```
%{
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    Last Edited: 3/10/2021
    Purpose: used for questions 3 and 4 of prelab 7
%}
```

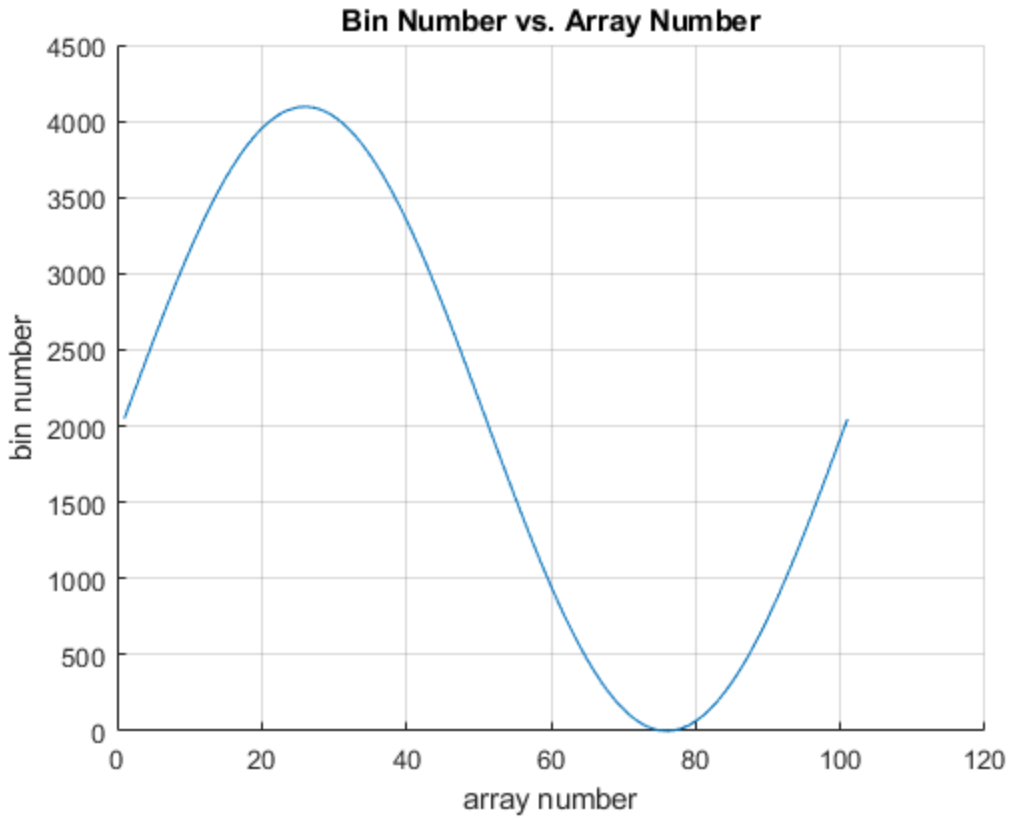
Housekeeping

```
clear all;
close all;

% %% Q3
% min_voltage = 0;
% max_voltage = 3.3;
% %initialize voltages and bits
% voltages = [0 0.25 0.5 0.75 1 1.25 1.5 1.75 2 2.25 2.5 2.75 3 3.25];
% bits = [4, 8 , 12];
%
% %loop through all bits
% for i = bits
%     %create new fig
%     figure('Name', strcat(num2str(i),' bits [decimal]'));
%     hold on;
%     grid on;
%     title(strcat('Bin number [ decimal ] vs. Voltage, Bits:
 ',num2str(i)))
%     xlabel('Voltage [ V ]')
%     ylabel('bin [decimal]')
%     %assign voltage to bin
%     for j = 1:length(voltages)
%         bin(j) = Voltage2Bin(voltages(j),min_voltage,max_voltage,i);
%     end
%     plot(voltages,bin)
%     yticks(bin) %adjust ticks to occur only at bins
%
%     %convert decimal bins to binary and plot
%     %will just convert the bin number to a character string
 representing
%     % the bin number in base 2
%     bins2binary = dec2bin(bin);
%     figure('Name', strcat(num2str(i),' bits [binary]'));
%     hold on;
%     grid on;
%     title(strcat('Bin number [ binary ] vs. Voltage, Bits:
 ',num2str(i)))
%     yticks(bin)
%     yticklabels(bins2binary)
%     xlabel('Voltage [ V ]')
%     ylabel('bin [binary]')
%     plot(voltages,bin)
% end
```

```
% Q4

% get voltage inputs using sin wave eqn
% set time scale for one period
t = 0:0.01:1;
v = 1.65 + 1.65*sin(2*pi*t);
%initialize bits
bits = 12;
%get range
max_voltage = max(v);
min_voltage = min(v);
k = 1; %iterator for indexing
for i = v
   bins(k) = Voltage2Bin(i,min_voltage,max_voltage,bits);
   k = k + 1;
end
%plot figure
figure('Name', 'binvarr')
hold on;
grid on;
title('Bin Number vs. Array Number')
xlabel('array number')
ylabel('bin number')
plot([1:length(v)],bins)
```



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