

# The Models of London Bike Sharing Prediction

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## Authors

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

# Abstract

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This manuscript is a template (aka “rootstock”) for [Manubot](#), a tool for writing scholarly manuscripts. Use this template as a starting point for your manuscript.

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## Introduction

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**Bold text**

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Centered text

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*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
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subscript: H<sub>2</sub>O is a liquid

superscript: 2<sup>10</sup> is 1024.

[unicode superscripts](#)<sup>0123456789</sup>

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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 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>

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## Citations

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## Referencing figures, tables, equations

Figure [25](#)

Figure [26](#)

Figure [27](#)

Figure [28](#)

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:

```
from manubot.cite.doi import expand_short_doi

def test_expand_short_doi():
    doi = expand_short_doi("10/c3bp")
    # a string too long to fit within page:
    assert doi == "10.25313/2524-2695-2018-3-vliyanie-enhansera-copia-i-
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        svyazyvanie-insulyatornyh-belkov-vtransfetsirovannyh-geneticheskikh-
        konstruktsiyah"
```

Code block with no syntax highlighting:

```
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```

## 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
Game 2	98	202	197	102
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**Table 2:** A table too wide to fit within page.

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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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## Literature Review

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        konstruktsiyah"
```

Code block with no syntax highlighting:

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## Figures



**Figure 5: A square image at actual size and with a bottom caption.** Loaded from the latest version of image on GitHub.



**Figure 6: 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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**Table 4:** A table with a top caption and specified relative column widths.

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



	Colors	
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small	black	white

## Equations

A LaTeX equation:

$$\int_0^\infty e^{-x^2} dx = \frac{\sqrt{\pi}}{2} \tag{3}$$

An equation too long to fit within page:

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## Data Analysis

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Code block with Python syntax highlighting:

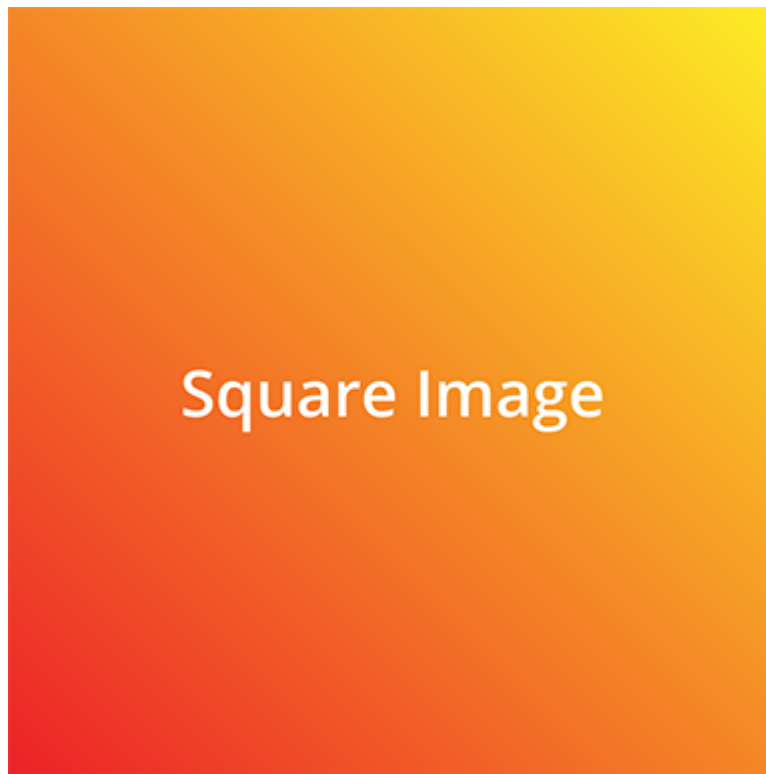
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from manubot.cite.doi import expand_short_doi

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```

Code block with no syntax highlighting:

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## Figures



**Figure 9: A square image at actual size and with a bottom caption.** Loaded from the latest version of image on GitHub.



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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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small	black	white

## Equations

A LaTeX equation:

$$\int_0^\infty e^{-x^2} dx = \frac{\sqrt{\pi}}{2} \tag{5}$$

An equation too long to fit within page:

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

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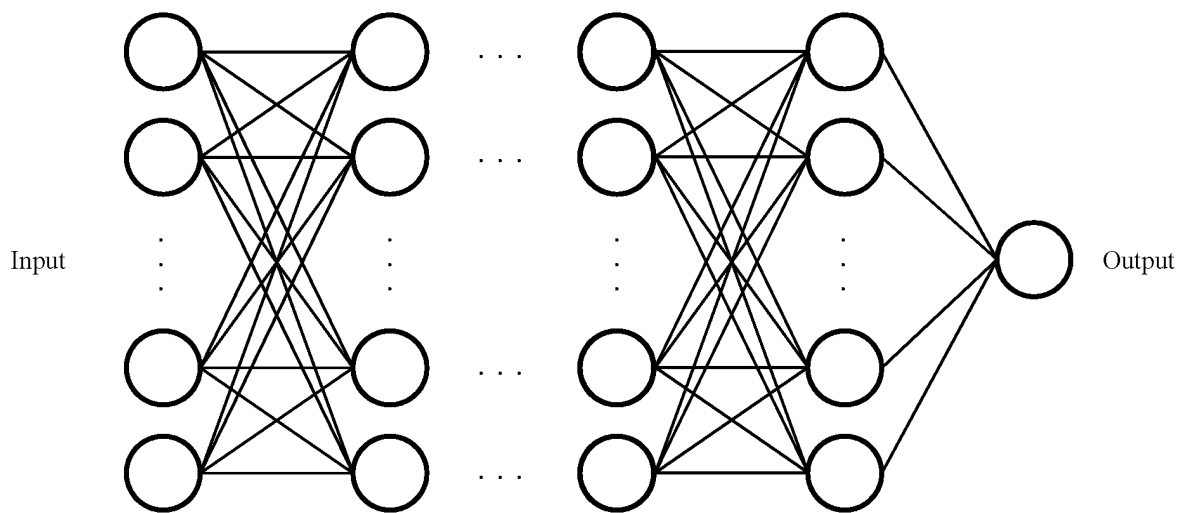
---

### ###Regular Neural Network

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 features, regular neural network probably is the most appropriate model to solve the project. The architecture of regular neural network is shown in Fig 4.1.

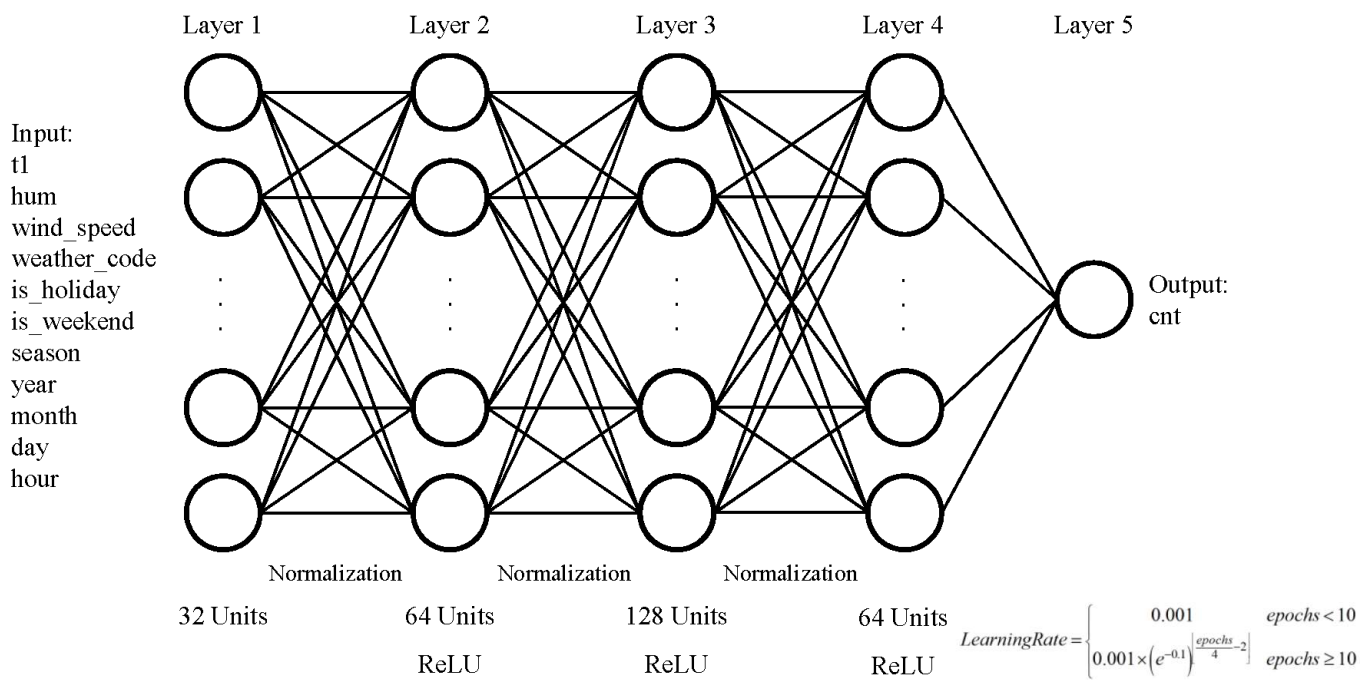


**Figure 13:** Regular Neural Network

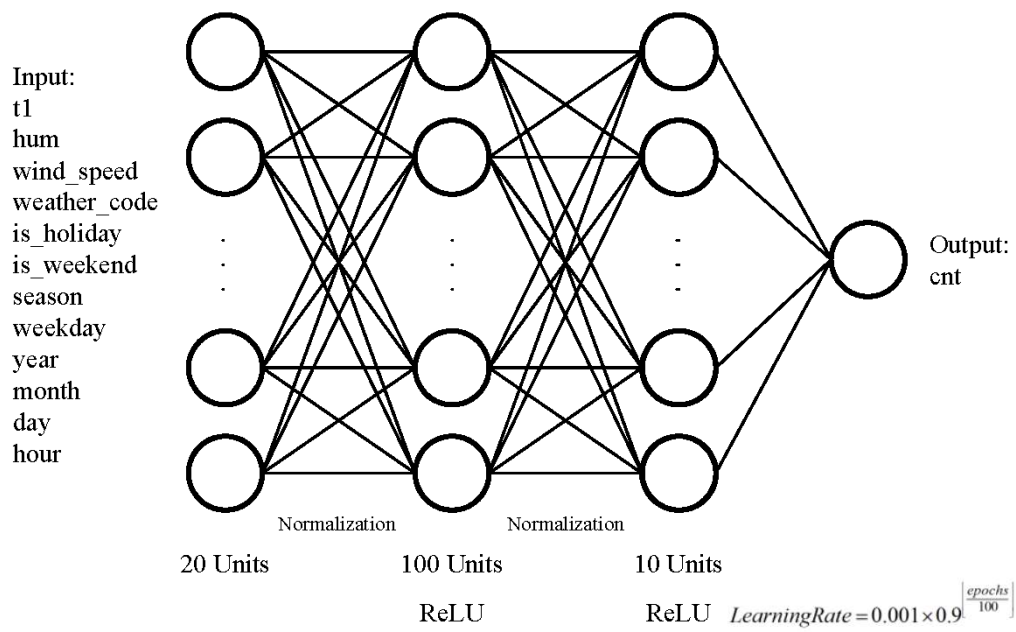
There are 4 steps to build and train neural network, including:

- Selecting features;
- Data preprocessing;
- Designing layers and parameters;
- Determining training methods.

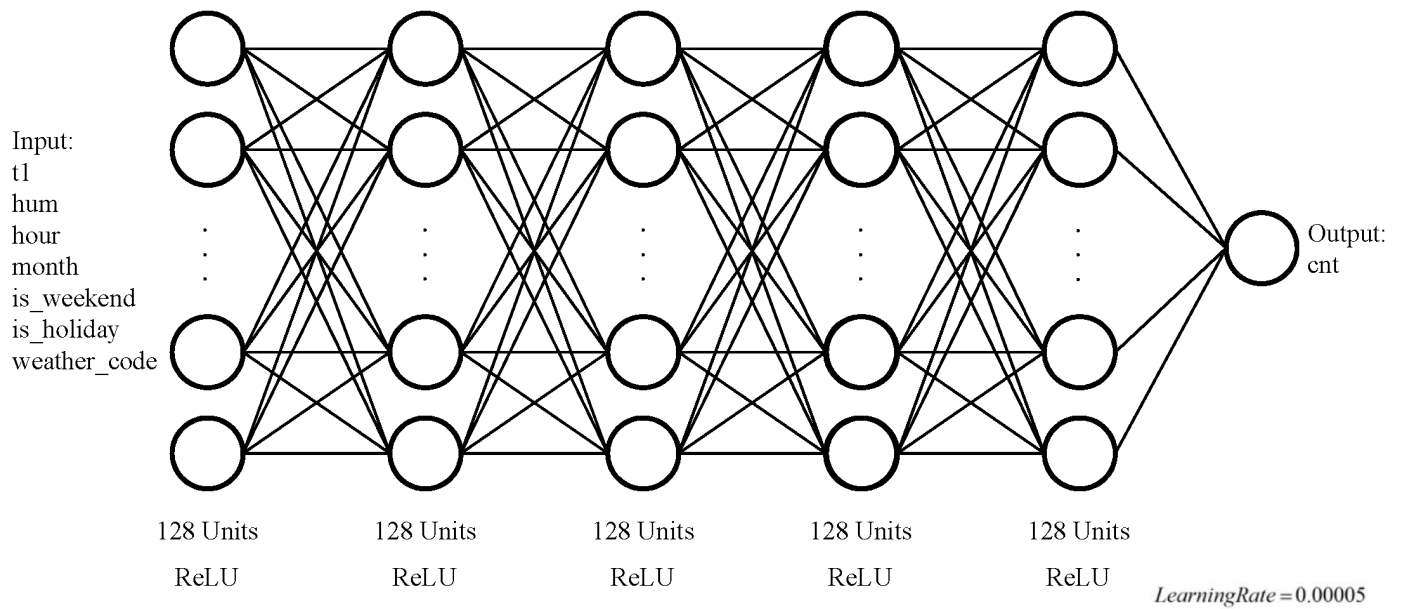
We used different features, epochs, hidden layers, units and learning rates in this project. The evaluation of the models' performances are based on the root mean squared error(RMSE) between the test data and predictions. The architectures of our models are shown in Fig 4.2 - Fig 4.4.



**Figure 14:** Jingzi's Model



**Figure 15:** Anye's Model



**Figure 16:** Dana's Model

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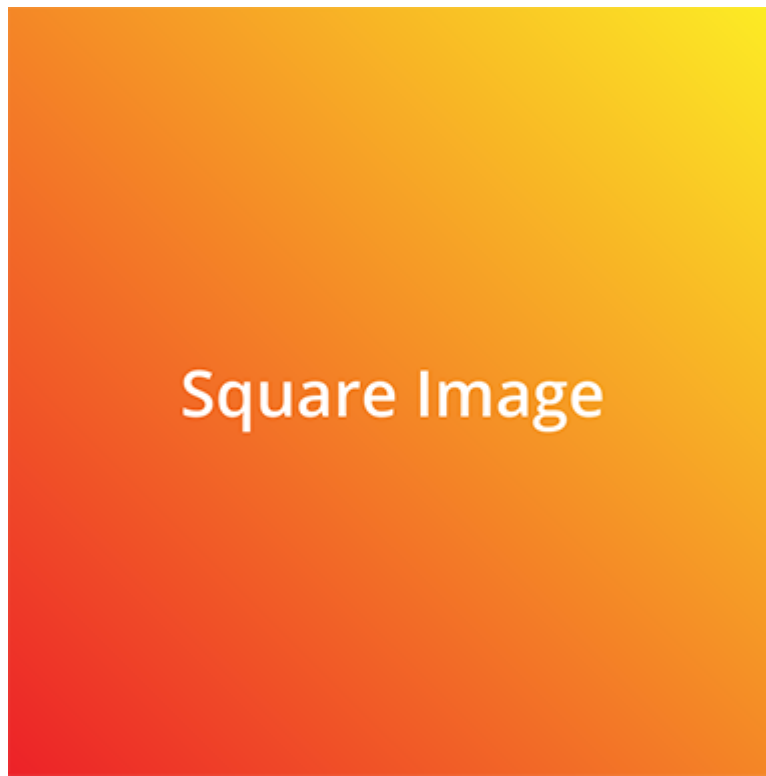
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    assert doi == "10.25313/2524-2695-2018-3-vliyanie-enhansera-copia-i-
        insulyatora-gypsy-na-sintez-ernk-modifikatsii-hromatina-i-
        svyazyvanie-insulyatornyh-belkov-vtransfetsirovannyh-geneticheskikh-
        konstruktsiyah"
```

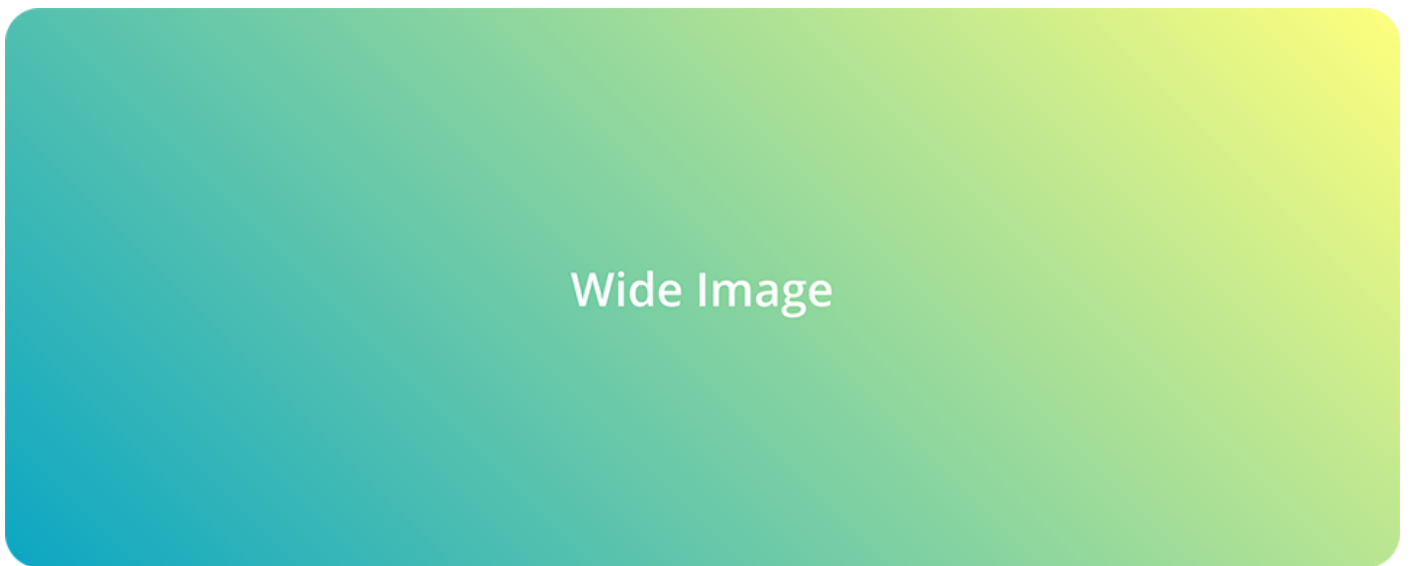
Code block with no syntax highlighting:

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

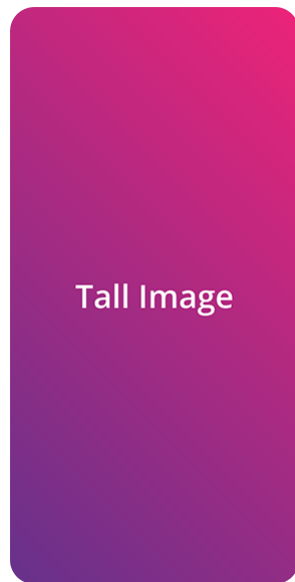
## Figures



**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.



**Figure 19: A tall image with a specified height.** Loaded from a specific (hashed) version of the image on GitHub.



**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 10:** A table with a top caption and specified relative column widths.

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

**Table 11:** A table too wide to fit within page.

	<b>Digits 1-33</b>	<b>Digits 34-66</b>	<b>Digits 67-99</b>	<b>Ref.</b>
pi	3.14159265358979323846264338327950	288419716939937510582097494459230	781640628620899862803482534211706	<a href="#">piday.org</a>
e	2.71828182845904523536028747135266	249775724709369995957496696762772	407663035354759457138217852516642	<a href="#">nasa.gov</a>

**Table 12:** 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:

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

(7)

An equation too long to fit within page:

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

(8)

Special

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white lightgrey grey darkgrey black lightred lightyellow lightgreen lightblue lightpurple red orange yellow green blue purple

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## Experiments of the Prediction Models

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**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
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- List item
- List item
- List item

subscript: H<sub>2</sub>O is a liquid

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[unicode superscripts](#)<sup>0123456789</sup>

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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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[Link by reference](#)

## Citations

Citation by DOI [[1](#)].

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## Referencing figures, tables, equations

Figure [25](#)

Figure [26](#)

Figure [27](#)

Figure [28](#)

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:

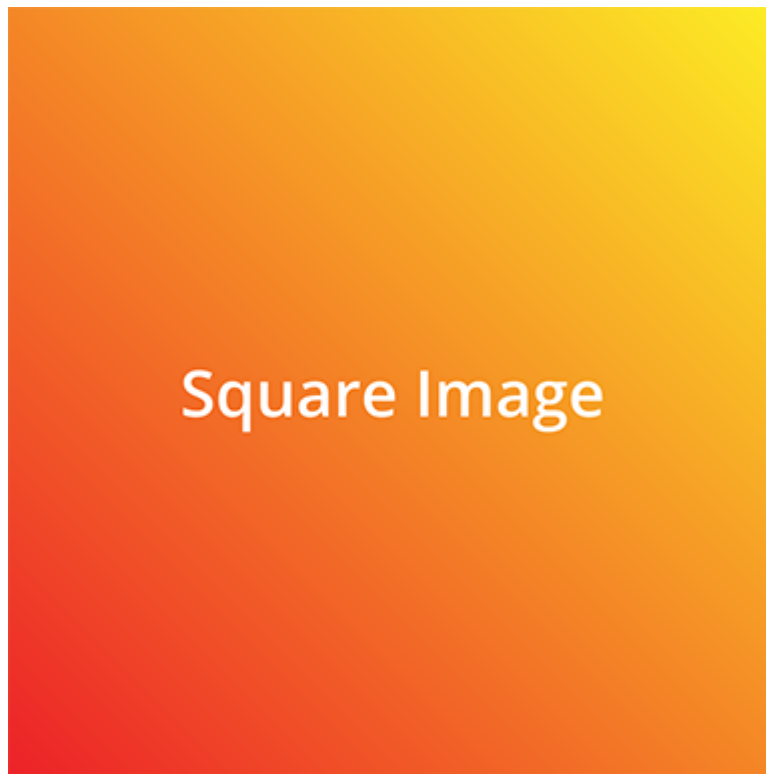
```
from manubot.cite.doi import expand_short_doi

def test_expand_short_doi():
    doi = expand_short_doi("10/c3bp")
    # a string too long to fit within page:
    assert doi == "10.25313/2524-2695-2018-3-vliyanie-enhansera-copia-i-
        insulyatora-gypsy-na-sintez-ernk-modifikatsii-hromatina-i-
        svyazyvanie-insulyatornyh-belkov-vtransfetsirovannyh-geneticheskikh-
        konstruktsiyah"
```

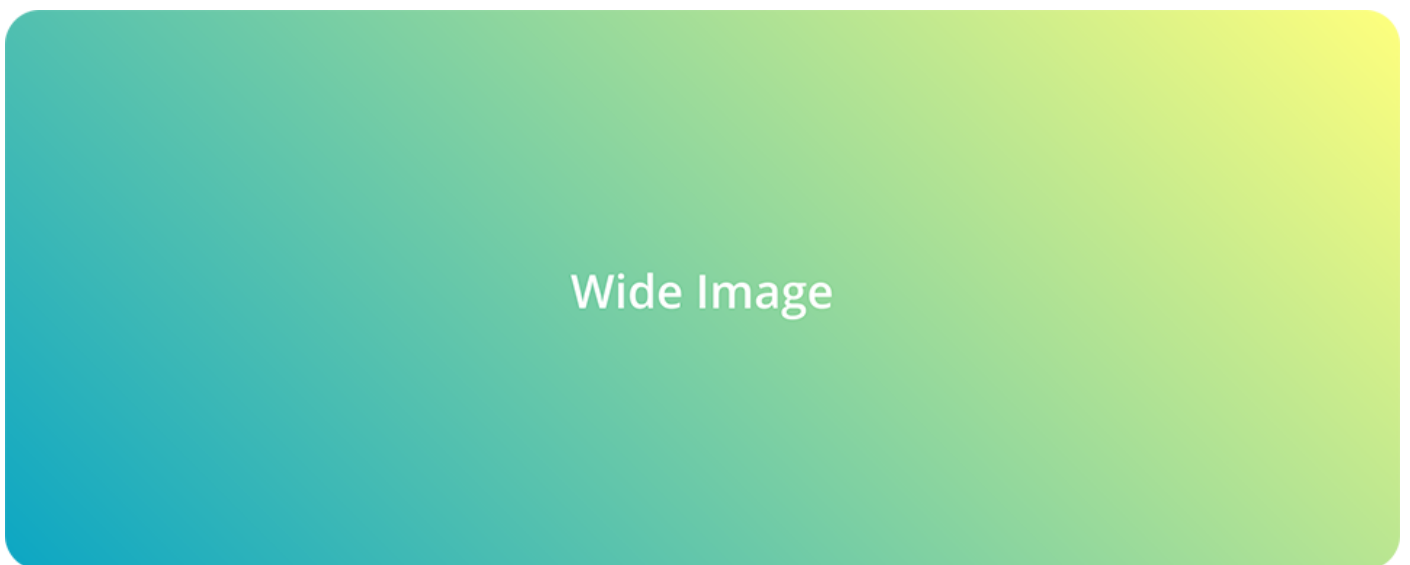
Code block with no syntax highlighting:

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

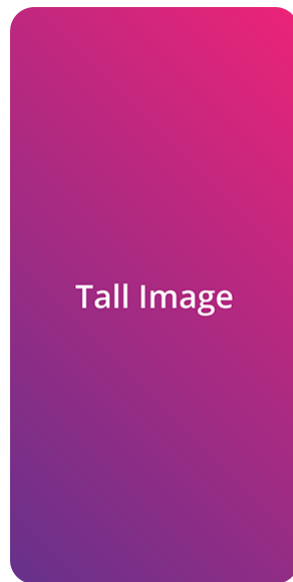
## Figures



**Figure 21: A square image at actual size and with a bottom caption.** Loaded from the latest version of image on GitHub.



**Figure 22: An image too wide to fit within page at full size.** Loaded from a specific (hashed) version of the image on GitHub.



**Figure 23: A tall image with a specified height.** Loaded from a specific (hashed) version of the image on GitHub.



**Figure 24: 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
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Game 3	123	180	238	134

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

	Digits 1-33	Digits 34-66	Digits 67-99	Ref.
pi	3.14159265358979323846264338327950	288419716939937510582097494459230	781640628620899862803482534211706	<a href="#">piday.org</a>
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**Table 15:** A table with merged cells using the `attributes` plugin.

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small	black	white

## Equations

A LaTeX equation:

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

(9)

An equation too long to fit within page:

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

(10)

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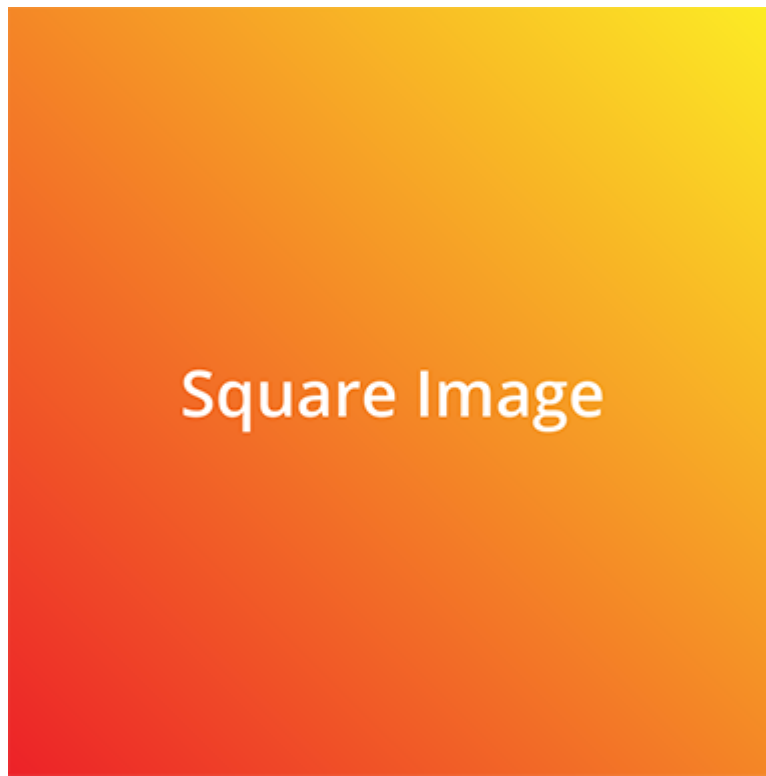
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        svyazyvanie-insulyatornyh-belkov-vtransfetsirovannyh-geneticheskikh-
        konstruktsiyah"
```

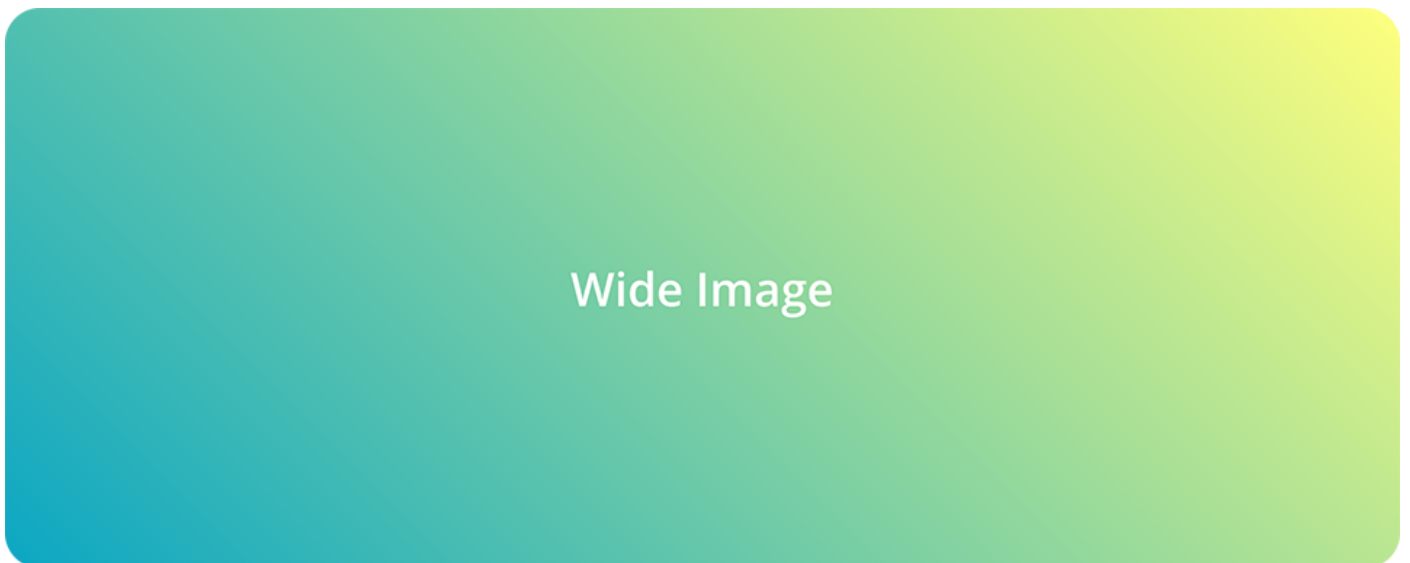
Code block with no syntax highlighting:

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

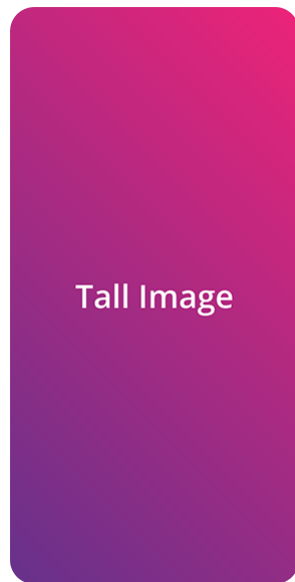
## Figures



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**Table 16:** A table with a top caption and specified relative column widths.

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**Table 17:** A table too wide to fit within page.

	Digits 1-33	Digits 34-66	Digits 67-99	Ref.
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(12)

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DOI: [10.7554/elife.32822](https://doi.org/10.7554/elife.32822) · PMID: [29424689](https://pubmed.ncbi.nlm.nih.gov/29424689/) · PMCID: [PMC5832410](https://pubmed.ncbi.nlm.nih.gov/PMC5832410/)

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Brett K Beaulieu-Jones, Casey S Greene

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Douglas Heaven

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*Manubot* (2020-05-25) <https://greenelab.github.io/meta-review/>

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Travers Ching, Daniel S. Himmelstein, Brett K. Beaulieu-Jones, Alexandr A. Kalinin, Brian T. Do, Gregory P. Way, Enrico Ferrero, Paul-Michael Agapow, Michael Zietz, Michael M. Hoffman, ... Casey S. Greene

*Journal of The Royal Society Interface* (2018-04-04) <https://doi.org/gddkhn>

DOI: [10.1098/rsif.2017.0387](https://doi.org/10.1098/rsif.2017.0387) · PMID: [29618526](https://pubmed.ncbi.nlm.nih.gov/29618526/) · PMCID: [PMC5938574](https://pubmed.ncbi.nlm.nih.gov/PMC5938574/)

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*PLOS Computational Biology* (2019-06-24) <https://doi.org/c7np>

DOI: [10.1371/journal.pcbi.1007128](https://doi.org/10.1371/journal.pcbi.1007128) · PMID: [31233491](https://pubmed.ncbi.nlm.nih.gov/31233491/) · PMCID: [PMC6611653](https://pubmed.ncbi.nlm.nih.gov/PMC6611653/)