***Scientific Calculator***

*Made by: Group 11*

**

***Group Students***

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***Content***

* Introduction about the program
* The program codes
* Problems encountered



***First: Introduction***

The program is a basic and a scientific calculator which can make **basic features** as: logical operations, roots, factorial, absolute values, sign change, additive and multiplicative inverse, percent and changing from fraction to decimal and from decimal to fraction. The calculator can also make **scientific features** as: differentiation, integration, plotting, dealing with exponential, trigonometric, hyperbolic, logarithmic functions and solving equations.

***Second: The Program codes***

function varargout = calc(varargin)

gui\_Singleton = 1;

gui\_State = struct('gui\_Name', mfilename, ...

'gui\_Singleton', gui\_Singleton, ...

'gui\_OpeningFcn', @calc\_OpeningFcn, ...

'gui\_OutputFcn', @calc\_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

function calc\_OpeningFcn(hObject, ~, handles, varargin)

handles.output = hObject;

guidata(hObject, handles);

axes(handles.axes3)

matlabImage = imread('C:\Users\admin\Downloads\images 1.jpeg');

image(matlabImage)

axis off

axis image

function varargout = calc\_OutputFcn(~, ~, handles)

varargout{1} = handles.output;

function four\_Callback(~, ~, handles)

str=get(handles.inputastext,'string');

str=strcat(str,('4'));

set(handles.inputastext,'string',str);

function one\_Callback(~, ~, handles)

str=get(handles.inputastext,'string');

str=strcat(str,('1'));

set(handles.inputastext,'string',str);

function zero\_Callback(hObject, eventdata, handles)

str=get(handles.inputastext,'string');

str=strcat(str,('0'));

set(handles.inputastext,'string',str);

function three\_Callback(hObject, eventdata, handles)

str=get(handles.inputastext,'string');

str=strcat(str,('3'));

set(handles.inputastext,'string',str);

function decimal\_Callback(hObject, eventdata, handles)

str=get(handles.inputastext,'string');

str=strcat(str,('.'));

set(handles.inputastext,'string',str);

function six\_Callback(hObject, eventdata, handles)

str=get(handles.inputastext,'string');

str=strcat(str,('6'));

set(handles.inputastext,'string',str);

function five\_Callback(hObject, eventdata, handles)

str=get(handles.inputastext,'string');

str=strcat(str,('5'));

set(handles.inputastext,'string',str);

function two\_Callback(hObject, eventdata, handles)

str=get(handles.inputastext,'string');

str=strcat(str,('2'));

set(handles.inputastext,'string',str);

function signchange\_Callback(hObject, eventdata, handles)

str=get(handles.inputastext,'string');

s=str2double(str);

e=-(s);

t=num2str(e);

set(handles.inputastext,'string',t);

function seven\_Callback(hObject, eventdata, handles)

str=get(handles.inputastext,'string');

str=strcat(str,('7'));

set(handles.inputastext,'string',str);

function nine\_Callback(hObject, eventdata, handles)

str=get(handles.inputastext,'string');

str=strcat(str,('9'));

set(handles.inputastext,'string',str);

function eight\_Callback(hObject, eventdata, handles)

str=get(handles.inputastext,'string');

str=strcat(str,('8'));

set(handles.inputastext,'string',str);

function add\_Callback(hObject, eventdata, handles)

str=get(handles.inputastext,'string');

str=strcat(str,'+');

set(handles.inputastext,'string',str);

function sub\_Callback(hObject, eventdata, handles)

str=get(handles.inputastext,'string');

str=strcat(str,'-');

set(handles.inputastext,'string',str);

function mul\_Callback(hObject, eventdata, handles)

str=get(handles.inputastext,'string');

str=strcat(str,'\*');

set(handles.inputastext,'string',str);

function div\_Callback(hObject, eventdata, handles)

str=get(handles.inputastext,'string');

str=strcat(str,'/');

set(handles.inputastext,'string',str);

function Squareroot\_Callback(hObject, eventdata, handles)

str=get(handles.inputastext,'string');

str=strcat(str,'sqrt(');

set(handles.inputastext,'string',str);

function percent\_Callback(hObject, eventdata, handles)

str=get(handles.inputastext,'string');

s=str2double(str);

per=s/100;

t=num2str(per);

set(handles.textasoutput,'string',t);

function inverse\_Callback(hObject, eventdata, handles)

str=get(handles.inputastext,'string');

str=strcat(str,'1/');

set(handles.inputastext,'string',str);

function equal\_Callback(hObject, eventdata, handles)

str=get(handles.inputastext,'string');

str=eval(str);

set(handles.textasoutput,'string',str);

function clear\_Callback(hObject, eventdata, handles)

set(handles.inputastext,'string','');

set(handles.textasoutput,'string','');

set(handles.edit1,'string','');

function derivative\_Callback(hObject, eventdata, handles)

syms x;

input = get(handles.edit1, 'string');

input = strcat('@(x) ',input);

fx = str2func(input);

res = diff(fx,x);

set(handles.textasoutput, 'string', char(res));

function integration\_Callback(hObject, eventdata, handles)

syms x;

input = get(handles.edit1, 'string');

input = strcat('@(x) ',input);

fx = str2func(input);

res = int(fx,x);

set(handles.textasoutput, 'string', char(res));

function plot\_Callback(hObject, eventdata, handles)

a=get(handles.edit1,'string');

x = -5:0.1:5;

axes(handles.axes1)

comet(eval(a))

function solve\_Callback(hObject, eventdata, handles)

syms x;

input = get(handles.edit1, 'string');

input = strcat('@(x) ',input);

fx = str2func(input);

res = solve(fx,x);

set(handles.textasoutput, 'string', char(res));

function cos\_Callback(hObject, eventdata, handles)

str=get(handles.inputastext,'string');

str=strcat(str,'cosd(');

set(handles.inputastext,'string',str);

function power\_Callback(hObject, eventdata, handles)

str=get(handles.inputastext,'string');

str=strcat(str,'^');

set(handles.inputastext,'string',str);

function bracket1\_Callback(hObject, eventdata, handles)

str=get(handles.inputastext,'string');

str=strcat(str,('('));

set(handles.inputastext,'string',str);

function bracket2\_Callback(hObject, eventdata, handles)

str=get(handles.inputastext,'string');

str=strcat(str,(')'));

set(handles.inputastext,'string',str);

function tan\_Callback(hObject, eventdata, handles)

str=get(handles.inputastext,'string');

str=strcat(str,'tand(');

set(handles.inputastext,'string',str);

function sin\_Callback(hObject, eventdata, handles)

str=get(handles.inputastext,'string');

str=strcat(str,'sind(');

set(handles.inputastext,'string',str);

function edit1\_Callback(hObject, eventdata, handles)

function edit1\_CreateFcn(hObject, eventdata, handles)

if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUicontrolBackgroundColor'))

set(hObject,'BackgroundColor','white');

end

function pi\_Callback(hObject, eventdata, handles)

str=get(handles.inputastext,'string');

str=strcat(str,('pi'));

set(handles.inputastext,'string',str);

function log\_Callback(hObject, eventdata, handles)

str=get(handles.inputastext,'string');

str=strcat(str,'log10(');

set(handles.inputastext,'string',str);

function ln\_Callback(hObject, eventdata, handles)

str=get(handles.inputastext,'string');

str=strcat(str,'log(');

set(handles.inputastext,'string',str);

function expo\_Callback(hObject, eventdata, handles)

str=get(handles.inputastext,'string');

str=strcat(str,'exp(');

set(handles.inputastext,'string',str);

function root\_Callback(hObject, eventdata, handles)

str=get(handles.inputastext,'string');

str=strcat(str,'^(1/');

set(handles.inputastext,'string',str);

function factorial\_Callback(hObject, eventdata, handles)

str=get(handles.inputastext,'string');

str=strcat(str,'factorial(');

set(handles.inputastext,'string',str);

function Sinh\_Callback(hObject, eventdata, handles)

str=get(handles.inputastext,'string');

str=strcat(str,'sinh(');

set(handles.inputastext,'string',str);

function Cosh\_Callback(hObject, eventdata, handles)

str=get(handles.inputastext,'string');

str=strcat(str,'cosh(');

set(handles.inputastext,'string',str);

function Tanh\_Callback(hObject, eventdata, handles)

str=get(handles.inputastext,'string');

str=strcat(str,'tanh(');

set(handles.inputastext,'string',str);

function Absolute\_Callback(hObject, eventdata, handles)

str=get(handles.inputastext,'string');

str=strcat(str,'abs(');

set(handles.inputastext,'string',str);

function dtof\_Callback(hObject, eventdata, handles)

str=get(handles.inputastext,'string');

str=strcat(str,'rat(');

set(handles.inputastext,'string',str);

function inversesin\_Callback(hObject, eventdata, handles)

str=get(handles.inputastext,'string');

str=strcat(str,'asind(');

set(handles.inputastext,'string',str);

function inversecos\_Callback(hObject, eventdata, handles)

str=get(handles.inputastext,'string');

str=strcat(str,'acosd(');

set(handles.inputastext,'string',str);

function inversetan\_Callback(hObject, ~, handles)

str=get(handles.inputastext,'string');

str=strcat(str,'atand(');

set(handles.inputastext,'string',str);

function ftod\_Callback(~, ~, handles)

str=get(handles.inputastext,'string');

str=strcat(str,'double(');

set(handles.inputastext,'string',str);

function tenpower\_Callback(hObject, ~, handles)

str=get(handles.inputastext,'string');

str=strcat(str,'\*10^');

set(handles.inputastext,'string',str);

***Third: Problems Encountered***

**We faced some problems in our program as:**

* Doing differentiation
* Doing integration
* Plotting
* Making the interface

**How we faced these problems:**

* As for the interface we got help from the YouTube about the work with the GUI
* As for the differentiation, integration, and plotting we referred to mathworks and what we have studied

(https://www.mathworks.com)