A Study on Workplace Accidents

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*Abstract*

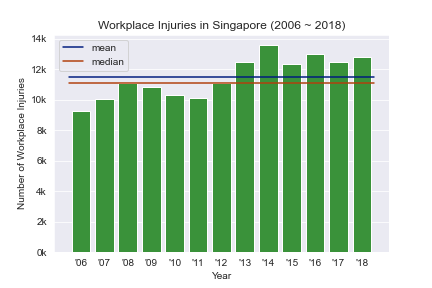
*This paper seeks to investigate the most dangerous and hazardous types of workplace incidents, and to design an appropriate machine learning algorithm to predict the outcome of any such accident. The task is a classification problem, and the dataset to be used is sourced from data.gov.sg. Given several characteristics of an accident at work, predict if it results in a minor or major injury, or if it leads to a fatal outcome.*

Keywords

Technical Paper, Classification, Workplace, Accidents, Incidents

# Introduction

Workplace accidents are not new. In fact, more than 10,000 of such local cases are reported annually. It is of this study's interest to investigate which are the more crucial factors of such workplace incidents (i.e., which lead to the most severe outcomes).



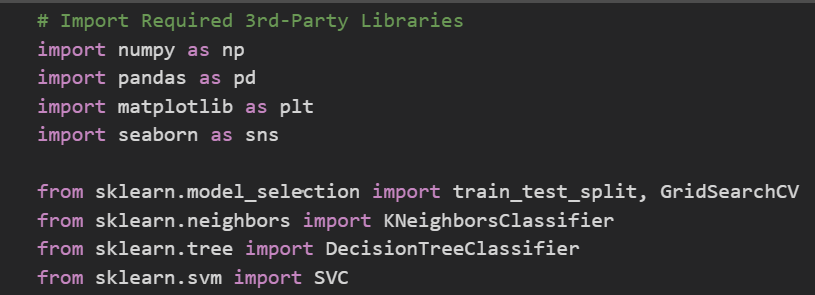
# Related Works

This paper is not the first of its kind to be published; other similar studies and research have been conducted [2][3] prior to the writing of this paper. This paper is neither a proof, an assertion, nor does it intend to compete with the above-mentioned works or other. Please refer to these articles [2][3] for more in-depth and comprehensive compilations.

# Experiment

## Dependencies

To lessen our workload and avoid reinventing the wheel, we will be utilizing third-party libraries, such as NumPy, Pandas, Matplotlib, Seaborn and Scikit-Learn.



This can be easily achieved as depicted in the figure above.

*Notes:*

1. *To keep this study simple, we will only consider the following three classification algorithms: K Nearest Neighbours, Decision Tree and Support Vector Machine.*
2. *These dependencies are not exhaustive (i.e., we might need to import other dependencies later).*

## Data

Before we begin to build any machine learning model, we need data, and, preferably, a lot of it. In our case, we have obtained our data from the data.gov.sg website [1]. The file of interest is titled "workplace-injuries-by-industry-and-incident-types", in Comma-Separated Values (csv) format.

We will import our data using the read\_csv function defined in the pandas package. We will set the header parameter to 0 to specify that the first row of the file contains the header names.

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*a**b* 

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* The subscript for the permeability of vacuum **0, and other common scientific constants, is zero with subscript formatting, not a lowercase letter “o”.
* In American English, commas, semicolons, periods, question and exclamation marks are located within quotation marks only when a complete thought or name is cited, such as a title or full quotation. When quotation marks are used, instead of a bold or italic typeface, to highlight a word or phrase, punctuation should appear outside of the quotation marks. A parenthetical phrase or statement at the end of a sentence is punctuated outside of the closing parenthesis (like this). (A parenthetical sentence is punctuated within the parentheses.)
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* There is no period after the “et” in the Latin abbreviation “et al.”.
* The abbreviation “i.e.” means “that is”, and the abbreviation “e.g.” means “for example”.

An excellent style manual for science writers is [7].

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1. Table Type Styles

| Table Head | Table Column Head | | |
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| Table column subhead | Subhead | Subhead |
| copy | More table copya |  |  |

1. Sample of a Table footnote. (*Table footnote*)
2. Example of a figure caption. (*figure caption*)

Figure Labels: Use 8 point Times New Roman for Figure labels. Use words rather than symbols or abbreviations when writing Figure axis labels to avoid confusing the reader. As an example, write the quantity “Magnetization”, or “Magnetization, M”, not just “M”. If including units in the label, present them within parentheses. Do not label axes only with units. In the example, write “Magnetization (A/m)” or “Magnetization {A[m(1)]}”, not just “A/m”. Do not label axes with a ratio of quantities and units. For example, write “Temperature (K)”, not “Temperature/K”.

##### Acknowledgment *(Heading 5)*

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1. GovTech. (2019). *Workplace Injuries, Annual* [Online] Available at: <https://data.gov.sg/dataset/workplace-injuries-annual> [Accessed 29 May 2021]
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6. R. Nicole, “Title of paper with only first word capitalized,” J. Name Stand. Abbrev., in press.
7. Y. Yorozu, M. Hirano, K. Oka, and Y. Tagawa, “Electron spectroscopy studies on magneto-optical media and plastic substrate interface,” IEEE Transl. J. Magn. Japan, vol. 2, pp. 740–741, August 1987 [Digests 9th Annual Conf. Magnetics Japan, p. 301, 1982].
8. M. Young, The Technical Writer’s Handbook. Mill Valley, CA: University Science, 1989.

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