

The Models of London Bike Sharing Prediction

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Authors

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Grainger College of Engineering, University of Illinois at Urbana-Champaign, Civil Engineering - Construction Management

- **Jane Roe**

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Department of Something, University of Whatever; Department of Whatever, University of Something

Abstract

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Introduction

Bold text

Semi-bold text

Centered text

Right-aligned text

Italic text

Combined *italics* and **bold**

~~Strikethrough~~

1. Ordered list item
2. Ordered list item
 - a. Sub-item
 - b. Sub-item
 - i. Sub-sub-item
3. Ordered list item
 - a. Sub-item

- List item
- List item
- List item

subscript: H₂O is a liquid

superscript: 2¹⁰ is 1024.

[unicode superscripts](#)⁰¹²³⁴⁵⁶⁷⁸⁹

[unicode subscripts](#)₀₁₂₃₄₅₆₇₈₉

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Putting each sentence on its own line has numerous benefits with regard to [editing](#) and [version control](#).

Line break without starting a new paragraph by putting two spaces at end of line.

Heading 3

Heading 4

Heading 5

Heading 6

A heading centered on its own printed page

Horizontal rule:

Heading 2's are recommended for broad sections such as *Abstract*, *Methods*, *Conclusion*, etc.

Heading 3's and Heading 4's are recommended for sub-sections.

Links

Bare URL link: <https://manubot.org>

[Long link with lots of words and stuff and junk and bleep and blah and stuff and other stuff and more stuff.yeah](#)

[Link with text](#)

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Citations

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Referencing figures, tables, equations

Figure [21](#)

Figure [22](#)

Figure [23](#)

Figure [24](#)

Table [16](#)

Equation [11](#)

Equation [12](#)

Quotes and code

Quoted text

Quoted block of text

Two roads diverged in a wood, and I—
I took the one less traveled by,
And that has made all the difference.

Code `in the middle` of normal text, aka `inline code`.

Code block with Python syntax highlighting:

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        konstruktsiyah"
```

Code block with no syntax highlighting:

```
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Exporting DOCX manuscript
Exporting PDF manuscript
```

Figures



Figure 1: A square image at actual size and with a bottom caption. Loaded from the latest version of image on GitHub.



Figure 2: An image too wide to fit within page at full size. Loaded from a specific (hashed) version of the image on GitHub.



Figure 3: A tall image with a specified height. Loaded from a specific (hashed) version of the image on GitHub.



Figure 4: A vector `.svg` image loaded from GitHub. The parameter `sanitize=true` is necessary to properly load SVGs hosted via GitHub URLs. White background specified to serve as a backdrop for transparent sections of the image.

Tables

Table 1: A table with a top caption and specified relative column widths.

<i>Bowling Scores</i>	Jane	John	Alice	Bob
Game 1	150	187	210	105
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Table 3: A table with merged cells using the `attributes` plugin.

	Colors	
Size	Text Color	Background Color
big	blue	orange
small	black	white

Equations

A LaTeX equation:

$$\int_0^\infty e^{-x^2} dx = \frac{\sqrt{\pi}}{2} \tag{1}$$

An equation too long to fit within page:

$$x = a + b + c + d + e + f + g + h + i + j + k + l + m + n + o + p + q + r + s + t + u + v + w + x + y + z + 1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9 \tag{2}$$

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Table 6: A table with merged cells using the `attributes` plugin.

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Figures

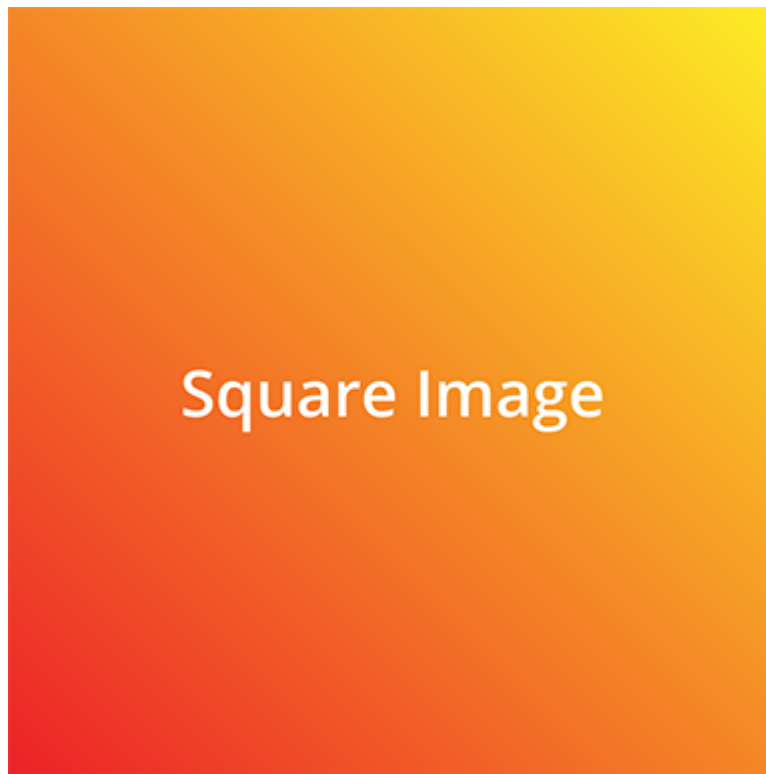


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Tables

Table 7: A table with a top caption and specified relative column widths.

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Table 9: A table with merged cells using the `attributes` plugin.

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Equations

A LaTeX equation:

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(5)

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The Models to Predict the Amount of Bike Sharing

Based on the exploratory data analysis, regular neural network is used to figure out the project.

Neural network is a model that optimize the parameters through learning process to recognize hidden relationships between different data.

Because of the low correlation between given factors and previous related studies of other researchers, regular neural network probably is the most appropriate model to solve the project. There are 4 steps to build and train neural network, including selecting features, data preprocessing, designing layers and parameters, determining training methods. Dana’s code is an example for implementing this algorithms in python.

The architectures and training methods are shown in this slide. We used different features, epochs, hidden layers, units and learning rates in this project. The evaluation of the models’ performances are based on the root mean squared error(RMSE) between the test data and predictions.

To evaluate and optimize our models, we analyzed the sensitivity of different parameters.

Units of Layers, Layers, Normalization and Learning Rates are analyzed. To avoid the influence of randomization, the evaluation of the performances is according to the average RMSE of 3 separate training with same initial parameters.

The architectures of neural network and main parameters in training methods of sensitivity analysis are shown in fig.X.

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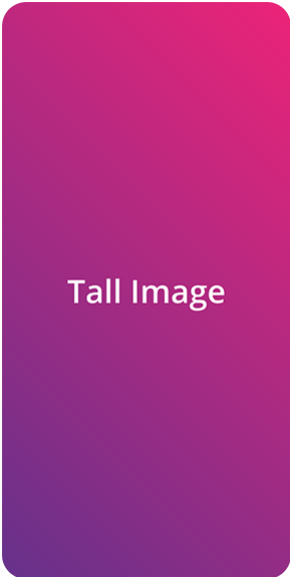


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$$x = a + b + c + d + e + f + g + h + i + j + k + l + m + n + o + p + q + r + s + t + u + v + w + x + y + z + 1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9$$

(8)

Special

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white lightgrey grey darkgrey black lightred lightyellow lightgreen
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Experiments of the Prediction Models

Bold text

Semi-bold text

Centered text

Right-aligned text

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Combined *italics* and **bold**

~~Strikethrough~~

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subscript: H₂O is a liquid

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[unicode superscripts](#)⁰¹²³⁴⁵⁶⁷⁸⁹

[unicode subscripts](#)₀₁₂₃₄₅₆₇₈₉

A long paragraph of text. Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.

Putting each sentence on its own line has numerous benefits with regard to [editing](#) and [version control](#).

Line break without starting a new paragraph by putting two spaces at end of line.

Heading 3

Heading 4

Heading 5

Heading 6

A heading centered on its own printed page

Horizontal rule:

Heading 3's and Heading 4's are recommended for sub-sections.

Links

Bare URL link: <https://manubot.org>

[Long link with lots of words and stuff and junk and bleep and blah and stuff and other stuff and more stuff yeah](#)

[Link with text](#)

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Citations

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Figure [21](#)

Figure [22](#)

Figure [23](#)

Figure [24](#)

Table [16](#)

Equation [11](#)

Equation [12](#)

Quotes and code

Quoted text

Quoted block of text

Two roads diverged in a wood, and I—
I took the one less traveled by,
And that has made all the difference.

Code `in the middle` of normal text, aka `inline code`.

Code block with Python syntax highlighting:

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from manubot.cite.doi import expand_short_doi

def test_expand_short_doi():
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        insulyatora-gypsy-na-sintez-ernk-modifikatsii-hromatina-i-
        svyazyvanie-insulyatornyh-belkov-vtransfetsirovannyh-geneticheskikh-
        konstruktsiyah"
```

Code block with no syntax highlighting:

```
Exporting HTML manuscript
Exporting DOCX manuscript
Exporting PDF manuscript
```

Figures



Figure 17: A square image at actual size and with a bottom caption. Loaded from the latest version of image on GitHub.



Figure 18: An image too wide to fit within page at full size. Loaded from a specific (hashed) version of the image on GitHub.

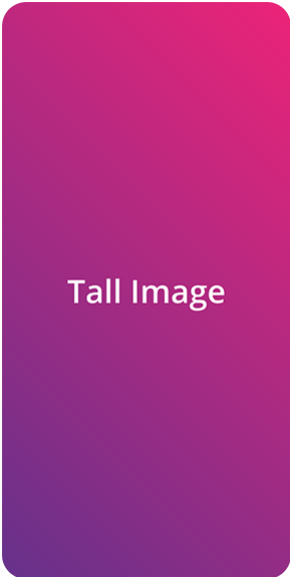


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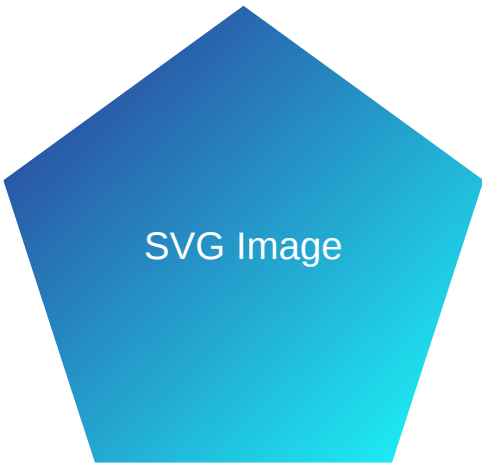


Figure 20: A vector `.svg` image loaded from GitHub. The parameter `sanitize=true` is necessary to properly load SVGs hosted via GitHub URLs. White background specified to serve as a backdrop for transparent sections of the image.

Tables

Table 13: A table with a top caption and specified relative column widths.

<i>Bowling Scores</i>	Jane	John	Alice	Bob
Game 1	150	187	210	105
Game 2	98	202	197	102
Game 3	123	180	238	134

Table 14: A table too wide to fit within page.

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pi	3.14159265358979323846264338327950	288419716939937510582097494459230	781640628620899862803482534211706	piday.org
e	2.71828182845904523536028747135266	249775724709369995957496696762772	407663035354759457138217852516642	nasa.gov

Table 15: A table with merged cells using the `attributes` plugin.

	Colors	
Size	Text Color	Background Color
big	blue	orange
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A LaTeX equation:

$$\int_0^\infty e^{-x^2} dx = \frac{\sqrt{\pi}}{2}$$

(9)

An equation too long to fit within page:

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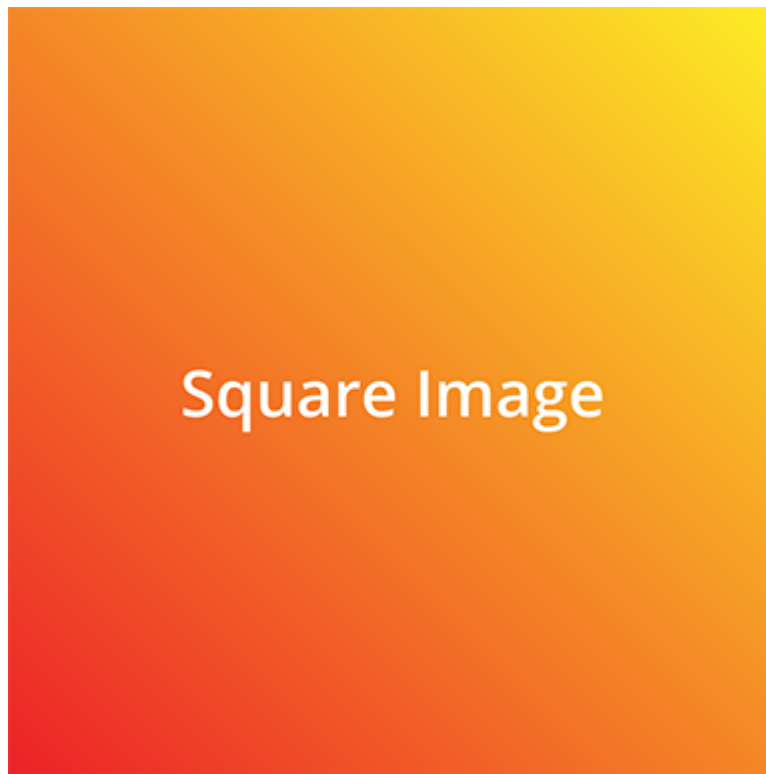


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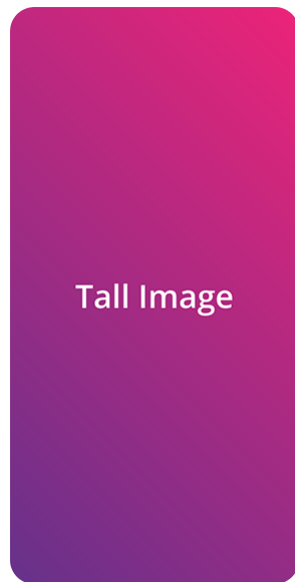


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