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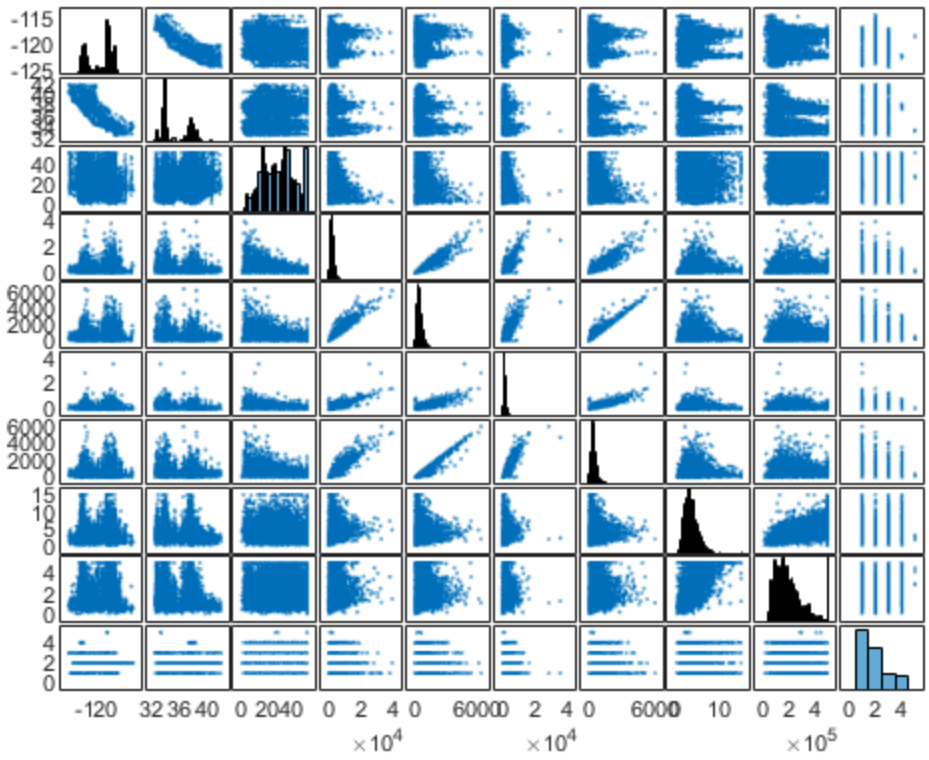
BE606 HW3 Problem 1

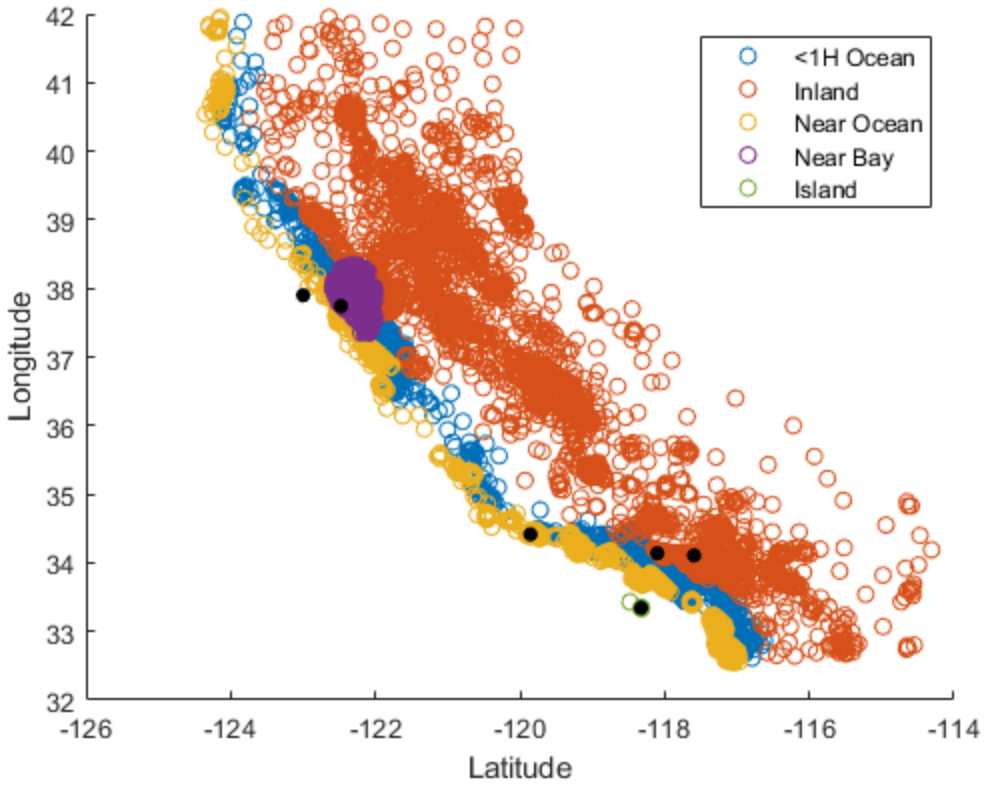
```
close all
clear all
```

Part 1

```
A = readtable('housing.csv');


for i = 1:1:20640
    if strcmp(A.ocean_proximity(i), 'NEAR BAY')
        A.ocean_proximity(i) = strrep(A.ocean_proximity(i), 'NEAR
 BAY', '4');
    elseif strcmp(A.ocean_proximity(i), '<1H OCEAN')
        A.ocean_proximity(i) = strrep(A.ocean_proximity(i), '<1H
 OCEAN', '1');
    elseif strcmp(A.ocean_proximity(i), 'INLAND')
        A.ocean_proximity(i) =
 strrep(A.ocean_proximity(i), 'INLAND', '2');
    elseif strcmp(A.ocean_proximity(i), 'NEAR OCEAN')
        A.ocean_proximity(i) = strrep(A.ocean_proximity(i), 'NEAR
 OCEAN', '3');
    else
        A.ocean_proximity(i) =
 strrep(A.ocean_proximity(i), 'ISLAND', '5');
    end
%     str2double(A.ocean_proximity(i));
end


OPClass = A.ocean_proximity;
abc = cellfun(@str2num,OPClass);
B = table2array(A(:,1:9));

B = [B abc];

figure;
plotmatrix(B)


x1 = B(:,1);
```

```
x2 = B(:,2);
y = B(:,10);
figure;


for kk = 1:5
    scatter(x1(y == kk), x2(y == kk))
    hold on
end


legend('<1H Ocean', 'Inland', 'Near Ocean', 'Near Bay', 'Island')
xlabel('Latitude')
ylabel('Longitude')


%new data

x1new = [-117.59292, -122.99700, -122.47476, -118.10267, -119.85405,
 -118.32575];
x2new = [34.10626, 37.89909, 37.74269, 34.13808, 34.41536, 33.34261];


scatter(x1new,x2new,30, 'ko', 'filled','HandleVisibility','off')

hold off
```





knnsearch

```
X = [x1 x2];
Ynew = [x1new' x2new'];

[idx, eD] = knnsearch(X,Ynew,'K', 20);

house1idx = idx(1,:)';
house1x1 = x1(house1idx);
house1x2 = x2(house1idx);
house1y = y(house1idx);

house2idx = idx(2,:)';
house2x1 = x1(house2idx);
house2x2 = x2(house2idx);
house2y = y(house2idx);

house3idx = idx(3,:)';
house3x1 = x1(house3idx);
house3x2 = x2(house3idx);
house3y = y(house3idx);

house4idx = idx(4,:)';
house4x1 = x1(house4idx);
house4x2 = x2(house4idx);
```

```
house4y = y(house4idx);

house5idx = idx(5,:)';
house5x1 = x1(house5idx);
house5x2 = x2(house5idx);
house5y = y(house5idx);

house6idx = idx(6,:)';
house6x1 = x1(house6idx);
house6x2 = x2(house6idx);
house6y = y(house6idx);

houseclasstot = [mode(house1y) mode(house2y) mode(house3y)
 mode(house4y) mode(house5y) mode(house6y)];
%make into table for output
for jj = 1:6
    fprintf('New House #%d ',jj)
    fprintf('Classified as %d\n', houseclasstot(jj))
    disp('')
end


House1table=table(house1x1, house1x2, house1y, 'VariableNames',
 {'Longitude','Latitude', 'HousingClass'})
House2table=table(house2x1, house2x2, house2y, 'VariableNames',
 {'Longitude','Latitude', 'HousingClass'})
House3table=table(house3x1, house3x2, house3y, 'VariableNames',
 {'Longitude','Latitude', 'HousingClass'})
House4table=table(house4x1, house4x2, house4y, 'VariableNames',
 {'Longitude','Latitude', 'HousingClass'})
House5table=table(house5x1, house5x2, house5y, 'VariableNames',
 {'Longitude','Latitude', 'HousingClass'})
House6table=table(house6x1, house6x2, house6y, 'VariableNames',
 {'Longitude','Latitude', 'HousingClass'})

New House #1 Classified as 2
New House #2 Classified as 3
New House #3 Classified as 4
New House #4 Classified as 1
New House #5 Classified as 3
New House #6 Classified as 3

House1table =

  20×3 table

    Longitude    Latitude    HousingClass
    _________    ________    ____________

      -117.59       34.1           2
       -117.6      34.11           2
      -117.58      34.11           2
      -117.58       34.1           2
      -117.59      34.09           2
```

-117.61	34.1	2
-117.58	34.09	2
-117.61	34.12	2
-117.61	34.09	2
-117.61	34.09	2
-117.59	34.13	2
-117.6	34.08	2
-117.62	34.11	2
-117.62	34.11	2
-117.61	34.13	2
-117.61	34.08	2
-117.61	34.08	2
-117.62	34.09	2
-117.57	34.13	2
-117.56	34.12	2

House2table =

20×3 table

Longitude	Latitude	HousingClass
-122.93	38.02	3
-122.84	38.07	3
-122.86	38.1	3
-122.81	38.08	3
-122.71	37.9	3
-122.71	37.88	3
-122.69	37.91	3
-122.7	38.03	3
-122.68	38.01	3
-122.66	37.93	3
-122.8	38.18	3
-122.68	38.07	3
-122.64	37.96	3
-122.96	38.26	3
-122.65	38.01	3
-122.64	38.01	3
-122.64	38.01	3
-122.62	37.85	3
-122.62	37.97	3
-122.9	38.28	3

House3table =

20×3 table

Longitude	Latitude	HousingClass
-122.47	37.74	4

-122.47	37.74	4
-122.47	37.74	4
-122.47	37.74	4
-122.48	37.74	3
-122.48	37.74	3
-122.48	37.74	3
-122.48	37.74	3
-122.47	37.75	4
-122.47	37.75	4
-122.47	37.75	4
-122.47	37.75	4
-122.47	37.75	4
-122.47	37.75	4
-122.48	37.75	4
-122.48	37.75	4
-122.48	37.75	4
-122.48	37.75	4
-122.48	37.75	4
-122.47	37.73	3

House4table =

20×3 table

Longitude	Latitude	HousingClass
-118.1	34.14	1
-118.1	34.14	1
-118.11	34.14	1
-118.11	34.14	1
-118.1	34.13	1
-118.1	34.13	1
-118.1	34.13	1
-118.1	34.15	2
-118.1	34.15	2
-118.09	34.14	2
-118.11	34.15	1
-118.11	34.15	1
-118.09	34.15	2
-118.09	34.15	2
-118.09	34.15	2
-118.09	34.15	2
-118.12	34.14	1
-118.12	34.14	1
-118.1	34.12	1
-118.1	34.12	1

House5table =

20×3 table

Longitude	Latitude	HousingClass
-119.86	34.42	3
-119.86	34.41	3
-119.85	34.4	3
-119.85	34.44	3
-119.88	34.42	3
-119.83	34.43	3
-119.84	34.44	3
-119.88	34.43	3
-119.88	34.43	3
-119.88	34.43	3
-119.88	34.4	3
-119.83	34.44	3
-119.83	34.44	3
-119.88	34.44	3
-119.86	34.38	3
-119.86	34.38	3
-119.82	34.43	3
-119.84	34.45	3
-119.82	34.44	3
-119.82	34.44	3

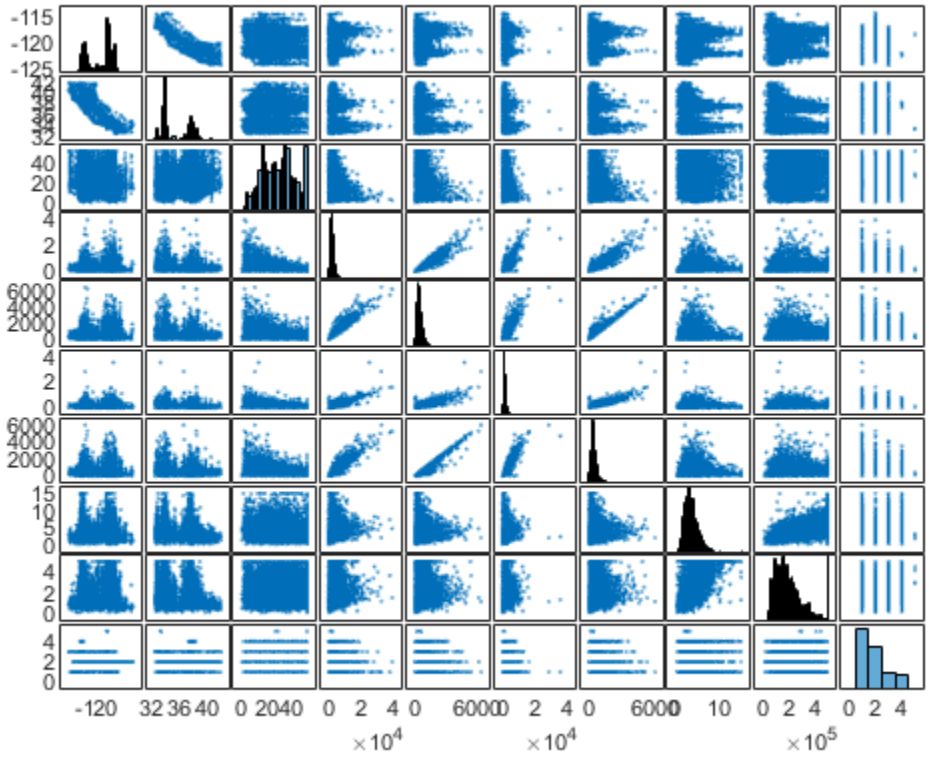
House6table =

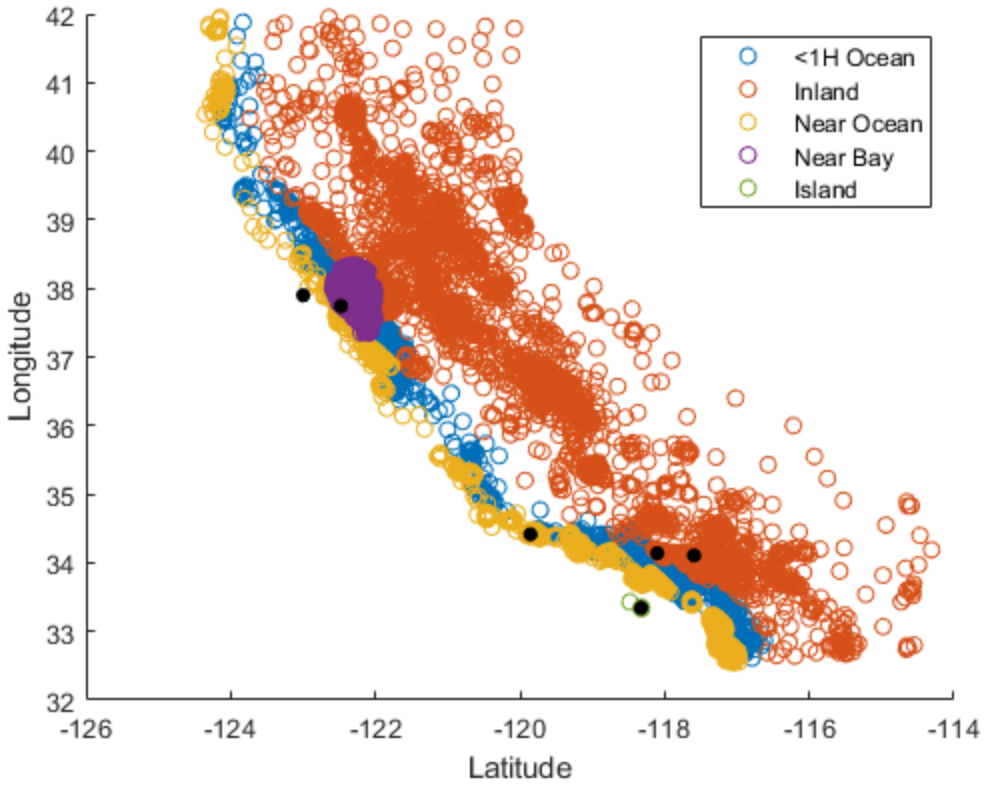
20×3 table

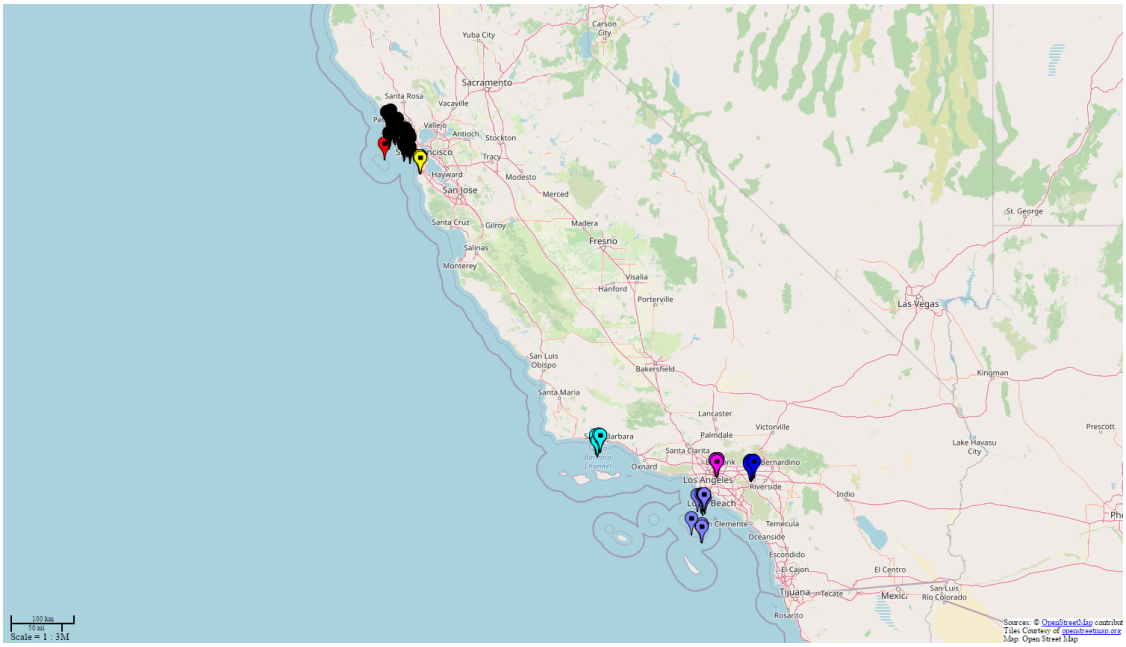
Longitude	Latitude	HousingClass
-118.33	33.34	5
-118.32	33.34	5
-118.32	33.35	5
-118.32	33.33	5
-118.48	33.43	5
-118.31	33.67	3
-118.28	33.68	3
-118.33	33.69	3
-118.29	33.71	3
-118.29	33.71	3
-118.29	33.71	3
-118.29	33.71	3
-118.39	33.71	3
-118.33	33.72	3
-118.31	33.72	3
-118.3	33.72	3
-118.3	33.72	3
-118.3	33.72	3
-118.29	33.72	3
-118.29	33.72	3

Webmap

```
wm = webmap('Open Street Map');
newhouses = geopoint(x2new, x1new);
webmarker_nh = wmmarker(newhouses, 'Color', 'red');

h1 = geopoint(house1x2, house1x1);
h2 = geopoint(house2x2, house2x1);
h3 = geopoint(house3x2, house3x1);
h4 = geopoint(house4x2, house4x1);
h5 = geopoint(house5x2, house5x1);
h6 = geopoint(house6x2, house6x1);

wmmarker(h1, 'Color', 'b');
wmmarker(h2, 'Color', 'k');
wmmarker(h3, 'Color', 'y');
wmmarker(h4, 'Color', 'm');
wmmarker(h5, 'Color', 'c');
wmmarker(h6, 'Color', [0.5 0.5 1]);
```







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