

# Problem Set #3

## About the data

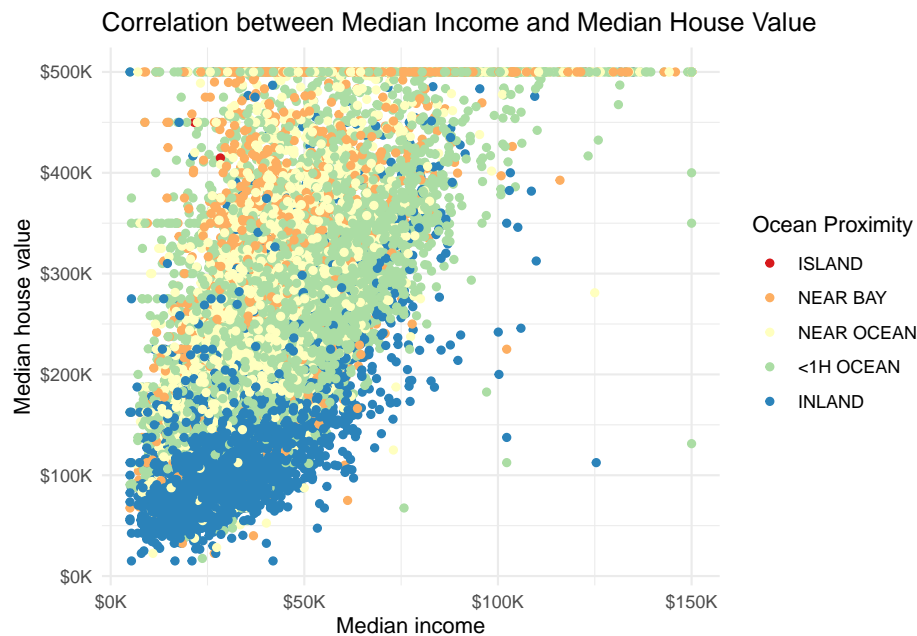
The data (Pace & Barry, 1997) contains information from the 1990 California census. Pace & Barry (1997) includes the following variables: longitude, latitude, housing\_median\_age, total\_rooms, total\_bedrooms, population, households, median\_income, median\_house\_value, ocean\_proximity .

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## [1] "housing.RDS"
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longitude	latitude	housing_median_age	total_rooms	total_bedrooms	population	households	median_income	median_house_value	ocean_proximity
-122.23	37.88	41	880	129	322	126	8.3252	452600	NEAR BAY
-122.22	37.86	21	7099	1106	2401	1138	8.3014	358500	NEAR BAY
-122.24	37.85	52	1467	190	496	177	7.2574	352100	NEAR BAY
-122.25	37.85	52	1274	235	558	219	5.6431	341300	NEAR BAY
-122.25	37.85	52	1627	280	565	259	3.8462	342200	NEAR BAY
-122.25	37.85	52	919	213	413	193	4.0368	269700	NEAR BAY
-122.25	37.84	52	2535	489	1094	514	3.6591	299200	NEAR BAY
-122.25	37.84	52	3104	687	1157	647	3.1200	241400	NEAR BAY
-122.26	37.84	42	2555	665	1206	595	2.0804	226700	NEAR BAY
-122.25	37.84	52	3549	707	1551	714	3.6912	261100	NEAR BAY

## Data analysis

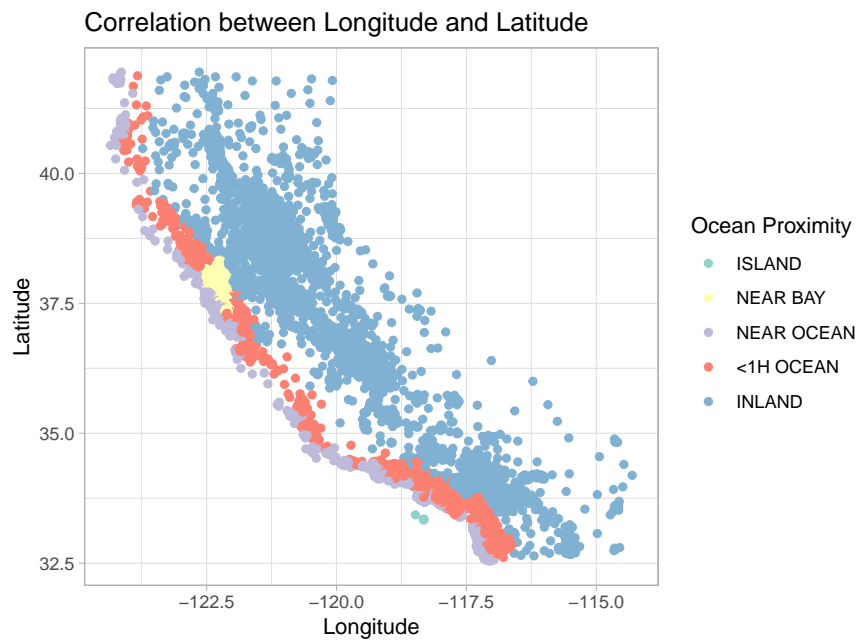
There is positive correlation between median income and median house value. Houses near bay or ocean have greater rate of change than inland houses.



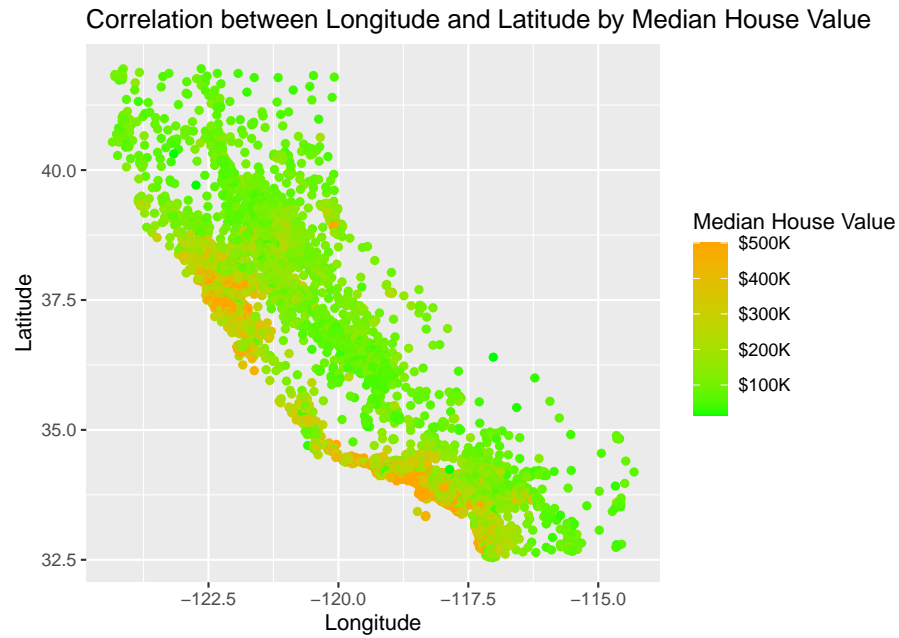
There is positive correlation between median income and median house value. Inland houses have the smallest rate of change. There are limited island houses in this sample.



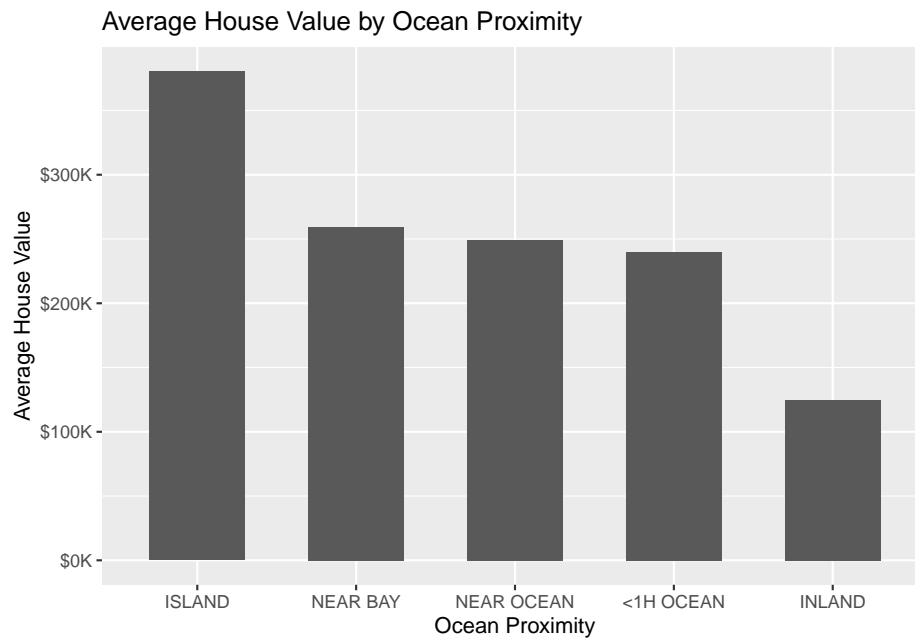
This map shows a vague shape of the California landscape. There is a negative correlation between the longitude and latitude.



If the houses are in the same longitude, the lower the latitude, the higher the median house value.



The average house value of island houses is more than 3 times higher than inland house, while houses near bay has slightly higher average house values than houses near ocean.



## References

Pace, Kelley R., & Barry, R. (1997). Sparse spatial autoregressions. *Statistics and Probability Letters*, 33(3), 291–297.