Predictive Modelling with Python

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Contents

Software installation

Regression

Data preparation, Visualization, Modelling, Feature selection, Evaluation

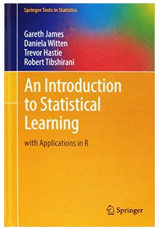
Classification

Data preparation, Visualization, Modelling, Feature selection, Evaluation

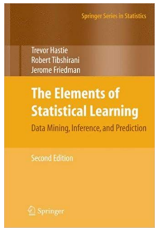
Installation

Install conda

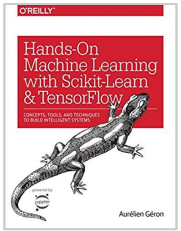
Readings



James, G., Witten, D., Hastie, T., & Tibshirani, R. (2013). ***An introduction to statistical learning*** (Vol. 6). New York: Springer.

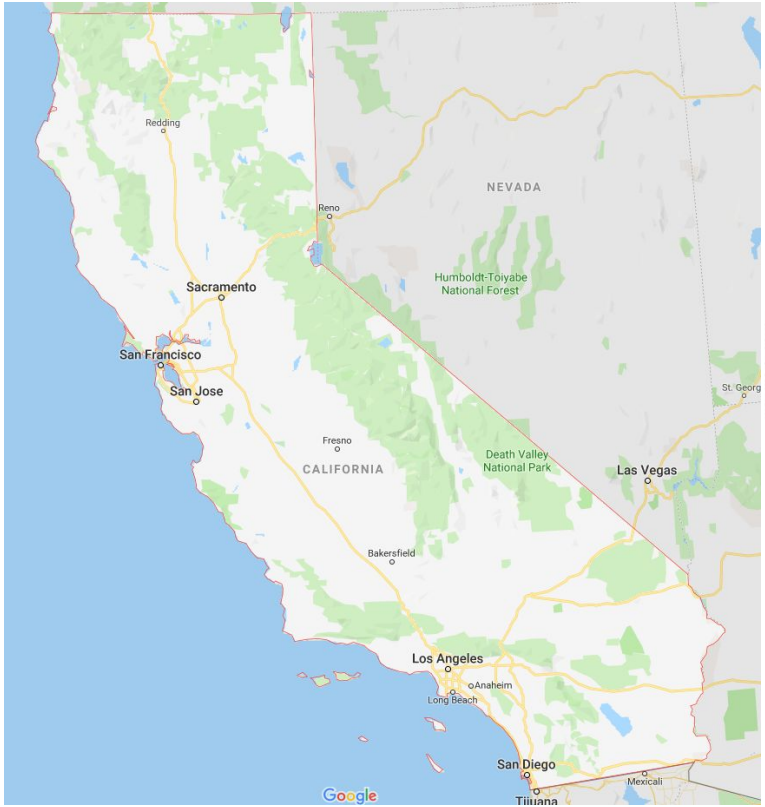


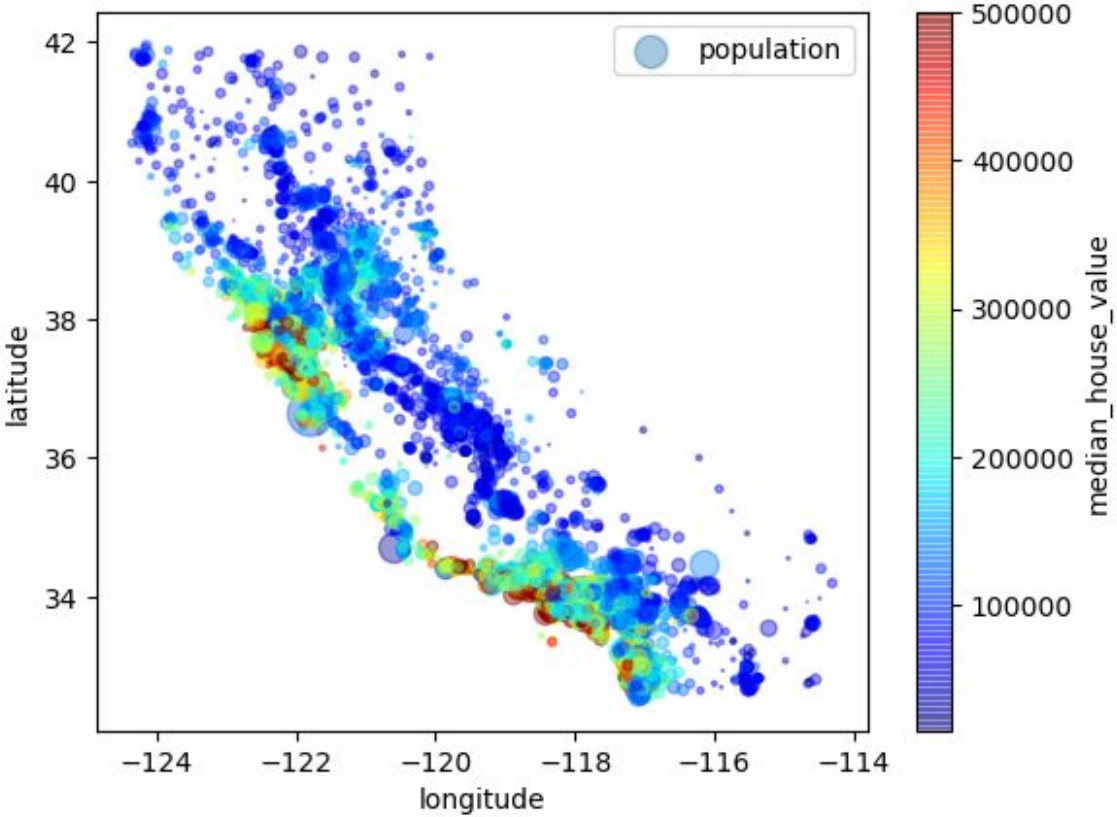
Friedman, J., Hastie, T., & Tibshirani, R. (2009). ***The Elements of Statistical Learning: Data Mining, Inference, and Prediction***. Springer Series in Statistics.



Geron, A. (2017). ***Hands-on machine learning with Scikit-Learn and TensorFlow***. O'Reilly. *(there's also the 2nd edition of this book)*

California housing





Does **more money**

make **people happier?**

Classification

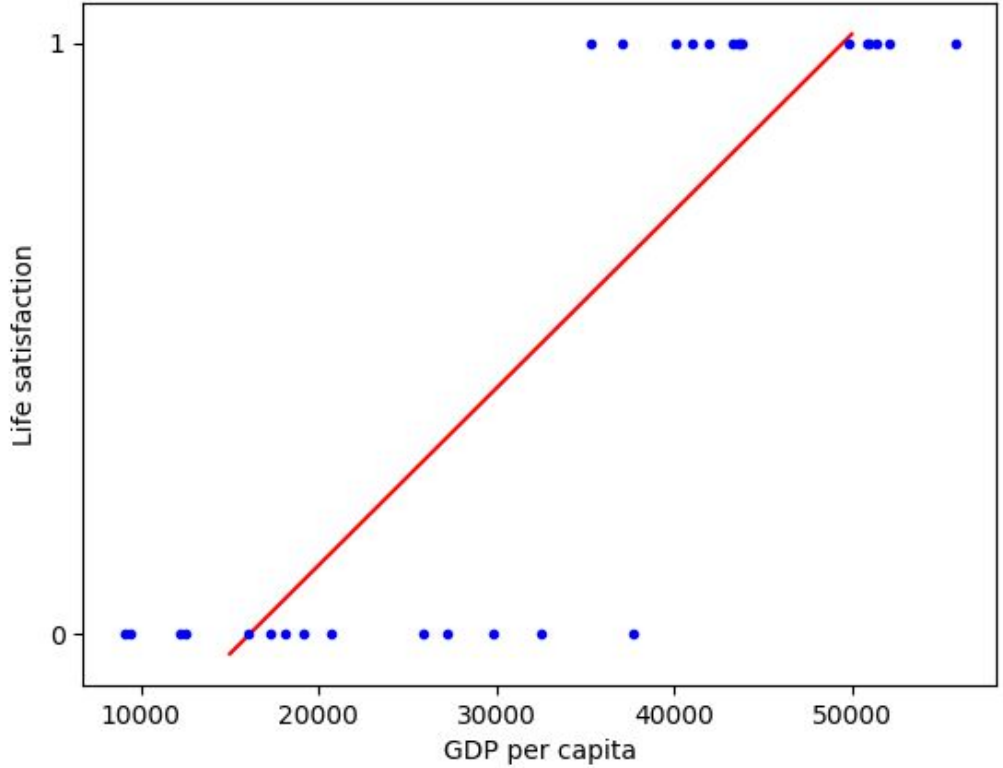
k Nearest Neighbour Classification

Logistic Regression

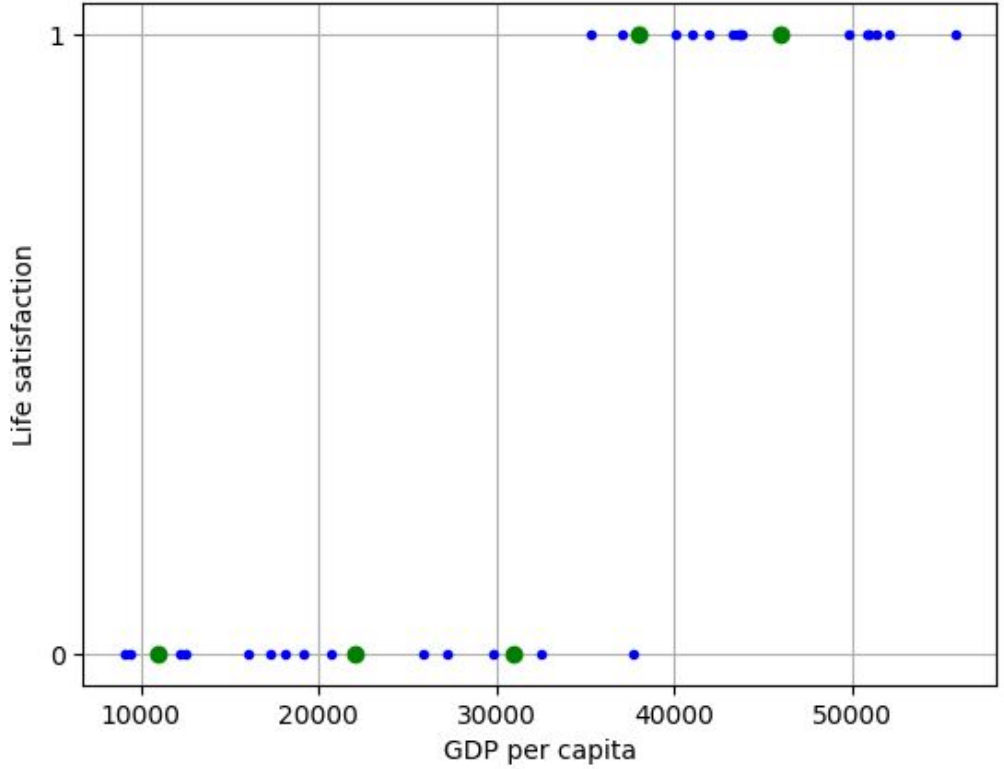
Classification Trees

Random Forest

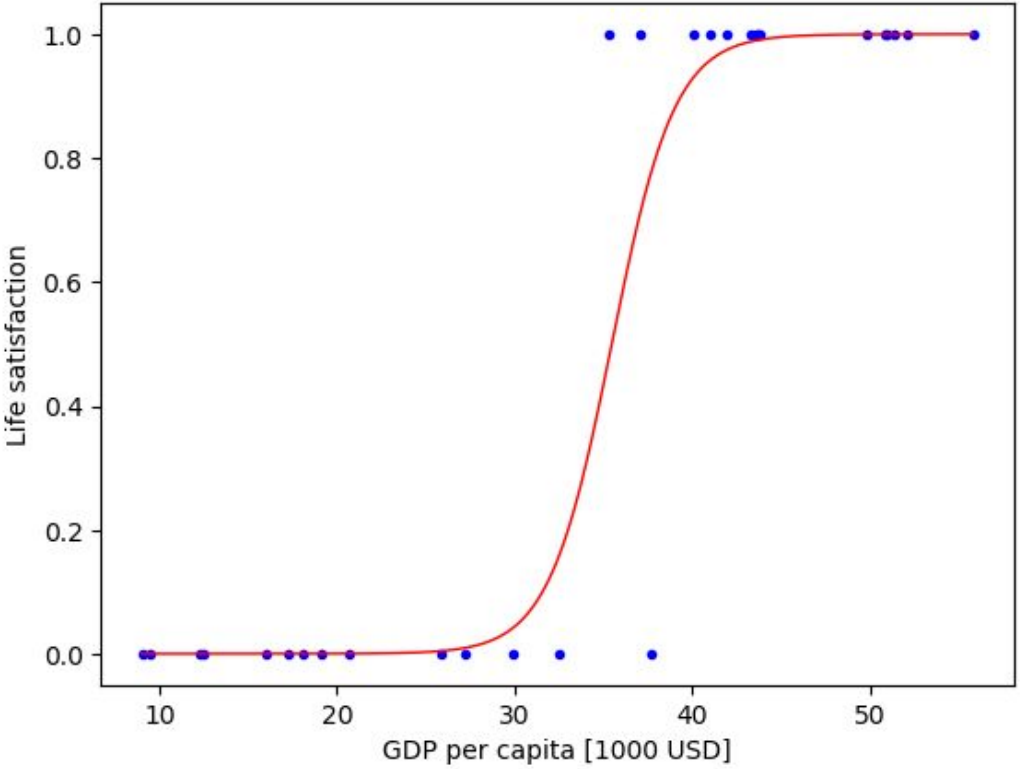
Life satisfaction linear regression



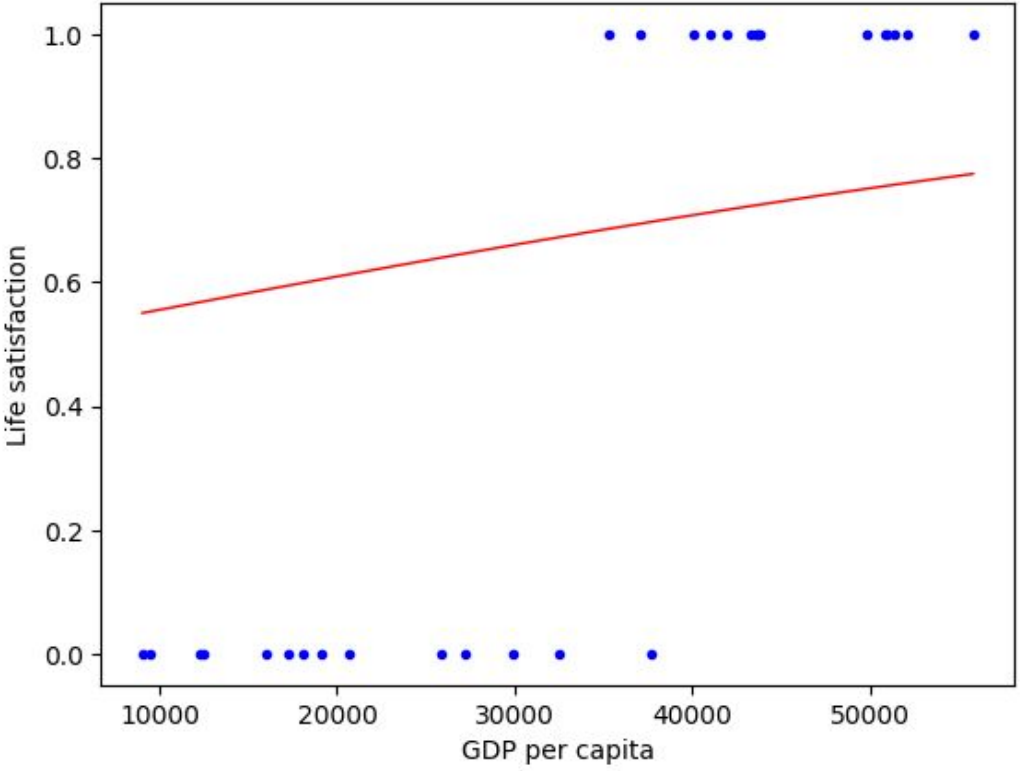
Life satisfaction kNN Classification



Life satisfaction **Logistic Regression**



Logistic Regression **Problems**



Evaluation

		Predicted	
		Negative	**Positive**
Actual	**Negative**	True Negatives (TN)	False Positives (FP)
	Positive	False Negatives (FN)	True Positives (TP)

$$\text{precision} = \frac{TP}{TP + FP}$$

$$\text{recall} = \frac{TP}{TP + FN}$$

$$F_1 = \frac{2}{\frac{1}{\text{precision}} + \frac{1}{\text{recall}}} = 2 \times \frac{\text{precision} \times \text{recall}}{\text{precision} + \text{recall}} = \frac{TP}{TP + \frac{FN + FP}{2}}$$