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南方科技大学

SOUTHERN UNIVERSITY OF SCIENCE AND TECHNOLOGY

本科生毕业设计（论文）

题　　目： 南方科技大学毕业论文模板设计

LaTeX 形式 v1.3.1

副标题

姓　　名： 梁钰栋

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系　　别： 数学系

专　　业： 信息与计算科学

指导教师： 高德纳 教授

2019 年 12 月 8 日

CLC _____ Number _____

UDC _____ Available for reference ☐Yes ☐No

SUSTech Southern University of Science and Technology

Undergraduate Thesis

Thesis Title: **Graduation Thesis Template**

LaTeX Format v1.3.1

Sub-title

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Thesis Advisor: **Donald E. Knuth Professor**

Date: December 8, 2019

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梁钰栋

（数学系　指导教师：高德纳）

[摘要]：Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetuer id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris ut leo. Cras viverra metus rhoncus sem. Nulla et lectus vestibulum urna fringilla ultrices. Phasellus eu tellus sit amet tortor gravida placerat. Integer sapien est, iaculis in, pretium quis, viverra ac, nunc. Praesent eget sem vel leo ultrices bibendum. Aenean faucibus. Morbi dolor nulla, malesuada eu, pulvinar at, mollis ac, nulla. Curabitur auctor semper nulla. Donec varius orci eget risus. Duis nibh mi, congue eu, accumsan eleifend, sagittis quis, diam. Duis eget orci sit amet orci dignissim rutrum.

[关键词]：LaTeX；接口

[**ABSTRACT**]: Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetuer id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris ut leo. Cras viverra metus rhoncus sem. Nulla et lectus vestibulum urna fringilla ultrices. Phasellus eu tellus sit amet tortor gravida placerat. Integer sapien est, iaculis in, pretium quis, viverra ac, nunc. Praesent eget sem vel leo ultrices bibendum. Aenean faucibus. Morbi dolor nulla, malesuada eu, pulvinar at, mollis ac, nulla. Curabitur auctor semper nulla. Donec varius orci eget risus. Duis nibh mi, congue eu, accumsan eleifend, sagittis quis, diam. Duis eget orci sit amet orci dignissim rutrum.

[**Key words**]: LaTeX, R Markdown, pandoc

Contents

The following are useful for understanding R Markdown:

- Authoring Books and Technical Documents with R Markdown
- R Markdown: The Definitive Guide
- R Markdown Cookbook

1. Markdown Syntax

EMTH, *Italic*, H_2SO_4, Fe^{2+}, Footnote[1]

- list
- list

1. Numbered list
2. Numbered list

a. Alternative numbered list
b. Alternative numbered list

Inline Math $a^2 + b^2$, Math block:

$$\sum_{i=1}^{\infty} \frac{1}{n^2} = \frac{\pi^2}{6}$$

2. Markdown extensions by bookdown

Bookdown supply an extension of pandoc, which is already a superset of plain markdwon and TeX.

2.1 Cross reference and citation

[1] supply a neat way to do cross citation of "theorems"(or numbered environment) and proofs(or unnumbered environment), in which you can write anything freely(even recursively)[3,2].

Check source code of theorem 2.1, figure 1, table 1 to see how they work, then you will find two ways to cite(bracketed or not).

We refer to here for the all supported environments.

Theorem 2.1 (Fermat's Last Theorem)**.** *For $n \geq 2$, there is no $a, b, c \in \mathbb{N}^*$ s.t.*

$$x^n + y^n = z^n$$

Proof. I have discovered a truly marvelous proof of this, which this margin is too narrow to contain □

[1] Some footnote

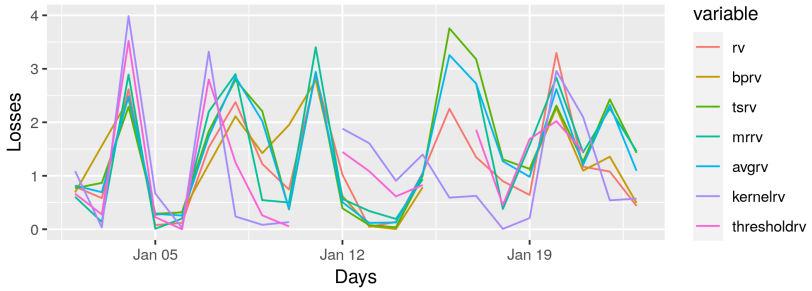

图 1 Text figures

表 1 A table of the first 10 rows of the mtcars data.

	mpg	cyl	disp	hp	drat	wt	qsec	vs
Mazda RX4	21.0	6	160.0	110	3.90	2.620	16.46	0
Mazda RX4 Wag	21.0	6	160.0	110	3.90	2.875	17.02	0
Datsun 710	22.8	4	108.0	93	3.85	2.320	18.61	1
Hornet 4 Drive	21.4	6	258.0	110	3.08	3.215	19.44	1
Hornet Sportabout	18.7	8	360.0	175	3.15	3.440	17.02	0
Valiant	18.1	6	225.0	105	2.76	3.460	20.22	1
Duster 360	14.3	8	360.0	245	3.21	3.570	15.84	0
Merc 240D	24.4	4	146.7	62	3.69	3.190	20.00	1
Merc 230	22.8	4	140.8	95	3.92	3.150	22.90	1
Merc 280	19.2	6	167.6	123	3.92	3.440	18.30	1

3. Chapter

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[2] Xie Y. bookdown: Authoring Books and Technical Documents with R Markdown[M]. Boca Raton, Florida: Chapman; Hall/CRC, 2016.

[3] Xie Y, Dervieux C, Riederer E. R Markdown Cookbook[M]. Boca Raton, Florida: Chapman; Hall/CRC, 2020.

A Code

Attach code used here

```
#!/usr/bin/python3
# -*- encoding: utf-8 -*-
'''
@File      : utils.py
@Time      : 2019/11/01
@Author    : Iydon Liang
@Contact   : liangiydon AT gmail.com
@Docstring : <no docstring>
'''

import pandas as pd
import tushare as ts


def get_data_via_tushare(stocks, start=None, end=None, method=None, ignore=None):
    '''Get `stocks` data via `tushare.{method}` from `start` to `end`.

    Argument
    --------
    stocks: dict, `stocks.keys()` is the names of `stocks`,
        `stocks.values()` is the code of `stocks`.
    start: str, default is '2018-04-01', its format matches '%Y-%m-%d',
        see also `time.strftime`.
    end: str, default is '2019-04-01', its format matches '%Y-%m-%d',
        see also `time.strftime`.
    method: str, default is 'get_k_data', attribution of `tushare`
    ignore: Iterable, default is '["date", "code"]', which cannot appear
        in `return_value.keys()` (value of return statement).

    Return
    ------
    dict, and `ignore` has no elements in `return_value.keys()`.
        type of `return_value.values()` is `pandas.core.frame.DataFrame`.

    Require
    -------
    Python 3.7.4
    ts: `import tushare as ts`, test version 1.2.48.
    pd: `import pandas as pd`, test version 0.25.2

    Example
    -------
    >>> stocks = {'50ETF':'510050', '500ETF':'510500'}
    >>> start, end = '2018-04-01', '2019-04-01'
    >>> method = 'get_k_data'
    >>> data = get_data_via_tushare(stocks, start, end, method=method)
```

```
    >>> data.keys()
    dict_keys(['open', 'close', 'high', 'low', 'volume'])
    >>> data['close'].head()
                50ETF  500ETF
    date
    2018-04-02  2.702   6.424
    2018-04-03  2.693   6.373
    2018-04-04  2.694   6.321
    2018-04-09  2.711   6.331
    2018-04-10  2.775   6.380

    SeeAlso
    --------
    1. [tushare](http://tushare.org/)
    2. [pandas](https://pandas.pydata.org/)
    '''
    if __debug__:
        # judge `stocks`
        assert isinstance(stocks, dict), 'Argument `stocks` must be `dict`.'
        assert stocks, 'Argument `stocks` cannot be empty.'
    _start = start or '2018-04-01'
    _end = end or '2019-04-01'
    _ignore = ignore or ['date', 'code']
    _method = method or 'get_k_data'
    data = [getattr(ts, _method)(code, start=_start, end=_end)
        for stock, code in stocks.items()]
    date_index = data[0].date  # hardcode?
    result = dict()
    for column in data[0].columns:  # hardcode?
        if column in _ignore:
            continue
        data_column = [getattr(d, column) for d in data]
        result[column] = pd.concat(data_column, axis=1)
        result[column].columns = stocks
        result[column].index = date_index
    return result


if __name__ == '__main__':
    # Use `scipy.io.savemat` to save data as MATLAB format.
    stocks = {'50ETF':'510050', '500ETF':'510500'}
    start, end = '2018-04-01', '2019-04-01'
    data = get_data_via_tushare(stocks, start, end)
```

致谢

This repo credit to:

- sustechthesis
- bookdown
- tinytex