MATLAB programming course for beginners, supported by Wagatsuma Lab@Kyutech

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Specifications and requirements

1. @Time : 2021-5-19
2. @Author : Hiroaki Wagatsuma
3. @Site : (1) https://github.com/hirowgit/1B0_matla_optmization_course
4. @Site : (2) https://github.com/hirowgit/1B1_matlab_signal_analysis_course
5. @IDE : MATLAB R2018a
6. @File : (1) TSP_lecture3.m
7. @File : (2) lec1D_A3_PLF_solver_Normal.m

Main program

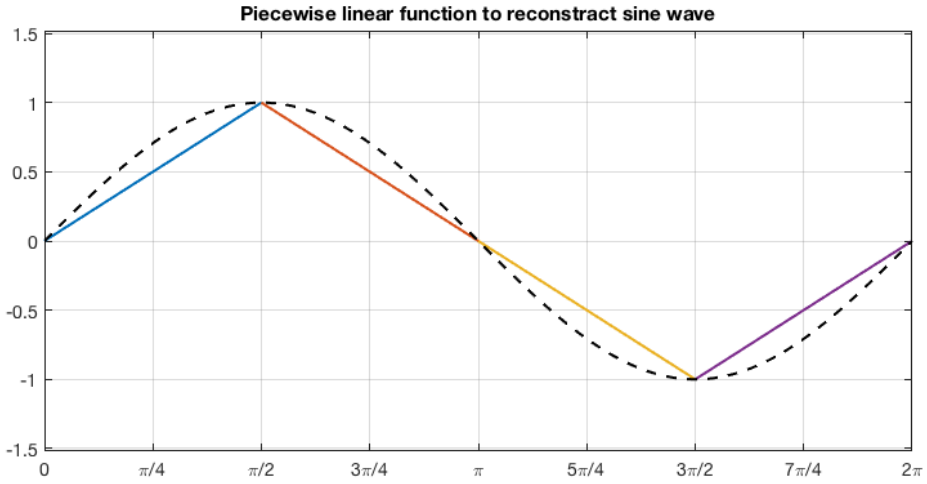
clear all

```
close all

syms x y a b
```

```
% y==a*x+b

S1=solve(a*pi/2+b==1,a*pi+b==0);
fprintf('Solution(0): y = (%s)*x\r\n',-S1.a);
fprintf('Solution(1): y = (%s)*x + (%s)\r\n',S1.a,S1.b);

S2=solve(a*3*pi/2+b==-1,a*pi+b==0);
fprintf('Solution(2): y = (%s)*x + (%s)\r\n',S2.a,S2.b);

S3=solve(a*3*pi/2+b==-1,a*2*pi+b==0);
fprintf('Solution(3): y = (%s)*x + (%s)\r\n',S3.a,S3.b);

fprintf('\r\n \r\n');

figure(2);clf
set(2,'name','piecewise_linear','Position',[720   820   870   400]);

dT=pi/100;
t0=0:dT:pi/2;
a0=-S1.a;   b0=0;

t1=pi/2:dT:pi;
a1=S1.a; b1=S1.b;

t2=pi:dT:3*pi/2;
a2=S2.a; b2=S2.b;

t3=3*pi/2:dT:2*pi;
a3=S3.a; b3=S3.b;

plot(t0,a0*t0+b0,t1,a1*t1+b1,t2,a2*t2+b2,t3,a3*t3+b3,[t0 t1 t2
 t3],sin([t0 t1 t2 t3]),'k--','LineWidth',2);

set(gca,'xlim',[0,2*pi],'ylim',[-1.2,1.2],'FontSize',14);

xtickpoint=0:pi/4:2*pi;
xlabel={'0','\pi/4','\pi/2','3\pi/4','\pi','5\pi/4','3\pi/2','7\pi/4','2\pi'};
set(gca,'xtick',xtickpoint,'xticklabel',xlabel)
title('Piecewise linear function to reconstract sine wave');
grid on;
axis equal;

datafname='m_figures';
save_fig;
```

```
Solution(0): y = (2/pi)*x
Solution(1): y = (-2/pi)*x + (2)
Solution(2): y = (-2/pi)*x + (2)
Solution(3): y = (2/pi)*x + (-4)


Warning: The figure is too large for the page and will be cut off.
 Resize the
```

```
figure, adjust the output size by setting the figure's PaperPosition
 property,
use the 'print' command with either the  '-bestfit' or '-fillpage'
 options, or
use the 'Best fit' or 'Fill page' options on the 'Print Preview'
 window.
```



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