

```

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
PROGRAM FOR GENERATION OF PULSE-WIDTH-MODULATION PULSE
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
FILE NAME: "PWM.m" 02/22/2008 a.ito
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
clear; clc; clf; close all; % INITIALIZATION
set(0,'DefaultUiControlFontSize',18); set(0,'DefaultAxesFontSize',18); set(0,'DefaultTextFontSize',18);
set(0,'DefaultLineLineWidth',2); set(0,'DefaultAxesLineLineWidth',1); set(0,'DefaultTextLineLineWidth',2);
set(0,'DefaultTextFontName','Helvetica'); set(0,'DefaultAxesFontName','Helvetica');

%%
Tw=2*10^-3; % HOLDING TIME
freq=10; % SINUSOIDAL FUNCTION DATA
T=1/freq;

ts=10^-5; % TIME DATA
tend=1;
t=(0:ts:tend);

y0=sin(2*pi*t/T); % ORIGINAL SINUSOIDAL WAVE

PHI=2*pi*Tw/T; % CHNGE INTO PHASE-DMAIN
vth=sin((pi-PHI)/2); % LEVEL COMPARATOR
y1=sign(y0-vth); % DIGITIZING
y1=(y1+1)/2;

indx=find(y1(1:round(T/ts))==1);
indxL=min(indx); indxH=max(indx);
Tw_cal=t(indxH)-t(indxL)

figure(1); m=2; n=1; % PLOT RESULTS
subplot(m,n,1); plot(t,y0); xlim([0 tend]); ylim([-1.1 1.1]); title(sprintf('f= %.0f Hz',freq));
subplot(m,n,2); plot(t,y1); xlim([0 tend]); ylim([-0.1 1.1]); title(sprintf('Tw= %.1f ms',Tw_cal*1000));

```

