# Do we need more bikes?
# Project in Statistical Machine Learning

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## Abstract

This is an abstract to summarize the problem and your findings. Number of group member: **K**

## 1 Problem Description

Ca

In this Project, we aim to analyze whether the increase in the number of bikes is necessary or not based on the various temporal and meteorogical data provided in the dataset.

## 2 Data Analysis

All headings should use lowercase letters, except for the first word and proper nouns. In the initial submission, include `\usepackage{neurips_2024}`; for the final submission, use `\usepackage[final]{neurips_2024}` and comment out `\usepackage{neurips_2024}`.

## 3 Model Development

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## 4 Conclusion

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### 4.1 Example of Figures

As shown in Figure 1 and Figure 2a...

### 4.2 Example of tables

According to Table **??**, we found that...

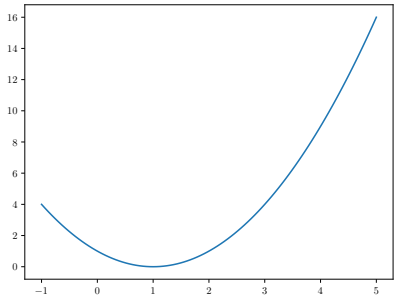
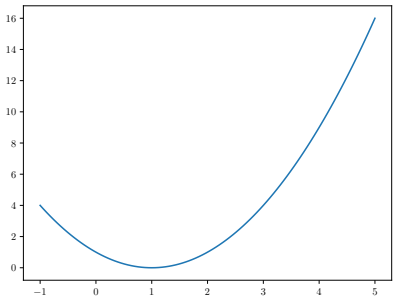
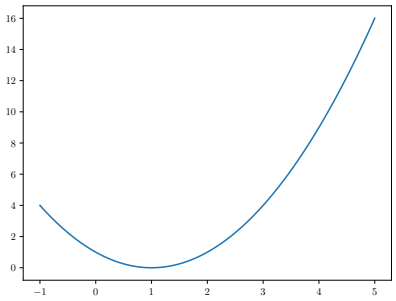


Figure 1: Sample figure caption.



(a) Caption about (a)



(b) Caption about (b)

Figure 2: Sample two figures

Table 1: Features in the Dataset

| **Feature** | **Type** | **Description** |
|---|---|---|
| hour_of_day | Ordinal | Hour of the day (0-23) |
| day_of_week | Ordinal | Day of the week (0-6) |
| month | Ordinal | Month of the year (1-12) |
| holiday | Binary / Categorical | Whether the day is a holiday or not (0 or 1) |
| weekday | Binary / Categorical | Whether the day is a weekday or not (0 or 1) |
| summertime | Binary / Categorical | Whether the day is in the summer time period or not (0 or 1) |
| temp | Numerical | Temperature in Celsius |
| dew | Numerical | Dew point temperature in Celsius |
| humidity | Numerical | Relative Humidity in percentage |
| precip | Numerical | Precipitation in mm |
| snow | Numerical | Amount of snow in the last hour in cm |
| snow_depth | Numerical | Accumulated snow depth in cm |
| windspeed | Numerical | Wind speed in km/h |
| cloudcover | Numerical | Percentage of cloud cover |
| visibility | Numerical | Distance in km at which objects or landmarks can be clearly seen and identified |
| increase_stock | Binary / Categorical (Target) | Whether an increase in bike stock is needed (0 or 1) |

### 4.3 Example of maths

Note that display math in bare TeX commands will not create correct line numbers for submission. Please use LaTeX (or AMSTeX) commands for unnumbered display math. (You

really shouldn't be using $$ anyway; see `https://tex.stackexchange.com/questions/503/why-is-preferable-to` and `https://tex.stackexchange.com/questions/40492/what-are-the-differences-between-align-equation-and-displaymath` for more information.)

$$\theta^* = (\mathbf{X}^\top \mathbf{X})^{-1} \mathbf{X}^\top \mathbf{Y} \tag{1}$$

The equation 1 ...

### 4.4 Example of citations

Any citation style is acceptable as long as you maintain consistency throughout. References should be included in the file "ref.bib." You may use author-year or numeric citation styles. To cite works in the author-year format, use the command `\citet`:

Hasselmo et al. [2]

For numeric citations, use the command `\cite`:

[1]

The `natbib` package will be automatically loaded for you.

For additional information, you can refer to the `natbib` documentation at:

`http://mirrors.ctan.org/macros/latex/contrib/natbib/natnotes.pdf`

## References


[1] J. M. Bower and D. Beeman. *The book of GENESIS: exploring realistic neural models with the GEneral NEural SImulation System*. Springer Science & Business Media, 2012.

[2] M. E. Hasselmo, E. Schnell, and E. Barkai. Dynamics of learning and recall at excitatory recurrent synapses and cholinergic modulation in rat hippocampal region ca3. *Journal of Neuroscience*, 15 (7):5249–5262, 1995.


## A Appendix

```python
import numpy as np
import pandas as pd

data = pd.read_csv("xxxxx.csv")
data.head()
```