**Husköp**

**Perhaps my strategy will be to build a multiple linear regression/elastic net model with several predictors (and all interactions of predictors) to build an equation that predicts the price of an apartment +/- a 95% CI. Then, a second step, will be to plug in the data for a current apartment that is for sale and see if the high end of the CI is within my budget. Finally, start bidding at the low end of the CI, and stop bidding at the high end.**

**Harvested predictors:**

Statistikdatabasen:

Sold multi-dwelling buildings by month

Sold multi-dwelling buildings by quarter

Sold multi-dwelling buildings by region and year

Sold tenant-owned flats Stockholm by year

Trafiklab:

Distance to public transport

Maklarstatistik:

Prices for bostadsrätter by year in:

Central Stockholm vs Spånga/Kista vs Bromma/Vesterled

Danderyd vs Lidingö vs Järfälla

Essingen vs Kungsholmen vs Hasselby/Vällingby

Sollentuna vs Solna vs Sundbyberg

Vasastan vs Södermalm vs Östermalm

Prices for bostadsrätter by month in last 48 months in:

Central Stockholm vs Spånga/Kista vs Bromma/Vesterled

Danderyd vs Lidingö vs Järfälla

Essingen vs Kungsholmen vs Hasselby/Vällingby

Sollentuna vs Solna vs Sundbyberg

Vasastan vs Södermalm vs Östermalm

Prices per kvm and price development for bostadsrätter in Stockholm areas last 3 months and last 12 months

**Model choices**:

**Supervised:**

Linear regression - one dimension predicts output on a continuous variable

Multiple linear regression - multiple dimensions predict output on a continuous variable

Logistic Regression - one/multiple dimensions predict output on a binary variable

**Diff to multiple linear just in output of continuous vs binary? Why not always use multiple? Some people argue that you should. Others not.** The assumptions are not identical for the two approaches, but generally the outputs are about the same.

Notes about logistic: can only do two classes at a time, so if more than 2 exist, must do multiple comparisons or one class vs. probability of any of other classes

Softmax Regression - generalized logistic regression, returns probability of belonging to any number of multiple classes

K-Nearest Neighbors - one/multiple dimensions predict output on categorical variable

**Diff to NB?** Must optimize K. Tends to overfit. Not great with outliers since fits locally. Apparently not great at prediction. Not great with multiple dimensions, and thus PCA or other dimensional-reduction (SVD?) is needed first or else compute times get unwieldy. KNN also weighs all predictor dimensions equally. Also, KNN cannot handle missing data, so it must be imputed. Output of KNN is a classification.

Naive Bayes’ Classifier - one/multiple dimensions predict output on categorical variable

**Diff to KNN?** Apparently faster and self-improving. However, KNN boundaries can be of any shape, whereas in NB, they must be linear, elliptic, or parabolic. NB also does not do as well when predictor dimensions are correlated. NB algorithms also need to be adjusted if there are null/0 cases (e.g., a spam-filter may see “password” in spam email, but there may be 0 cases of the word in the training data for non-spam email). Output of NB is a classification and a probability.

Presumes features are 100% independent from one another - Uses log probabilities to reduce the chance of floating point errors when multiplying very small numbers repeatedly, but this means you often have to inject a base-line value for features that rarely appear or else they may get log(0) which is undefined

Decision Tree / Random Forest - one/multiple dimensions predict output on categorical variable

**Diff to KNN and NB?** In KNN, input data must be numeric to calculate distances to neighbors. In a decision tree, input/predictor dimensions can be categorical. Output is a classification, whereas in NB the output is a probability of an outcome. Decision trees tend to need more input data than NB to start getting useful results. Decision trees tend to overfit (but using random forests can adjust the problem). For Decision trees, the data probably does not need preprocessing.

Piecewise Constant Model

Learning Regression Trees

CART (Classification and Regression Tree) Decision Tree

C 4.5

Support Vector Classifier (SVC)  
Support Vector Machine (SVM) - discriminates between two classes by trying to draw a hyperplane that is one dimension less than the input data and maximizing the distance between the points and that hyperplane by creating support vectors on either side of the hyperplane (hard condition) or minimizing the cost of points that fall within the space defined by the support vectors (softmargin hyperplane using hingeloss function)) - input data are often (if not always) enriched with new features by kernel functions that add dimensionality and may make drawing discriminatory hyperplanes + support vectors easier - kernel functions include linear, polynomial, and radial basis functions (rbfs)

Perceptron

**Do not really understand this one…** Basically, a single perceptron draws a straight line through 2-d space to separate points. Not very interesting usually, and dominated by KNN since KNN can deal with groups that are not linearly-separable in 2-d space. However, by adding more perceptrons, you get combinations of lines in the 2-d space as your output, which can effectively separate groups in 2-d space that are not linearly separable. Adding ‘layers’ between input and output (the output of one perceptron/group of perceptrons becomes input into the next perceptron/group of perceptrons) results in even more useful separation of groups in 2-d or higher-dimensional space.

**Unsupervised:**

K-Means Clustering- take multiple dimensions of data and predicts how cases should be grouped into catagories

**Måste ha:**

Villa, radhus, bostadsrätt

Dölj nyproduktion

2 500 000 SEK max pris

6000 SEK max avgift

Driftkostnader under 20 000 SEK

Föreningens ekonomi, <9 000 SEK per kvm, ideally <5 000 SEK per kvm

**Larger but farther away:**

Lidingö, Danderyds, Järfalla, Sollentuna, Solna, Stockholms kommuner

80 kvm min Boarea

4 rum

[**https://tinyurl.com/DGL-huskop**](https://tinyurl.com/DGL-huskop)

**Smaller but closer:**

Kungsholmen, Vasastan, Östermalm, Gamla Stan, Södermalm

2 rum

[**https://tinyurl.com/DGL-hus-small-close**](https://tinyurl.com/DGL-hus-small-close)

**Nice to have:**

Tvätt maskin kopplingen

Besiktningsman från Svenska Byggingenjörers Riksförbund (sbr)

**Vill ha:**

En gård med bambu som staket

Bifogat studiolägenhet med egen kök, toa samt sovrum

**Sites to search:**

Hemnet ([API here](https://api-portal.hemnet.se/), but pnly for mäklare)

Booli.se/slutpriser ([API here](https://www.booli.se/p/api/), reached out to them, but do not expect to get a response)

[Site owned by Booli to find real-estate agents](https://www.hittamaklare.se/maklare/stockholms-lan?utm_source=booli&utm_medium=arealist&utm_content=Stockholms%20l%c3%a4n&utm_campaign=search)

Blocket

Hittahem

Bovision

**Råd:**

<https://www.expressen.se/leva-och-bo/8-viktiga-saker-att-tanka-pa-nar-du-ska-kopa-hus/>

<https://www.svenskfast.se/guider/driftkostnad/>

**Att göra Airbnb:**

cyklar

tvättmaskin

typisk svensk vegetarisk mat

svenskt öl och sprit

Håkan has purchased several homes, may have opinions

Nico and Cécile have purchased a home and have ideas

Petter has purchased and may have an opinion

Petter has a friend that may look at the BRF documents to evaluate the economy of the place

Residence ideas

[Homesteading in Sweden](http://www.alternativ.nu/index.php?PHPSESSID=efb721dd70035a3c7335bc3eaec4fadf;wwwRedirect)

Another idea… Buy a van or small RV in order to live in that and travel?

A couple of sites related to this are [here](https://wandrlymagazine.com/save-money-by-traveling/) and [here](https://axleaddict.com/rvs/Guide-To-Understanding-the-Real-Cost-of-RV-Ownership) and [here](http://heathandalyssa.com/cost-to-live-in-an-rv/)

[Wikihouse](https://wikihouse.cc/)… a site with blueprints for building houses with a CNC machine

Houseboat- look [here](http://www.all-about-houseboats.com/monthly-houseboat-budget-the-costs-to-run-own-or-operate-house-boats.html) or [here](http://mymoneywizard.com/cost-of-living-on-a-houseboat/), some for sale [here](https://www.boat24.com/se/)

Tiny houses- [here](https://www.fourlightshouses.com/) and [here](https://www.tumbleweedhouses.com/tiny-houses-for-sale/) and [here](https://tinyhouselistings.com/)

Electric RV?

Dreamhouse:

* Minimizes use of public infrastructure through:
  + Geothermal heating
  + Solar panels for power generation
  + Hydropower if near running water
  + Rain collection
  + Ecotoilets
* Attached studio or 1-bedroom apartment with own restroom for AirBnB, long-term rentals, visitors
* At least 2-bedrooms, 1 bathroom, laundry room, kitchen with island connected to dining room which also blends into living room
* Built into a greenhouse so as to enclose:
  + House (protected from weather, thus will last longer between repairs)
  + Outdoor gym
  + Garden

To have in home:

* Cactus
* Bamboo
* Functional furniture (fold-away bed, high efficiency use of space, etc)
* Bamboo dishes (Småland store)
* Cast iron pots and pans and Dutch oven
* Wood dishes