwijanaka, & St. Hajrah Mansyur. (2022). Pemanfaatan Aplikasi Pendeteksi Warna Pakaian Berbasis Android Bagi Penyandang Tunanetra di SLB Yukartuni Makassar. *Jurnal Abdi Masyarakat Indonesia*, 263-268.
- Candra, D. P. (2021). *Klasifikasi Suara Dengan Ekstraksi Ciri Mel Frequency Cepstral Coefficient Menggunakan Machine Learning*. Jakarta: Universitas Islam Negeri Syarif Hidayatullah.
- Heriyanto, Hartati, S., & Putra, A. E. (2018). Ekstraksi Ciri Mel Frequency Cepstral Coefficient (MFCC) Dan Rerata Coefficient Untuk Pengecekan Bacaan Al-Qur'an. *Jurnal Telematika*, 99-108.
- Jafar, N. A. (2020). *Simulasi Pembelajaran Untuk Penyandang Tunanetra Berbasis Pengenalan Sinyal Wicara Menggunakan Matlab*. Bandung: Universitas Komputer Indonesia.
- Nasution, T. (2012). Metoda Mel Frequency Cepstrum Coefficient (MFCC) untuk Mengenali Ucapan pada Bahasa Indonesia. *Jurnal Sains dan Teknologi Informasi*, 22-31.
- Nooraeni, R. (2022). Kajian Penerapan Jarak Euclidean, Manhattan, Minkowski, dan Chebyshev pada Algoritma Clustering K-Prototype. *Jurnal Sains, Aplikasi, Komputasi dan Teknologi Informasi*, 72.82.
- Noviansyah, M. (2019). *Pengenalan Dasar Matlab*. Jakarta.
- Putra, K. T. (2017). Sistem Pengenal Wicara Menggunakan Mel-Frequency Cepstral Coefficient. *Jurnal Ilmiah Semesta Teknika*, 75-80.
- Rahman, M. F. (2017). Implementasi Mel-Frequency Cepstral Coefficients Dan Chebyshev Distance Untuk Pengenalan Suara Ucapan Makhraj Huruf Hijaiyah. Riau : Universitas Islam Negeri Sultan Syarif Kasim Riau.
- Rabiner, L., & Juang, B. H. (1993). *Fundamental Of Speech Recognition*. New Jersey: PTR Prentice-Hall, Inc.
- Rismayani, Wahyuni, S., Layuk, N. S., Loly, R. H., & Daud, A. N. (2021). Desain stem Speech Recognition Penerjemah Bahasa Toraja Menggunakan Hidden Markov Model. *Jurnal Penelitian dan Informatika*, 107-119.



- Saputro, A. K., Ulum, M., Karim, A., & Alfita, R. (2020). Perancangan Smart-TV Menggunakan Perintah Suara Dengan Metode Hidden Markov Model. *Jurnal Teknik Elektro dan Komputer Triac*.
- Susanti, M., Susilo, B., & Andreswari, D. (2018). Aplikasi Speech-To-Text Dengan Metode Mel Frequency Cepstral Coefficient (MFCC) Dan Hidden Markov Model (HMM) Dalam Pencarian Kode ICD-10. *Jurnal Rekursif*, 48-58.
- Syah, A. Z., Siagian, Y., & Aswati, S. (2017). Pencirian Wicara Menggunakan Analisa Ceptral Sebagai Wujud Invers dari Fast Fourier Transform (FFT). *Jurnal Teknologi dan Sistem Informasi*, 103-110.
- Teknomo, K. (2006). Chebyshev Distance. Diakses pada 16 Mei 2023 dari Chebyshev Distance (revoledu.com) .



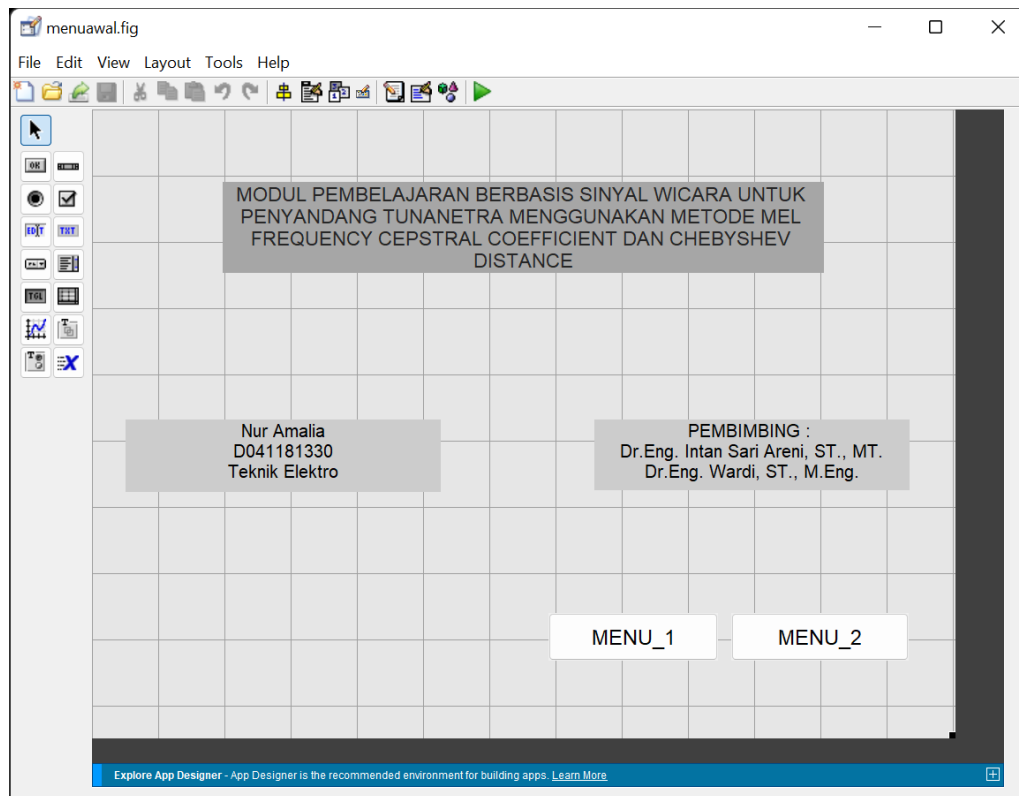
LAMPIRAN

Lampiran 1 Dokumentasi Responden Saat Pengujian

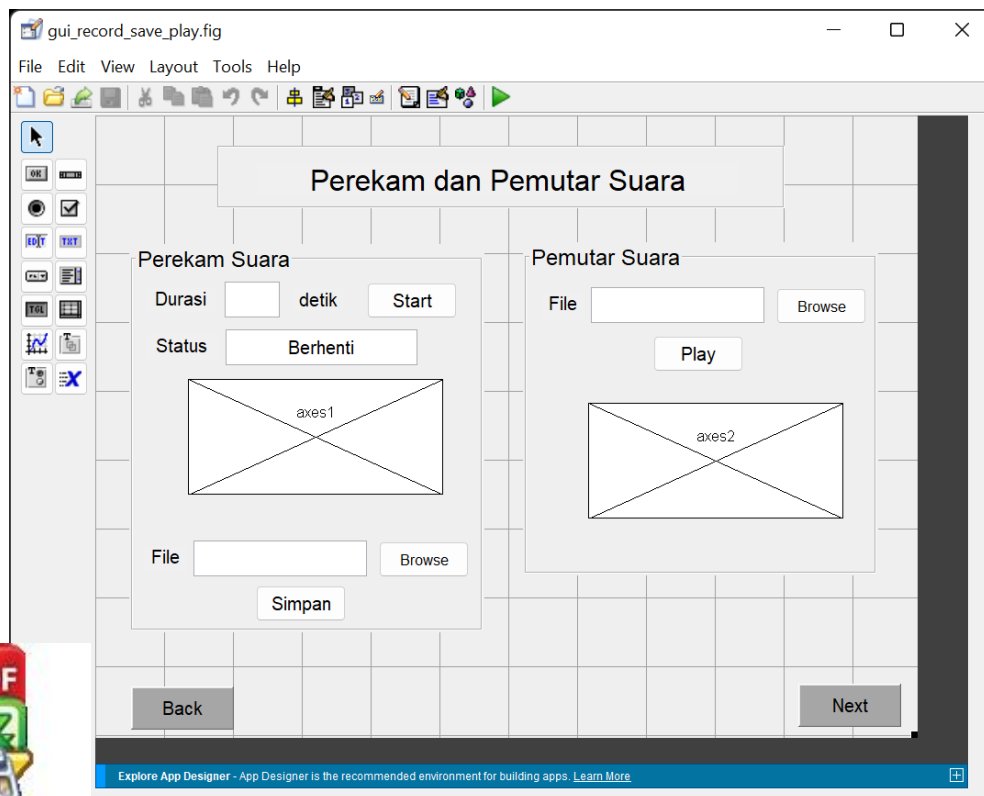




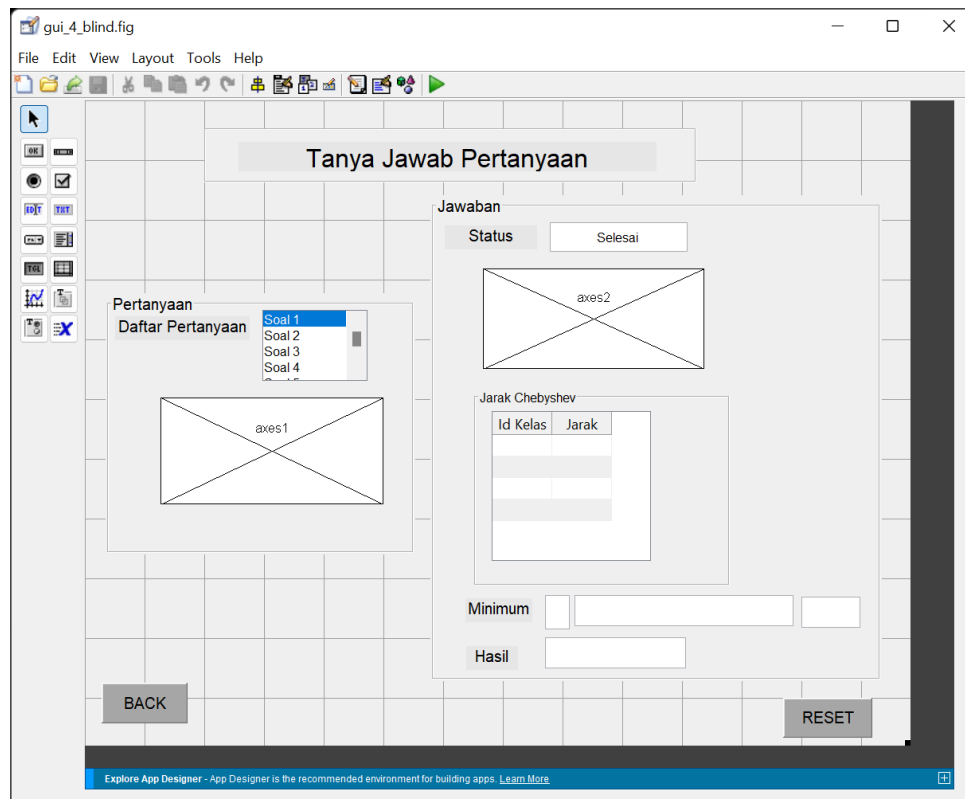
Lampiran 2 Tampilan Gui Matlab Untuk Menu Awal



Lampiran 3 Tampilan Gui Matlab Menu_1 Perekam dan Pemutar Suara



Lampiran 4 Tampilan Gui Matlab Menu_2 Tanya Jawab Pertanyaan



Lampiran 5 Kode Program Untuk Menu Awal

```
function varargout = menuawal(varargin)
% MENUAWAL MATLAB code for menuawal.fig
% MENUAWAL, by itself, creates a new MENUAWAL or raises the existing
% singleton*.
%
% H = MENUAWAL returns the handle to a new MENUAWAL or the handle to
% the existing singleton*.
%
% MENUAWAL('CALLBACK',hObject,eventData,handles,...) calls the local
% function named CALLBACK in MENUAWAL.M with the given input arguments.
%
% MENUAWAL('Property','Value',...) creates a new MENUAWAL or raises the
% existing singleton*. Starting from the left, property value pairs are
% applied to the GUI before menuawal_OpeningFcn gets called. An
% unrecognized property name or invalid value makes property application
% stop. All inputs are passed to menuawal_OpeningFcn via varargin.
%
% *See GUI Options on GUIDE's Tools menu. Choose "GUI allows only one
% instance to run (singleton)".
%
% See also: GUIDE, GUIDATA, GUIHANDLES
```

```
% Edit the above text to modify the response to help menuawal
```

```
% Last Modified by GUIDE v2.5 06-Apr-2023 16:35:48
```

```
% Begin initialization code - DO NOT EDIT
gui_Singleton = 1;
gui_State = struct('gui_Name',    mfilename, ...
    'gui_Singleton', gui_Singleton, ...
    'gui_OpeningFcn', @menuawal_OpeningFcn, ...
    'gui_OutputFcn', @menuawal_OutputFcn, ...
    'gui_LayoutFcn', [] , ...
    'gui_Callback', []);
if nargin && ischar(varargin{1})
    gui_State.gui_Callback = str2func(varargin{1});
end

if nargin
    [varargout{1:nargout}] = gui_mainfcn(gui_State, varargin{:});
else
    gui_mainfcn(gui_State, varargin{:});
end
% End initialization code - DO NOT EDIT
```

```
% --- Executes just before menuawal is made visible.
function menuawal_OpeningFcn(hObject, eventdata, handles, varargin)
% This function has no output args, see OutputFcn.
% hObject handle to figure
% a reserved - to be defined in a future version of MATLAB
% structure with handles and user data (see GUIDATA)
% command line arguments to menuawal (see VARARGIN)
enter");
default command line output for menuawal
put = hObject;
```



```

% Update handles structure
guidata(hObject, handles);

%background
ah = axes('unit', 'normalized', 'position', [0 0 1 1]);
%import bg
bg = imread('background1.jpg'); imagesc(bg);
%matikan axes dan tampilkan bg
set(ah, 'handlevisibility','off','visible','off')
% UIWAIT makes menuawal wait for user response (see UIRESUME)
% uiwait(handles.figure1);

% --- Outputs from this function are returned to the command line.
function varargout = menuawal_OutputFcn(hObject, eventdata, handles)
% varargout cell array for returning output args (see VARARGOUT);
% hObject handle to figure
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)

% Get default command line output from handles structure
varargout{1} = handles.output;

% --- Executes on button press in pushbutton2.
function pushbutton2_Callback(hObject, eventdata, handles)
% hObject handle to pushbutton2 (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)
close(menuawal);gui_record_save_play

% --- Executes on button press in pushbutton3.
function pushbutton3_Callback(hObject, eventdata, handles)
% hObject handle to pushbutton3 (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)
close(menuawal);gui_4_blind;

function edit8_Callback(hObject, eventdata, handles)
% hObject handle to edit8 (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit8 as text
% str2double(get(hObject,'String')) returns contents of edit8 as a double

% --- Executes during object creation, after setting all properties.
function edit8_CreateFcn(hObject, eventdata, handles)
% hObject handle to edit8 (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
empty - handles not created until after all CreateFcns called

```



it controls usually have a white background on Windows.
 ISPC and COMPUTER.
 isequal(get(hObject,'BackgroundColor'), get(0,'defaultUicontrolBackgroundColor'))
 ect,'BackgroundColor','white');

end

```
% --- Executes during object creation, after setting all properties.  
function figure1_CreateFcn(hObject, eventdata, handles)  
% hObject    handle to figure1 (see GCBO)  
% eventdata  reserved - to be defined in a future version of MATLAB  
% handles    empty - handles not created until after all CreateFcns called  
  
% --- Executes during object creation, after setting all properties.  
function text2_CreateFcn(hObject, eventdata, handles)  
% hObject    handle to text2 (see GCBO)  
% eventdata  reserved - to be defined in a future version of MATLAB  
% handles    empty - handles not created until after all CreateFcns called
```



Lampiran 6 Kode Program Untuk Menu_1 Tampilan Perekaman dan Pemutaran Suara

```
function varargout = gui_tanya_jawab(varargin)
% GUI_TANYA_JAWAB MATLAB code for gui_tanya_jawab.fig
%   GUI_TANYA_JAWAB, by itself, creates a new GUI_TANYA_JAWAB or raises the
%   existing
%   singleton*.
%
%   H = GUI_TANYA_JAWAB returns the handle to a new GUI_TANYA_JAWAB or the
%   handle to
%   the existing singleton*.
%
%   GUI_TANYA_JAWAB('CALLBACK',hObject,eventData,handles,...) calls the local
%   function named CALLBACK in GUI_TANYA_JAWAB.M with the given input arguments.
%
%   GUI_TANYA_JAWAB('Property','Value',...) creates a new GUI_TANYA_JAWAB or
%   raises the
%   existing singleton*. Starting from the left, property value pairs are
%   applied to the GUI before gui_tanya_jawab_OpeningFcn gets called. An
%   unrecognized property name or invalid value makes property application
%   stop. All inputs are passed to gui_tanya_jawab_OpeningFcn via varargin.
%
%   *See GUI Options on GUIDE's Tools menu. Choose "GUI allows only one
%   instance to run (singleton)".
%
% See also: GUIDE, GUIDATA, GUIHANDLES

% Edit the above text to modify the response to help gui_tanya_jawab

% Last Modified by GUIDE v2.5 26-Jan-2023 22:08:05

% Begin initialization code - DO NOT EDIT
gui_Singleton = 1;
gui_State = struct('gui_Name',    mfilename, ...
    'gui_Singleton', gui_Singleton, ...
    'gui_OpeningFcn', @gui_tanya_jawab_OpeningFcn, ...
    'gui_OutputFcn', @gui_tanya_jawab_OutputFcn, ...
    'gui_LayoutFcn', [] , ...
    'gui_Callback', []);
if nargin && ischar(varargin{1})
    gui_State.gui_Callback = str2func(varargin{1});
end

if nargin
    [varargout{1:nargout}] = gui_mainfcn(gui_State, varargin{:});
else
    gui_mainfcn(gui_State, varargin{:});
end
% End initialization code - DO NOT EDIT
```



ates just before gui_tanya_jawab is made visible.
 i_tanya_jawab_OpeningFcn(hObject,eventdata, handles, varargin)
 ction has no output args, see OutputFcn.
 handle to figure
 a reserved - to be defined in a future version of MATLAB
 structure with handles and user data (see GUIDATA)

```

% varargin  command line arguments to gui_tanya_jawab (see VARARGIN)

% Choose default command line output for gui_tanya_jawab
handles.output = hObject;

% Update handles structure
guidata(hObject, handles);

% UIWAIT makes gui_tanya_jawab wait for user response (see UIRESUME)
% uiwait(handles.figure1);

% --- Outputs from this function are returned to the command line.
function varargout = gui_tanya_jawab_OutputFcn(hObject, eventdata, handles)
% varargout  cell array for returning output args (see VARARGOUT);
% hObject    handle to figure
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Get default command line output from handles structure
varargout{1} = handles.output;

function edit4_Callback(hObject, eventdata, handles)
% hObject    handle to edit4 (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit4 as text
%        str2double(get(hObject,'String')) returns contents of edit4 as a double

% --- Executes during object creation, after setting all properties.
function edit4_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit4 (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns called

% Hint: edit controls usually have a white background on Windows.
%        See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

% --- Executes on button press in pushbutton4.
function pushbutton4_Callback(hObject, eventdata, handles)
% hObject    handle to pushbutton4 (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

global id_soal

peta_jawaban = [2 1 4 3];

pathname] = uigetfile('*.wav','Pilih file suara jawaban');
.edit4,'String',[pathname filename]);

ciri_latih

nn(ciri_latih, target, 'NumNeighbor', 1, 'Distance', 'chebyshev');

```



```

[suara,fs] = audioread([pathname filename]);
soundsc(suara,fs);

suara = suara(:,1);
[cA,cD] = dwt(suara,'haar');
%mfcc cA
x = std(cA);
y = find(suara>=x);
n = suara(y);
c = 20;
mfcc_cA = mfc_liftering(n,fs,'hamming',256,c);
%mfcc cD
x = std(cD);
y = find(suara>=x);
n = suara(y);
c = 20;
mfcc_cD = mfc_liftering(n,fs,'hamming',256,c);
ciri_uji = [mfcc_cA(2:end) mfcc_cD(2:end)];
id_kelas_uji = predict(Mdl, ciri_uji);

axes(handles.axes2); plot(suara);
if peta_jawaban(id_kelas_uji) == id_soal
    jawaban = 'BENAR';
else
    jawaban = 'SALAH';
end

% --- Executes on button press in pushbutton5.
function pushbutton5_Callback(hObject, eventdata, handles)
% hObject    handle to pushbutton5 (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

global id_soal

peta_jawaban = [2 1 4 3];

fs = 44100 ;
nBits = 16 ;
nChannels = 2 ;
ID = -1; % default audio input device

durasi = str2double(get(handles.edit1,'String'));
recObj = audiorecorder(fs,nBits,nChannels,ID);
recordblocking(recObj,durasi);
suara = getaudiodata(recObj);
%doubleArray = doubleArray .* 10;
axes(handles.axes2); plot(suara(:,1));

load data_ciri_latih

```



```

nn(ciri_latih, target, 'NumNeighbor', 1, 'Distance', 'chebyshev');

ra(:,1);
dwt(suara,'haar');

;

```

```

y = suara>=x;
n = suara(y);
c = 20;
mfcc_cA = mfc_liftering(n,fs,'hamming',256,c);
%mfcc cD
x = std(cD);
y = suara>=x;
n = suara(y);
c = 20;
mfcc_cD = mfc_liftering(n,fs,'hamming',256,c);
ciri_uji = [mfcc_cA(2:end) mfcc_cD(2:end)];
id_kelas_uji = predict(Mdl, ciri_uji);

axes(handles.axes2); plot(suara);
if peta_jawaban(id_kelas_uji) == id_soal
    jawaban = 'BENAR';
else
    jawaban = 'SALAH';
end
set(handles.edit3,'String',jawaban);

function edit1_Callback(hObject, eventdata, handles)
% hObject    handle to edit1 (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit1 as text
%        str2double(get(hObject,'String')) returns contents of edit1 as a double

% --- Executes during object creation, after setting all properties.
function edit1_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit1 (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns called

% Hint: edit controls usually have a white background on Windows.
%        See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

% --- 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 GUIDATbaA)

global id_soal

id_soal = get(handles.popupmenu1,'Value');

switch id_soal
    ,fs] = audioread('C:\Users\Asus\Documents\TA\UAS\Soal\soal 1.wav');
    ,fs] = audioread('C:\Users\Asus\Documents\TA\UAS\Soal\soal 2.wav');
    ,fs] = audioread('C:\Users\Asus\Documents\TA\UAS\Soal\soal 3.wav');

```



```

case 4
    [suara,fs] = audioread('C:\Users\Asus\Documents\TA\UAS\Soal\soal 4.wav');
case 5
    [suara,fs] = audioread('C:\Users\Asus\Documents\TA\UAS\Soal\soal 5.wav');
case 6
    [suara,fs] = audioread('C:\Users\Asus\Documents\TA\UAS\Soal\soal 6.wav');
case 7
    [suara,fs] = audioread('C:\Users\Asus\Documents\TA\UAS\Soal\soal 7.wav');
case 8
    [suara,fs] = audioread('C:\Users\Asus\Documents\TA\UAS\Soal\soal 8.wav');

end
soundsc(suara,fs);
axes(handles.axes1); plot(suara(:,1));

function edit2_Callback(hObject, eventdata, handles)
% hObject    handle to edit2 (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit2 as text
%        str2double(get(hObject,'String')) returns contents of edit2 as a double

% --- Executes during object creation, after setting all properties.
function edit2_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit2 (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns called

% Hint: edit controls usually have a white background on Windows.
%        See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

function edit3_Callback(hObject, eventdata, handles)
% hObject    handle to edit3 (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit3 as text
%        str2double(get(hObject,'String')) returns contents of edit3 as a double

% --- Executes during object creation, after setting all properties.
function edit3_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit3 (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns called

% Hint: edit controls usually have a white background on Windows.
%        See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

```



ates on button press in pushbutton2.

```

pushbutton2_Callback(hObject, eventdata, handles)
% hObject    handle to pushbutton2 (see GCBO)

```

```

% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)

global filename pathname

[filename, pathname] = uiputfile('*.wav','Simpan suara');
set(handles.edit3,'String',[pathname filename]);

% --- Executes on button press in pushbutton3.
function pushbutton3_Callback(hObject, eventdata, handles)
% hObject handle to pushbutton3 (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)

close gcbf
gui_tanya_jawab

% --- Executes on selection change in popupmenu1.
function popupmenu1_Callback(hObject, eventdata, handles)
% hObject handle to popupmenu1 (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)

% Hints: contents = cellstr(get(hObject,'String')) returns popupmenu1 contents as cell array
% contents{get(hObject,'Value')} returns selected item from popupmenu1

% --- Executes during object creation, after setting all properties.
function popupmenu1_CreateFcn(hObject, eventdata, handles)
% hObject handle to popupmenu1 (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles empty - handles not created until after all CreateFcns called

% Hint: popupmenu controls usually have a white background on Windows.
% See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

% --- Executes on button press in pushbutton6.
function pushbutton6_Callback(hObject, eventdata, handles)
% hObject handle to pushbutton6 (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)

% --- Executes during object creation, after setting all properties.
function figure1_CreateFcn(hObject, eventdata, handles)
% hObject handle to figure1 (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles empty - handles not created until after all CreateFcns called

```



Lampiran 7 Kode Program Untuk Menu_2 Tampilan Tanya Jawab Pertanyaan

```

function varargout = gui_4_blind(varargin)
% GUI_4_BLIND MATLAB code for gui_4_blind.fig
%   GUI_4_BLIND, by itself, creates a new GUI_4_BLIND or raises the existing
%   singleton*.
%
%   H = GUI_4_BLIND returns the handle to a new GUI_4_BLIND or the handle to
%   the existing singleton*.
%
%   GUI_4_BLIND('CALLBACK',hObject,eventData,handles,...) calls the local
%   function named CALLBACK in GUI_4_BLIND.M with the given input arguments.
%
%   GUI_4_BLIND('Property','Value',...) creates a new GUI_4_BLIND or raises the
%   existing singleton*. Starting from the left, property value pairs are
%   applied to the GUI before gui_4_blind_OpeningFcn gets called. An
%   unrecognized property name or invalid value makes property application
%   stop. All inputs are passed to gui_4_blind_OpeningFcn via varargin.
%
%   *See GUI Options on GUIDE's Tools menu. Choose "GUI allows only one
%   instance to run (singleton)".
%
% See also: GUIDE, GUIDATA, GUIHANDLES

% Edit the above text to modify the response to help gui_4_blind

% Last Modified by GUIDE v2.5 10-Jan-2023 22:30:03

% Begin initialization code - DO NOT EDIT
gui_Singleton = 1;
gui_State = struct('gui_Name',    mfilename, ...
    'gui_Singleton', gui_Singleton, ...
    'gui_OpeningFcn', @gui_4_blind_OpeningFcn, ...
    'gui_OutputFcn', @gui_4_blind_OutputFcn, ...
    'gui_LayoutFcn', [] , ...
    'gui_Callback', []);
if nargin && ischar(varargin{1})
    gui_State.gui_Callback = str2func(varargin{1});
end

if nargout
    [varargout{1:nargout}] = gui_mainfcn(gui_State, varargin{:});
else
    gui_mainfcn(gui_State, varargin{:});
end
% End initialization code - DO NOT EDIT

% --- Executes just before gui_4_blind is made visible.
function gui_4_blind_OpeningFcn(hObject, eventdata, handles, varargin)
% This function has no output args, see OutputFcn.
% hObject    handle to figure
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
% varargin   command line arguments to gui_4_blind (see VARARGIN)
enter");
default command line output for gui_4_blind
put = hObject;

```



```

% Update handles structure
guidata(hObject, handles);
%background
ah = axes('unit', 'normalized', 'position', [0 0 1 1]);
%import bg
bg = imread('background1.jpg'); imagesc(bg);
%matikan axes dan tampilkan bg
set(ah, 'handlevisibility','off','visible','off')
% UIWAIT makes gui_4_blind wait for user response (see UIRESUME)
% uiwait(handles.figure1);

global id_soal

id_soal = 0;

% --- Outputs from this function are returned to the command line.
function varargout = gui_4_blind_OutputFcn(hObject, eventdata, handles)
% varargout cell array for returning output args (see VARARGOUT);
% hObject handle to figure
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)

% Get default command line output from handles structure
varargout{1} = handles.output;

% --- Executes on selection change in listbox1.
function listbox1_Callback(hObject, eventdata, handles)
% hObject handle to listbox1 (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)

% Hints: contents = cellstr(get(hObject,'String')) returns listbox1 contents as cell array
% contents{get(hObject,'Value')} returns selected item from listbox1

% --- Executes during object creation, after setting all properties.
function listbox1_CreateFcn(hObject, eventdata, handles)
% hObject handle to listbox1 (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles empty - handles not created until after all CreateFcns called

% Hint: listbox controls usually have a white background on Windows.
% See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

function edit1_Callback(hObject, eventdata, handles)
% hObject handle to edit1 (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit1 as text
% double(get(hObject,'String')) returns contents of edit1 as a double

% --- Executes during object creation, after setting all properties.
function edit1_CreateFcn(hObject, eventdata, handles)
% hObject handle to edit1 (see GCBO)

```



```

% eventdata reserved - to be defined in a future version of MATLAB
% handles empty - handles not created until after all CreateFcns called

% Hint: edit controls usually have a white background on Windows.
% See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

function edit2_Callback(hObject, eventdata, handles)
% hObject handle to edit2 (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit2 as text
% str2double(get(hObject,'String')) returns contents of edit2 as a double

% --- Executes during object creation, after setting all properties.
function edit2_CreateFcn(hObject, eventdata, handles)
% hObject handle to edit2 (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles empty - handles not created until after all CreateFcns called

% Hint: edit controls usually have a white background on Windows.
% See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

% --- Executes on key press with focus on figure1 and none of its controls.
function figure1_KeyPressFcn(hObject, eventdata, handles)
% hObject handle to figure1 (see GCBO)
% eventdata structure with the following fields (see MATLAB.UI.FIGURE)
% Key: name of the key that was pressed, in lower case
% Character: character interpretation of the key(s) that was pressed
% Modifier: name(s) of the modifier key(s) (i.e., control, shift) pressed
% handles structure with handles and user data (see GUIDATA)

global id_soal

peta_jawaban = [1 2 3 4 5 6 7 8];

fs = 44100 ;
nBits = 16 ;
nChannels = 2 ;
ID = -1; % default audio input device
durasi = 3;

%disp(eventdata.Key);
kunci = eventdata.Key;
if not(strcmp(kunci,'return'))
    id_soal = id_soal+1;
    l_soal

[ra,fs] = audioread('C:\Users\Asus\Documents\TA\UAS\Soal\soal 1.wav');
[ra,fs] = audioread('C:\Users\Asus\Documents\TA\UAS\Soal\soal 2.wav');

```



```

[suara,fs] = audioread('C:\Users\Asus\Documents\TA\UAS\Soal\soal 3.wav');
case 4
[suara,fs] = audioread('C:\Users\Asus\Documents\TA\UAS\Soal\soal 4.wav');
case 5
[suara,fs] = audioread('C:\Users\Asus\Documents\TA\UAS\Soal\soal 5.wav');
case 6
[suara,fs] = audioread('C:\Users\Asus\Documents\TA\UAS\Soal\soal 6.wav');
case 7
[suara,fs] = audioread('C:\Users\Asus\Documents\TA\UAS\Soal\soal 7.wav');
case 8
[suara,fs] = audioread('C:\Users\Asus\Documents\TA\UAS\Soal\soal 8.wav');

otherwise
id_soal = 1;
[suara,fs] = audioread('C:\Users\Asus\Documents\TA\UAS\Soal\soal 1.wav');

end
set(handles.listbox1,'Value',id_soal);
soundsc(suara,fs);
axes(handles.axes1); plot(suara(:,1));

else
set(handles.edit1,'String','Merekam');
recObj = audiorecorder(fs,nBits,nChannels,ID);
recordblocking(recObj,durasi);
suara = getaudiodata(recObj);
%doubleArray = doubleArray .* 10;
axes(handles.axes2); plot(suara(:,1));

load('C:\Users\Asus\Documents\TA\UAS\data_ciri_latih');
%load('C:\Users\Asus\Documents\TA\Matlab DWT MFCC PCA\hasil_training_jst');
Mdl = fitcknn(ciri_latih, target, 'NumNeighbor', 5, 'Distance', 'chebychev');

suara = suara(:,1);
[cA,cD] = dwt(suara,'haar');
%mfcc cA
x = std(cA);
y = find(suara>=x);
n = suara(y);
c = 20;
mfcc_cA = mfc_liftering(n,fs,'hamming',256,c);
%mfcc cD
x = std(cD);
y = find(suara>=x);
n = suara(y);
c = 20;
mfcc_cD = mfc_liftering(n,fs,'hamming',256,c);
ciri_uji = [mfcc_cA(2:end) mfcc_cD(2:end)];
id_kelas_uji = predict(Mdl, ciri_uji);
%id_kelas_uji = round(net(ciri_uji));
if id_kelas_uji < 1
id_kelas_uji = 1;
_kelas_uji > length(nama_kelas)
as_uji = length(nama_kelas);

dles.axes2); plot(suara);
awaban(id_kelas_uji) == id_soal
an = 'BENAR';

```



```

[suara_benar,fs_benar] = audioread('C:\Users\Asus\Documents\TA\UAS\Hasil\benar.wav');
soundsc(suara_benar,fs_benar);
else
    jawaban = 'SALAH';
    [suara_salah,fs_salah] = audioread('C:\Users\Asus\Documents\TA\UAS\Hasil\salah.wav');
    soundsc(suara_salah,fs_salah);
end

matrik_jarak = zeros(length(target),2);
for i = 1:length(target)
    jarak = sqrt(sum((ciri_uji - ciri_latih(i,:)).^2));
    matrik_jarak(i,:) = [target(i) jarak];
end
[jarak_min,~] = min(matrik_jarak(:,2));
[jarak_terurut, id_urutan] = sort(matrik_jarak(:,2));

set(handles.uitable3,'Data',matrik_jarak);
set(handles.edit6,'String',num2str(id_kelas_uji));
set(handles.edit7,'String',nama_kelas(id_kelas_uji));
set(handles.edit8,'String',num2str(jarak_min));
set(handles.edit2,'String',jawaban);
set(handles.edit1,'String','Selesai');

%set(handles.uitable2,'Data',[matrik_jarak(id_urutan,1),jarak_terurut]);
end

% --- Executes on key press with focus on figure1 or any of its controls.
function figure1_WindowKeyPressFcn(hObject, eventdata, handles)
% hObject    handle to figure1 (see GCBO)
% eventdata  structure with the following fields (see MATLAB.UI.FIGURE)
%   Key: name of the key that was pressed, in lower case
%   Character: character interpretation of the key(s) that was pressed
%   Modifier: name(s) of the modifier key(s) (i.e., control, shift) pressed
% handles    structure with handles and user data (see GUIDATA)

% --- 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)
close gcbf
gui_4_blind

function edit3_Callback(hObject, eventdata, handles)
% hObject    handle to edit3 (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit3 as text
%        str2double(get(hObject,'String')) returns contents of edit3 as a double

% --- Executes during object creation, after setting all properties.
it3_CreateFcn(hObject, eventdata, handles)
    handle to edit3 (see GCBO)
    a reserved - to be defined in a future version of MATLAB
    empty - handles not created until after all CreateFcns called

it controls usually have a white background on Windows.

```



```

% See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

function edit4_Callback(hObject, eventdata, handles)
% hObject handle to edit4 (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit4 as text
% str2double(get(hObject,'String')) returns contents of edit4 as a double

% --- Executes during object creation, after setting all properties.
function edit4_CreateFcn(hObject, eventdata, handles)
% hObject handle to edit4 (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles empty - handles not created until after all CreateFcns called

% Hint: edit controls usually have a white background on Windows.
% See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

function edit5_Callback(hObject, eventdata, handles)
% hObject handle to edit5 (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit5 as text
% str2double(get(hObject,'String')) returns contents of edit5 as a double

% --- Executes during object creation, after setting all properties.
function edit5_CreateFcn(hObject, eventdata, handles)
% hObject handle to edit5 (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles empty - handles not created until after all CreateFcns called

% Hint: edit controls usually have a white background on Windows.
% See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

% --- Executes on button press in pushbutton2.
function pushbutton2_Callback(hObject, eventdata, handles)
% hObject handle to pushbutton2 (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)
close(gui_4_blind);gui_record_save_play;

```



ites on key release with focus on figure1 and none of its controls.
figure1_KeyReleaseFcn(hObject, eventdata, handles)

handle to figure1 (see GCBO)
a structure with the following fields (see MATLAB.UI.FIGURE)
ame of the key that was released, in lower case
ter: character interpretation of the key(s) that was released

```

% Modifier: name(s) of the modifier key(s) (i.e., control, shift) released
% handles    structure with handles and user data (see GUIDATA)

% --- Executes on selection change in popupmenu1.
function popupmenu1_Callback(hObject, eventdata, handles)
% hObject    handle to popupmenu1 (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: contents = cellstr(get(hObject,'String')) returns popupmenu1 contents as cell array
%    contents{get(hObject,'Value')} returns selected item from popupmenu1

% --- Executes during object creation, after setting all properties.
function popupmenu1_CreateFcn(hObject, eventdata, handles)
% hObject    handle to popupmenu1 (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns called

% Hint: popupmenu controls usually have a white background on Windows.
%    See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

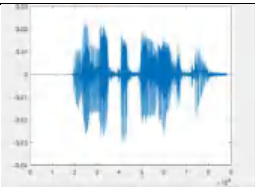
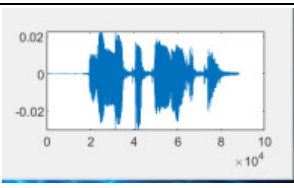
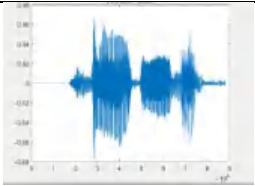
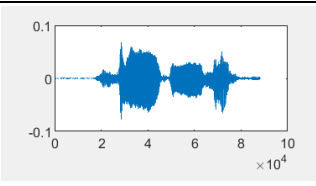
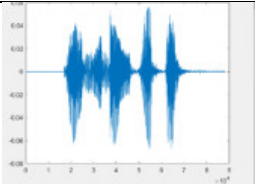
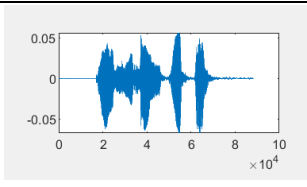
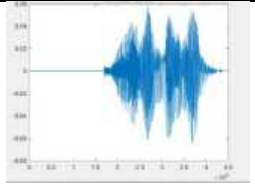
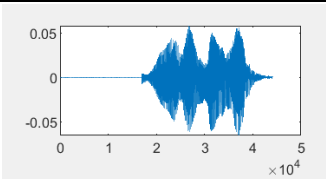
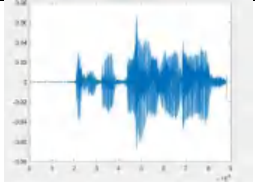
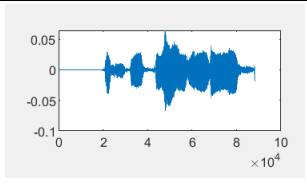
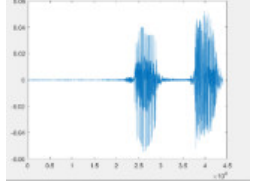
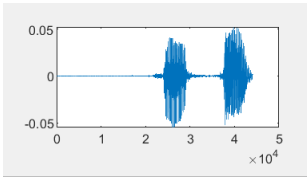
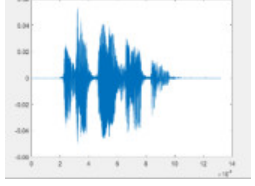
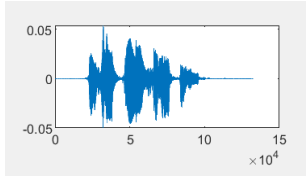
% --- Executes during object creation, after setting all properties.
function uipanel4_CreateFcn(hObject, eventdata, handles)
% hObject    handle to uipanel4 (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns called

% --- Executes during object creation, after setting all properties.
function figure1_CreateFcn(hObject, eventdata, handles)
% hObject    handle to figure1 (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns called

```



Lampiran 8 Tampilan frekuensi suara pada metode MFCC

Jawaban	Suara Dengan MFCC	Suara Tanpa MFCC
1		
2		
3		
4		
5		
6		
7		
8	