```
function data = Max_SLM_A_Fast_44p1_kHz( pZ, idxStart, idxStop )

% pZ = Unweighted sound pressure, pa
% fs = Sampling frequency
% Frequency Weighting = Z
% Time Weighting = fast

fs = 44100; % Function is only valid for 44.1 kHz

%-------------------------------------------------------------------------
%  A-Weighting - Overall
%-------------------------------------------------------------------------

load AFilter_fs_44p1_kHz.mat B A % Load filters for A-weighting
pA = Compute_A_Weighting_44p1_kHz( pZ, B, A );

%-------------------------------------------------------------------------
%  Exponential Time Window Averaging - Overall
%-------------------------------------------------------------------------
% Time weighting must be done last since it operates on the pressure
% squared, not the pressure, hince a non-linear operation

spl = Compute_Fast_Time_Weighting_44p1_kHz( pA );

%-------------------------------------------------------------------------
% Statistical Metrics - Overall Levels
%-------------------------------------------------------------------------
% SUMMARY OF MAX 1/3 OBS
% FIND MAX OF OVERALL
% COMPUTE 1/3 OB FROM BEGINING UP TO MAX
% TAKE THE MAX VALUE AT THE TIME ASSOCIATED WITH MAX OF OVERALL

[ maxSPL, idxMaxSPL ] = max( spl( idxStart : idxStop ) ); % Only search for max between triggers
idxMaxSPL = idxMaxSPL + idxStart; % makes idxMaxSPL correct for full signal

%-------------------------------------------------------------------------
%  Generate One-Third Octave Band Sub-Channels
%-------------------------------------------------------------------------

% Load one-third octave band filters from 315 Hz to 5 kHz
load FOBFiltersNHTSA Hd F0 % Note we are using this version to get 315 Hz to 5 kHz
% Each row contains the time signal associated with a specific 1/3 OB

% Note that the value associated with the maximum is AT idMaxSPL for all
% 1/3 OBs, but we need earlier part of signal for filter stabilization
oneThirdOB_pA = Compute_One_Third_Octave_Bands_44p1_kHz_Hd( Hd, pA( 1 : idxMaxSPL ) );

%-------------------------------------------------------------------------
%  Exponential Time Window Averaging - One-Third Octave Bands
%-------------------------------------------------------------------------
```

```
% Time weighting must be done last since it operates on the pressure
% squared, not the pressure

% Initialize OBL
oneThirdOBSPLs = zeros( size( oneThirdOB_pA ) );
% Each row is a 1/3 OB, each column is the Level at the associated time

for ink = 1 : length( Hd )
    oneThirdOBSPLs( ink, : ) = ...
        Compute_Fast_Time_Weighting_44p1_kHz( oneThirdOB_pA( ink, : ) );
end

%-------------------------------------------------------------------------
% Statistical Metrics - One-Third Octave Bands
%-------------------------------------------------------------------------

% Statistics correlating to Overall Level Statistics, e.g. max of LAfMax
% At max relative to overall level
OTOBsAtMax = oneThirdOBSPLs( :, end); % Computation stopped at idxMaxSPL

%-------------------------------------------------------------------------
% Format Results
%-------------------------------------------------------------------------

data.timeWeighting = 'fast';
data.frequencyWeighting = 'A';
data.fs = fs;
data.fc = F0;
data.idxSPL = idxMaxSPL;

% All Data Below are A-weighted
data.maxSPL = round( 10 * maxSPL ) / 10;
data.minSPL = [];
data.oneThirdOctaveBandLevelsAtMax = round ( 10 * OTOBsAtMax ) / 10;
data.oneThirdOctaveBandLevelsAtMin = [];
```