

Visualization Term Project

20141087 Ryeongyang Kim 20161206 Jaewoong Lee

November 22, 2019

Contents

1	Introduction	3
2	Materials	3
2.1	Building Layout	3
2.1.1	Basic	3
3	Methods	3
3.1	Scikit-learn: Machine Learning in Python	3
3.2	Matplotlib	4
3.3	Pandas	4
3.4	SciPy	4
4	Results	4
4.1	Question 1	4
4.1.1	Fixed prox data	4
4.1.2	Mobile prox data	4
4.2	Question 2	4
4.3	Question 3	4
4.4	Question 4	4
5	Discussion	4

List of Tables

List of Figures

1	Main Layout of the building	3
2	Energy Zone of the Building	3
3	Prox zone of the Building	3

1 Introduction

2 Materials

2.1 Building Layout

2.1.1 Basic

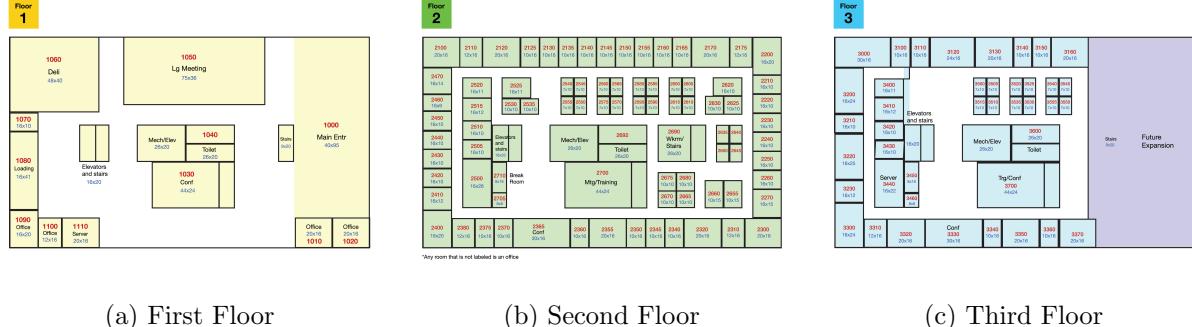


Figure 1: Main Layout of the building

The main layout of this building is as figure 1.

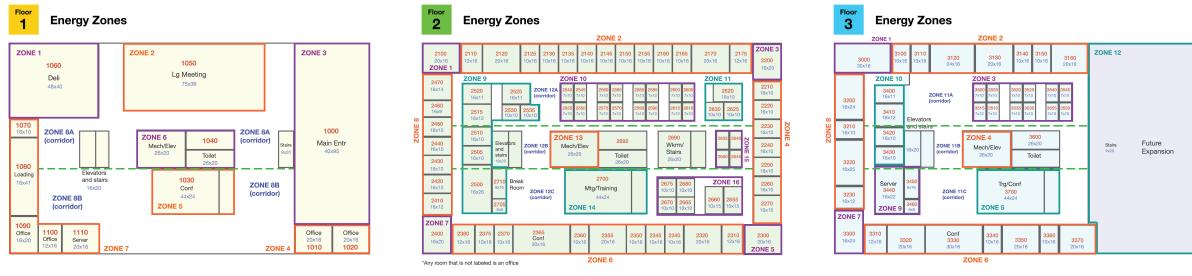


Figure 2: Energy Zone of the Building

The energy zone of this building is as figure 2.

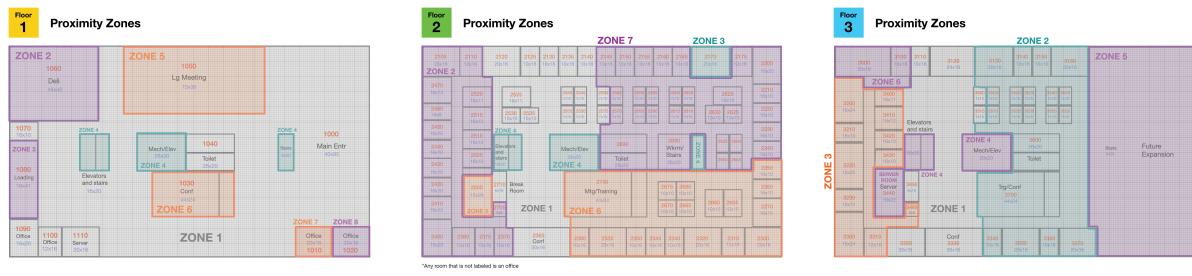


Figure 3: Prox zone of the Building

The prox zone of this building is as figure 3.

3 Methods

3.1 Scikit-learn: Machine Learning in Python

Scikit-learn is a Python module integrating a wide range of state-of-the-art machine learning algorithms for medium-scale supervised and unsupervised problems. [1]

3.2 Matplotlib

Matplotlib is a Python 2D plotting library which produces publication quality figures in a variety of hardcopy formats and interactive environments across platforms. [2]

3.3 Pandas

Pandas is a Python library of rich data structures and tools for working with structured data sets common to statistic, finance, social sciences, and many other fields. [3]

3.4 SciPy

SciPy is a Python-based ecosystem of open-source software for mathematics, science, and engineering.

4 Results

- 4.1 What are the typical patterns in the prox card data? What does a typical day look like for GASTech employees? Describe up to five of the most interesting patterns that appear in the building data.
 - 4.1.1 Fixed prox data
 - 4.1.2 Mobile prox data
- 4.2 Describe up to five of the most interesting patterns that appear in the building data. Describe what is notable about the pattern and explain its possible significance.
- 4.3 Describe up to five notable anomalies or unusual events you see in the data. Prioritize those issue that are most likely to represent a danger or a serious issue for building operations.
- 4.4 Describe up to three observed relationships between the proximity card data and building data elements. If you find a causal relationship, describe your discovered cause and effect, the evidence you found the support it, and your level of confidence in your assessment of the relationship.

5 Discussion

References

- [1] F. Pedregosa, G. Varoquaux, A. Gramfort, V. Michel, B. Thirion, O. Grisel, M. Blondel, P. Prettenhofer, R. Weiss, V. Dubourg, *et al.*, “Scikit-learn: Machine learning in python,” *Journal of machine learning research*, vol. 12, no. Oct, pp. 2825–2830, 2011.
- [2] J. D. Hunter, “Matplotlib: A 2d graphics environment,” *Computing in science & engineering*, vol. 9, no. 3, p. 90, 2007.
- [3] W. McKinney, “pandas: a foundational python library for data analysis and statistics,” *Python for High Performance and Scientific Computing*, vol. 14, 2011.