Review report of a final thesis

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Thesis title:	Application of Machine Learning in Real Estate
Branch / specialization:	Knowledge Engineering
Created on:	6 June 2022

Evaluation criteria

1. Fulfillment of the assignment

[1] assignment fulfilled
▸ [2] **assignment fulfilled with minor objections**
[3] assignment fulfilled with major objections
[4] assignment not fulfilled

One of the goals of the thesis was to map state of the art applications of machine learning in the real estate domain. It is not clear if Chapter 2 is meant to fulfill this goal and how the two presented theses and two papers were selected to be presented there.

On the other hand, beyond the scope of the thesis, an interesting experiment on how features manually extracted from listing images affect the prediction of a rent price was designed and conducted.

2. Main written part   80 / 100 (B)

The thesis focuses on reporting progress and results of a decent data science project in the domain of real estate rent price prediction. However, to assess the results properly, two estimations/evaluations are missing in the written part:
1) How is the site selected as a data source relevant to overall local real estate market? What portion of the number of listings is from the selected site? Is the structure of the listings there similar to overall structure of the real estate market?
2) How did the reported prediction scores relate to real/predicted listings prices and their characteristics like variance? Did the model introduce a significant bias or was its prediction error within the margins of noise in the data?

The text is concise and most of the time easy to follow. Minor typos are present.

Part of bibliographical references is not presented correctly, e.g. [2] and [5].

3. Non-written part, attachments 90 /100 (A)

Data gathering tasks of non-written part consisted of scraping real estate listings from the selected site and manually extracting features from 100 listing images.
The experimental part of the work was to perform the modelling workflow, i.e. cleaning data, explanatory data analysis and training a predictor, on tabular data.

Both parts were conducted in acceptable form using suitable tools. All experiments are reproducible.

4. Evaluation of results, publication outputs and awards 80 /100 (B)

When performance limits given by the source data are estimated and prediction scores are put into context, results could support a quick assessment of a rent price for a real estate property in a local context.
Also, demonstration of how features extracted from images affect the performance of price predictors is most likely new in a local context.

The overall evaluation 85 /100 (B)

The student demonstrated the skill to execute a standard data science workflow in a selected domain on a decent level. There are some issues with the written work summarized above.

Questions for the defense

1. What fraction of actual price prediction is reported error of models? Would you say a model with such error would be usable for someone trying to set a proper lease price for a real estate listing?
2. How did you select theses and papers presented in Chapter 2?
3. Most of the listings in your dataset are from Prague. How would the models perform when trained only on Prague or outside Prague data?

Instructions

Fulfillment of the assignment

Assess whether the submitted FT defines the objectives sufficiently and in line with the assignment; whether the objectives are formulated correctly and fulfilled sufficiently. In the comment, specify the points of the assignment that have not been met, assess the severity, impact, and, if appropriate, also the cause of the deficiencies. If the assignment differs substantially from the standards for the FT or if the student has developed the FT beyond the assignment, describe the way it got reflected on the quality of the assignment's fulfilment and the way it affected your final evaluation.

Main written part

Evaluate whether the extent of the FT is adequate to its content and scope: are all the parts of the FT contentful and necessary? Next, consider whether the submitted FT is actually correct – are there factual errors or inaccuracies?

Evaluate the logical structure of the FT, the thematic flow between chapters and whether the text is comprehensible to the reader. Assess whether the formal notations in the FT are used correctly. Assess the typographic and language aspects of the FT, follow the Dean's Directive No. 52/2021, Art. 3.

Evaluate whether the relevant sources are properly used, quoted and cited. Verify that all quotes are properly distinguished from the results achieved in the FT, thus, that the citation ethics has not been violated and that the citations are complete and in accordance with citation practices and standards. Finally, evaluate whether the software and other copyrighted works have been used in accordance with their license terms.

Non-written part, attachments

Depending on the nature of the FT, comment on the non-written part of the thesis. For example: SW work – the overall quality of the program. Is the technology used (from the development to deployment) suitable and adequate? HW – functional sample. Evaluate the technology and tools used. Research and experimental work – repeatability of the experiment.

Evaluation of results, publication outputs and awards

Depending on the nature of the thesis, estimate whether the thesis results could be deployed in practice; alternatively, evaluate whether the results of the FT extend the already published/known results or whether they bring in completely new findings.

The overall evaluation

Summarize which of the aspects of the FT affected your grading process the most. The overall grade does not need to be an arithmetic mean (or other value) calculated from the evaluation in the previous criteria. Generally, a well-fulfilled assignment is assessed by grade A.