

2021_LinearAlgebra_Project#1

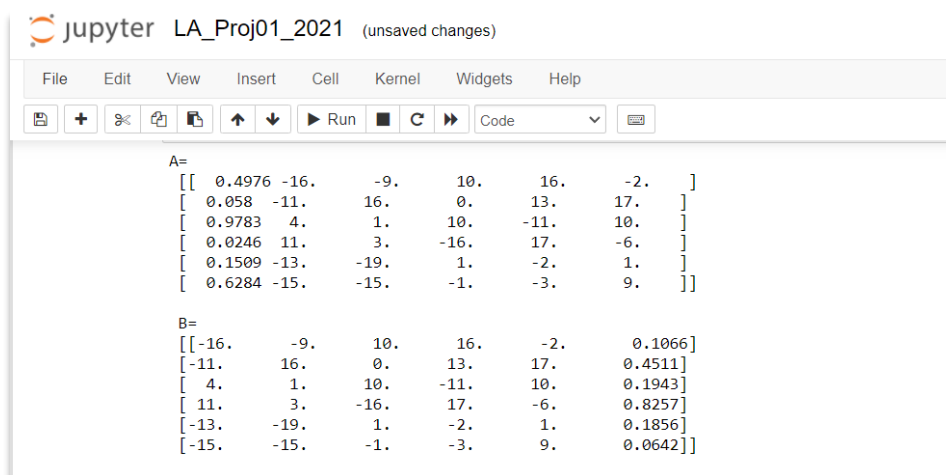
作業說明

- 截止日期：10/30(日) 23:59 分
- 程式語言：Python
 - 矩陣請使用Numpy 套件的 array
- 繳交資料：上傳程式碼.ipynb 檔，檔改名為 **Project01_學號姓名.ipynb**

作業題目(共三題)

1. 讀檔：請利用 mat4py 套件讀取 Project01_data.mat 檔裡的矩陣 A 和 B,並將兩矩陣 print 出來。

輸出結果：



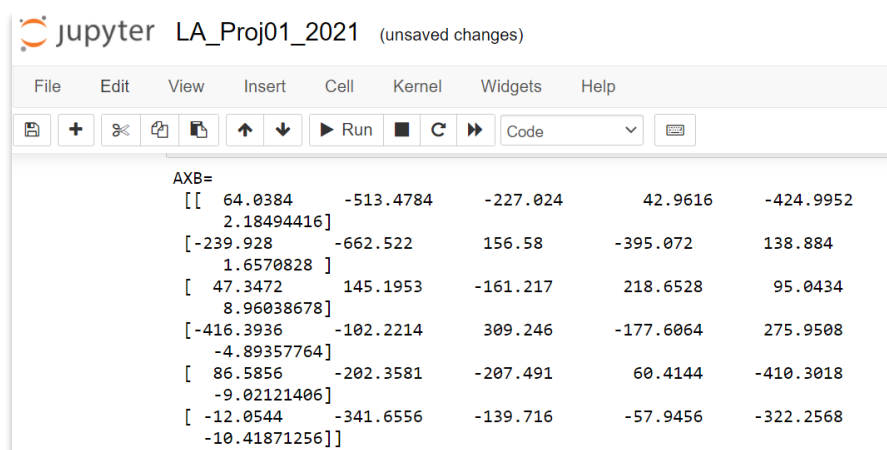
```
jupyter LA_Proj01_2021 (unsaved changes)
File Edit View Insert Cell Kernel Widgets Help
+ < > Run [ ] Code v

A=
[[ 0.4976 -16.    -9.    10.    16.    -2. ]
 [ 0.058  -11.    16.    0.    13.    17. ]
 [ 0.9783  4.     1.    10.   -11.   10. ]
 [ 0.0246  11.    3.    -16.   17.   -6. ]
 [ 0.1509 -13.   -19.    1.    -2.    1. ]
 [ 0.6284 -15.   -15.   -1.    -3.    9. ]]

B=
[[-16.    -9.    10.    16.    -2.    0.1066]
 [-11.    16.    0.    13.    17.    0.4511]
 [ 4.     1.    10.   -11.   10.    0.1943]
 [ 11.    3.   -16.   17.   -6.    0.8257]
 [-13.   -19.    1.    -2.    1.    0.1856]
 [-15.   -15.   -1.    -3.    9.    0.0642]]
```

2. 矩陣相乘：請利用 Project01_data.mat 檔裡的矩陣 A 和 B 做矩陣相乘 $A \times B$,並將結果 print 出來。

輸出結果：



```
jupyter LA_Proj01_2021 (unsaved changes)
File Edit View Insert Cell Kernel Widgets Help
+ < > Run [ ] Code v

AXB=
[[ 64.0384   -513.4784   -227.024    42.9616   -424.9952
  2.18494416]
 [-239.928   -662.522    156.58     -395.072    138.884
  1.6570828 ]
 [ 47.3472   145.1953   -161.217    218.6528    95.0434
  8.96038678]
 [-416.3936  -102.2214    309.246    -177.6064    275.9508
 -4.89357764]
 [ 86.5856   -202.3581   -207.491     60.4144   -410.3018
 -9.02121406]
 [-12.0544   -341.6556   -139.716    -57.9456   -322.2568
 -10.41871256]]
```

3. 高斯-喬登消去法(Gauss-Jordan elimination): 利用 Project01_data.mat 檔裡的矩陣 Z 做

高斯-喬登消去法(Gauss-Jordan elimination)並將結果 print 出來。

輸出結果：(輸出下列任一結果都正確)

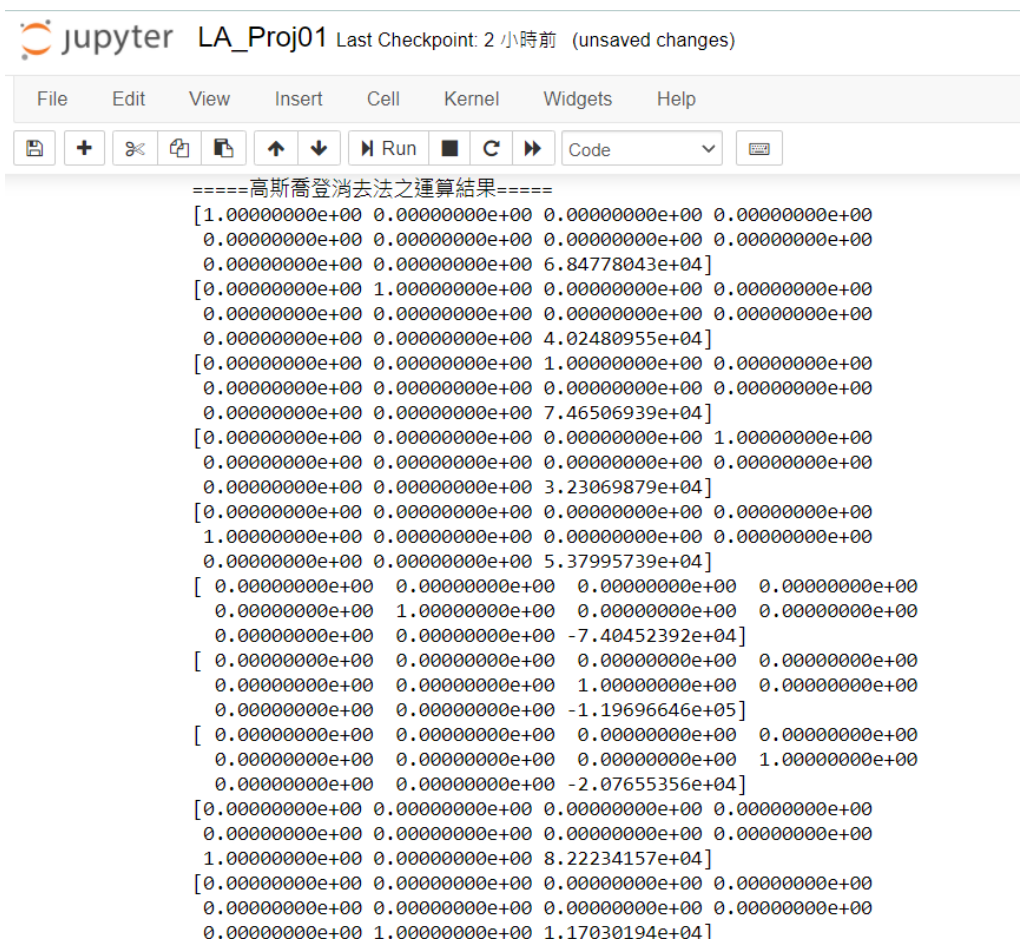
(1) array type=int



A screenshot of a Jupyter Notebook titled "LA_Proj01_2021 (autosaved)". The interface shows a menu bar with File, Edit, View, Insert, Cell, Kernel, Widgets, and Help. Below the menu is a toolbar with icons for saving, adding cells, undo, redo, and running code. The code cell contains a 10x10 matrix of integers, which is the result of Gauss-Jordan elimination. The matrix is displayed as follows:

```
[1 0 0 0 0 0 0 0 0 0]
[ 0 1 0 0 0 0 0 0 0 0]
[ 0 0 1 0 0 0 0 0 0 0]
[0 0 0 1 0 0 0 0 0 0]
[0 0 0 0 1 0 0 0 0 0]
[ 0 0 0 0 0 1 0 0 0 0]
[ 0 0 0 0 0 0 1 0 0 0]
[ 0 0 0 0 0 0 0 1 0 0]
[0 0 0 0 0 0 0 0 1 0]
[0 0 0 0 0 0 0 0 0 1]
```

(2) array type=float



A screenshot of a Jupyter Notebook titled "LA_Proj01 Last Checkpoint: 2 小時前 (unsaved changes)". The interface shows a menu bar with File, Edit, View, Insert, Cell, Kernel, Widgets, and Help. Below the menu is a toolbar with icons for saving, adding cells, undo, redo, and running code. The code cell contains a 10x10 matrix of floating-point numbers, which is the result of Gauss-Jordan elimination. The matrix is displayed as follows:

```
====高斯喬登消去法之運算結果====
[1.00000000e+00 0.00000000e+00 0.00000000e+00 0.00000000e+00
 0.00000000e+00 0.00000000e+00 0.00000000e+00 0.00000000e+00
 0.00000000e+00 0.00000000e+00 6.84778043e+04]
[0.00000000e+00 1.00000000e+00 0.00000000e+00 0.00000000e+00
 0.00000000e+00 0.00000000e+00 0.00000000e+00 0.00000000e+00
 0.00000000e+00 0.00000000e+00 4.02480955e+04]
[0.00000000e+00 0.00000000e+00 1.00000000e+00 0.00000000e+00
 0.00000000e+00 0.00000000e+00 0.00000000e+00 0.00000000e+00
 0.00000000e+00 0.00000000e+00 7.46506939e+04]
[0.00000000e+00 0.00000000e+00 0.00000000e+00 1.00000000e+00
 0.00000000e+00 0.00000000e+00 0.00000000e+00 0.00000000e+00
 0.00000000e+00 0.00000000e+00 3.23069879e+04]
[0.00000000e+00 0.00000000e+00 0.00000000e+00 0.00000000e+00
 1.00000000e+00 0.00000000e+00 0.00000000e+00 0.00000000e+00
 0.00000000e+00 0.00000000e+00 5.37995739e+04]
[ 0.00000000e+00 0.00000000e+00 0.00000000e+00 0.00000000e+00
 0.00000000e+00 1.00000000e+00 0.00000000e+00 0.00000000e+00
 0.00000000e+00 0.00000000e+00 -7.40452392e+04]
[ 0.00000000e+00 0.00000000e+00 0.00000000e+00 0.00000000e+00
 0.00000000e+00 0.00000000e+00 1.00000000e+00 0.00000000e+00
 0.00000000e+00 0.00000000e+00 -1.19696646e+05]
[ 0.00000000e+00 0.00000000e+00 0.00000000e+00 0.00000000e+00
 0.00000000e+00 0.00000000e+00 0.00000000e+00 1.00000000e+00
 0.00000000e+00 0.00000000e+00 -2.07655356e+04]
[0.00000000e+00 0.00000000e+00 0.00000000e+00 0.00000000e+00
 0.00000000e+00 0.00000000e+00 0.00000000e+00 0.00000000e+00
 1.00000000e+00 0.00000000e+00 8.22234157e+04]
[0.00000000e+00 0.00000000e+00 0.00000000e+00 0.00000000e+00
 0.00000000e+00 0.00000000e+00 0.00000000e+00 0.00000000e+00
 0.00000000e+00 1.00000000e+00 1.17030194e+04]
```