HW10

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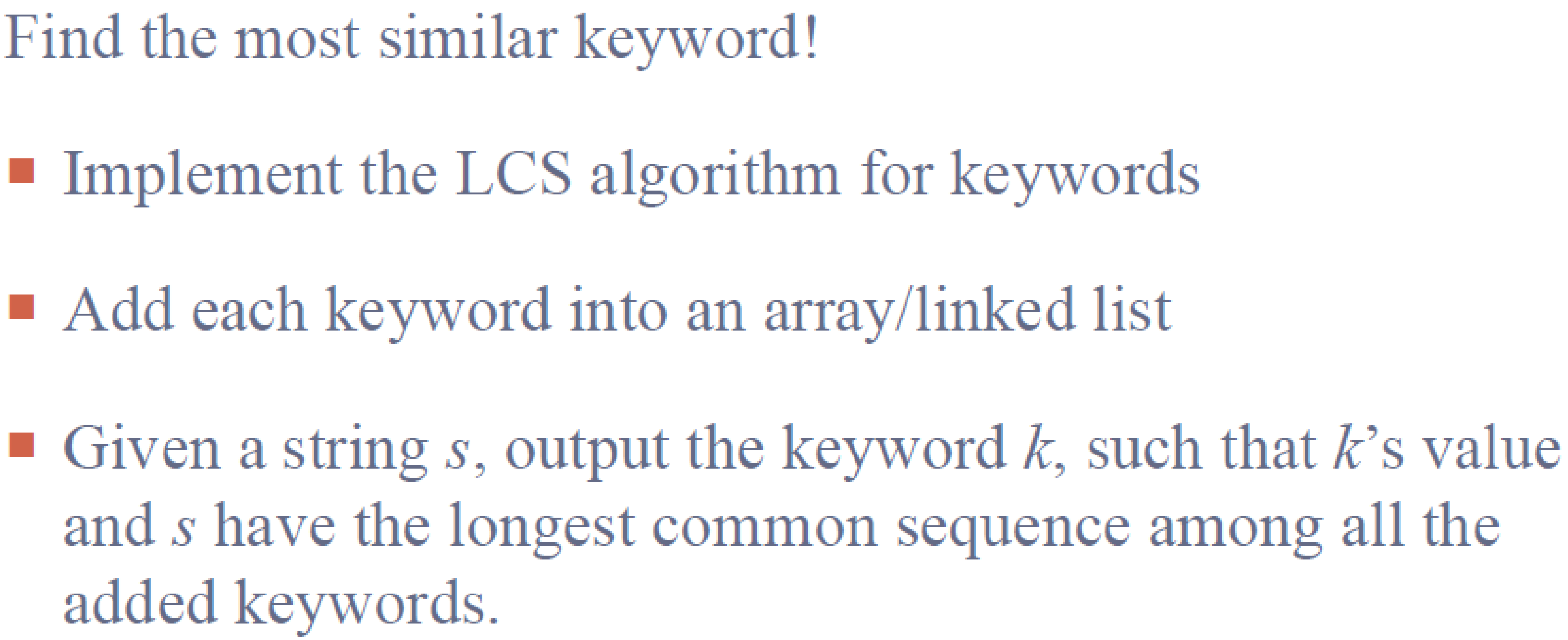
HW10



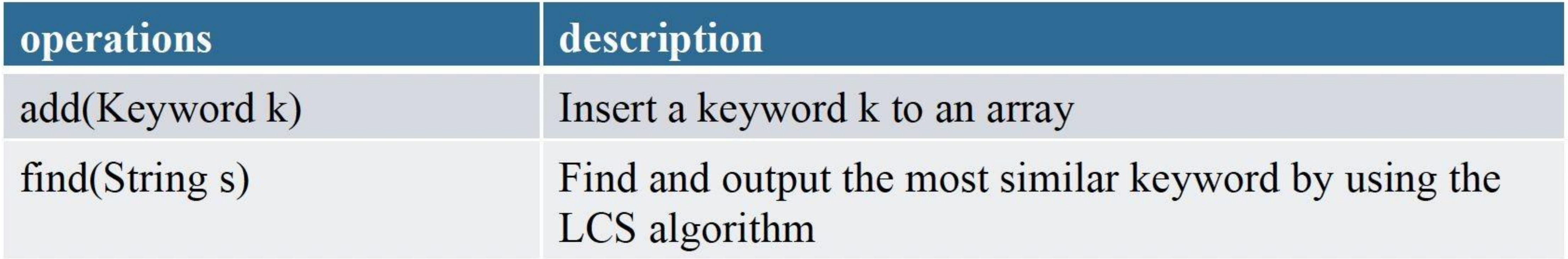
Find the most similar keyword!

- Implement the LCS algorithm for keywords
- Add each keyword into an array/linked list
- Given a string *s*, output the keyword *k*, such that *k*'s value and *s* have the longest common sequence among all the added keywords.

Requirements

- Maintain a keyword list, and implement the LCS algorithm
- For the list structure, you can
  - Use java.util.ArrayList
  - Or develop it by yourself

Operations



operations	description
add(Keyword k)	Insert a keyword k to an array
find(String s)	Find and output the most similar keyword by using the LCS algorithm

Keyword

- A keyword is a tuple of [String *name*, Integer *count*]
  - For example:

    {

    name: “Fang”,

    count: 3

    }
- A keyword should output in format **[name,count]** :
  - [Fang,3]

I/O Example: add

- To do: Insert a keyword [k,c] to the list
- Input:
  - Token1 : a constant “add”
  - Token2 : keyword name **k**
  - Token3 : keyword count **c**
  - EX: add Fang 3

I/O Example: find

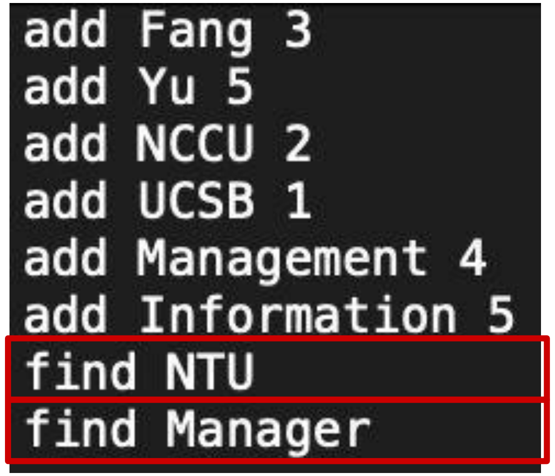
- To do: Find and output the most similar keyword by using the LCS algorithm
- Input:
  - Token1 : a constant “find”
  - Token2 : a string **s**
  - EX: find NTU
- Output:
  - If list is empty, then output “InvalidOperation”:

    InvalidOperation
  - If it is legal:

    NTU: [NCCU, 2]

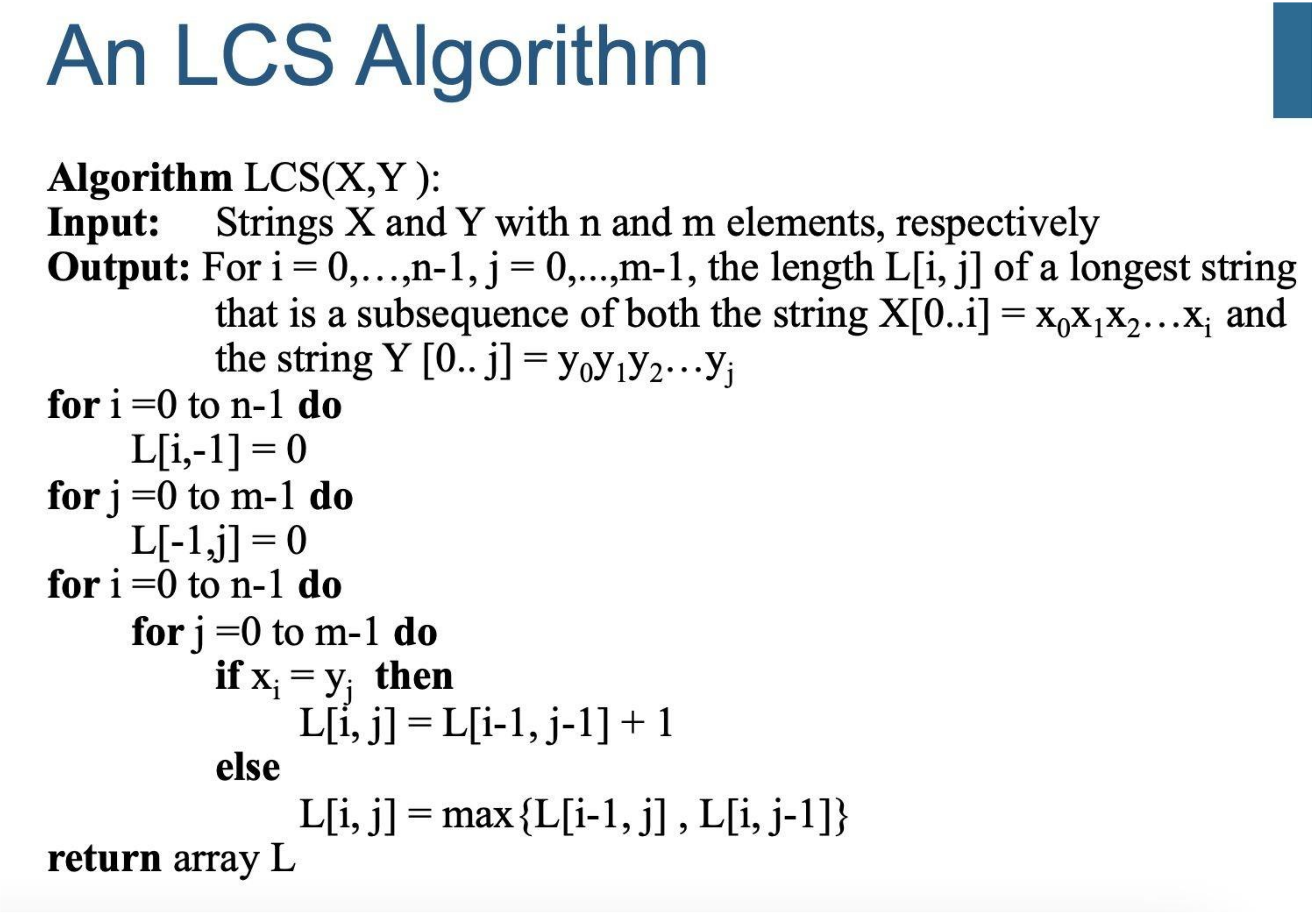
Input file

- You need to read the sequence of operations from a txt file
- The format is firm
- Raise an exception if the input does not match the format



```
add Fang 3
add Yu 5
add NCCU 2
add UCSB 1
add Management 4
add Information 5
find NTU
find Manager
```

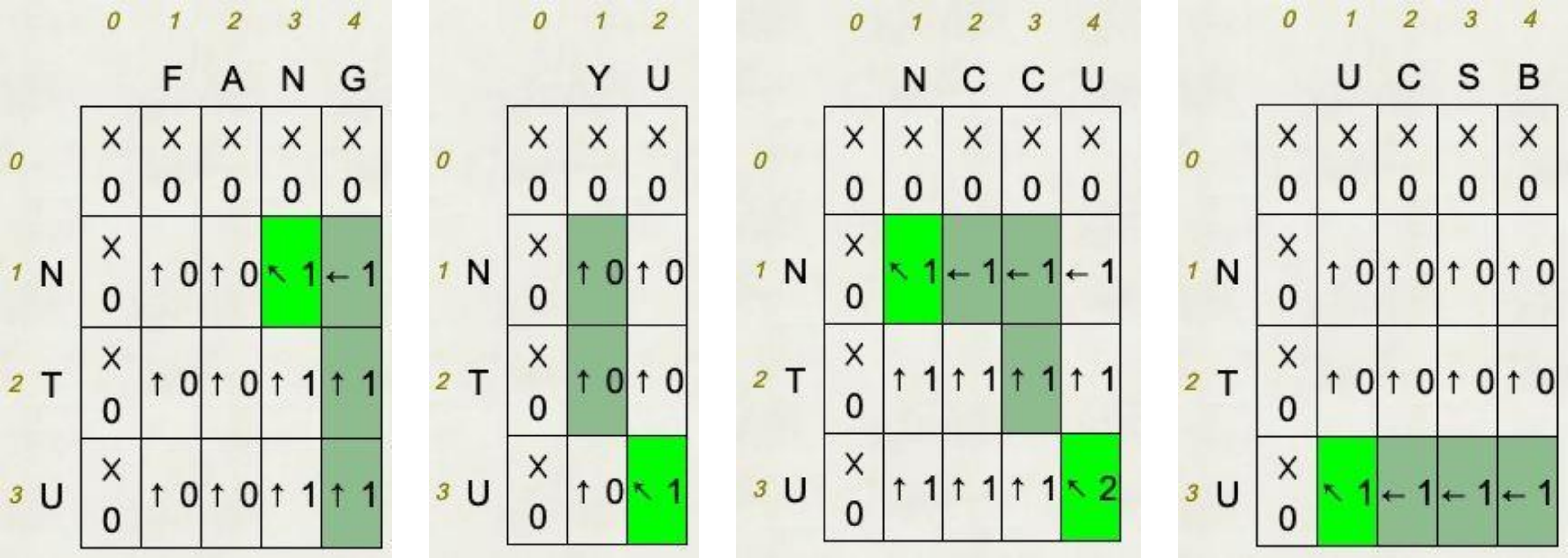
LCS



An LCS Algorithm

```
**Algorithm** LCS(X,Y ):
**Input:**    Strings X and Y with n and m elements, respectively
**Output:** For i = 0,…,n-1, j = 0,...,m-1, the length L[i, j] of a longest string
            that is a subsequence of both the string X[0..i] = $x_0x_1x_2…x_i$ and
            the string Y [0.. j] = $y_0y_1y_2…y_j$
**for** i =0 to n-1 **do**
    L[i,-1] = 0
**for** j =0 to m-1 **do**
    L[-1,j] = 0
**for** i =0 to n-1 **do**
    **for** j =0 to m-1 **do**
        **if** $x_i = y_j$ **then**
            L[i, j] = L[i-1, j-1] + 1
        **else**
            L[i, j] = max{L[i-1, j] , L[i, j-1]}
**return** array L
```

LCS



		0	1	2	3	4
			F	A	N	G
0		X 0	X 0	X 0	X 0	X 0
1	N	X 0	↑ 0	↑ 0	↖ 1	← 1
2	T	X 0	↑ 0	↑ 0	↑ 1	↑ 1
3	U	X 0	↑ 0	↑ 0	↑ 1	↑ 1

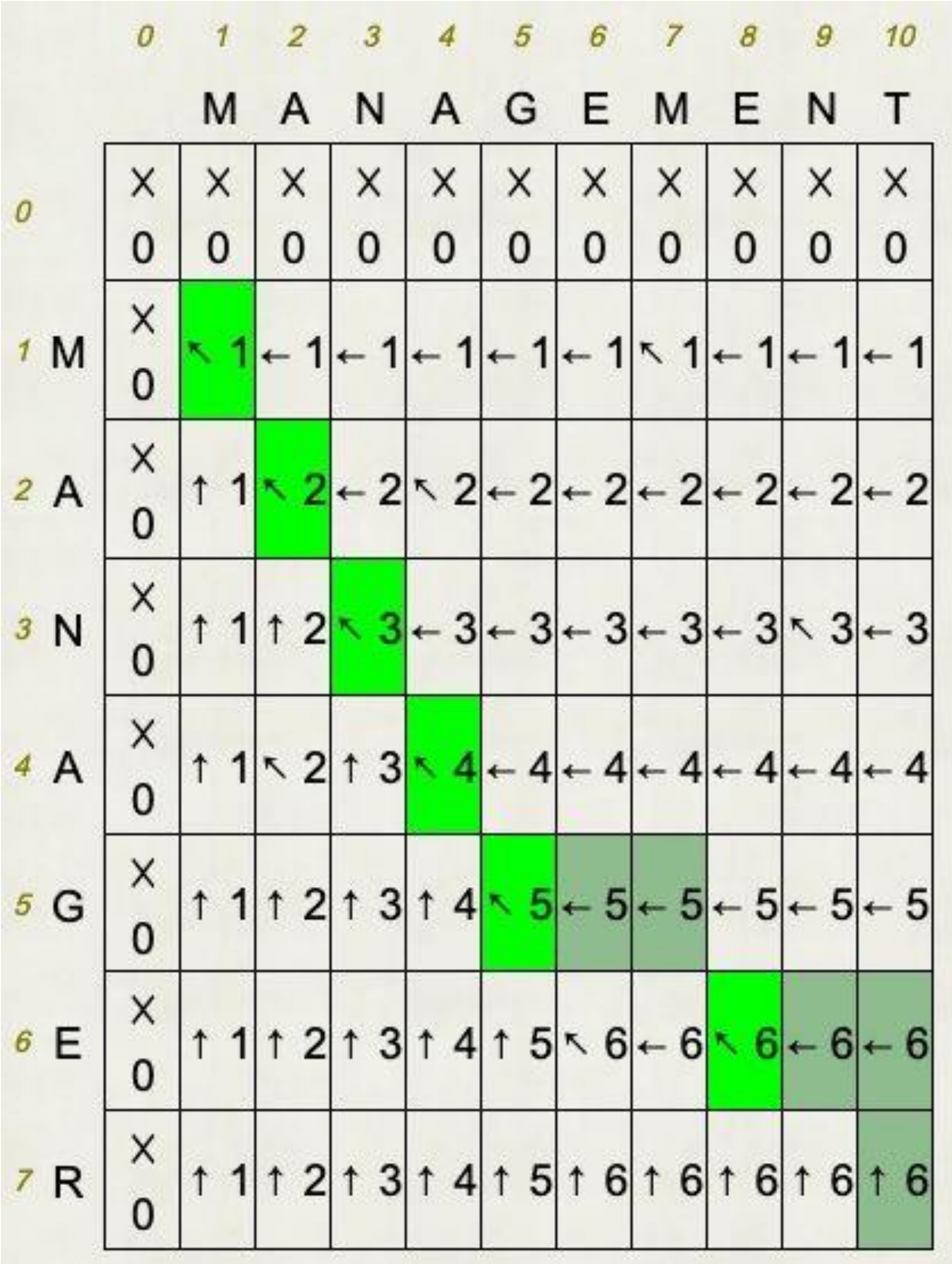
		0	1	2
			Y	U
0		X 0	X 0	X 0
1	N	X 0	↑ 0	↑ 0
2	T	X 0	↑ 0	↑ 0
3	U	X 0	↑ 0	↖ 1

		0	1	2	3	4
			N	C	C	U
0		X 0	X 0	X 0	X 0	X 0
1	N	X 0	↖ 1	← 1	← 1	← 1
2	T	X 0	↑ 1	↑ 1	↑ 1	↑ 1
3	U	X 0	↑ 1	↑ 1	↑ 1	↖ 2

		0	1	2	3	4
			U	C	S	B
0		X 0	X 0	X 0	X 0	X 0
1	N	X 0	↑ 0	↑ 0	↑ 0	↑ 0
2	T	X 0	↑ 0	↑ 0	↑ 0	↑ 0
3	U	X 0	↖ 1	← 1	← 1	← 1

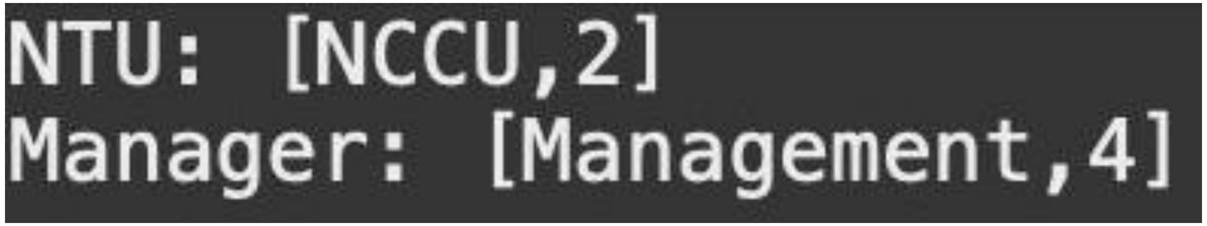
From https://web.ntnu.edu.tw/~algo/Subsequence2.html

LCS



		0	1	2	3	4	5	6	7	8	9	10
			M	A	N	A	G	E	M	E	N	T
0		X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0	X 0
1	M	X 0	↖ 1	← 1	← 1	← 1	← 1	← 1	↖ 1	← 1	← 1	← 1
2	A	X 0	↑ 1	↖ 2	← 2	↖ 2	← 2	← 2	← 2	← 2	← 2	← 2
3	N	X 0	↑ 1	↑ 2	↖ 3	← 3	← 3	← 3	← 3	← 3	↖ 3	← 3
4	A	X 0	↑ 1	↖ 2	↑ 3	↖ 4	← 4	← 4	← 4	← 4	← 4	← 4
5	G	X 0	↑ 1	↑ 2	↑ 3	↑ 4	↖ 5	← 5	← 5	← 5	← 5	← 5
6	E	X 0	↑ 1	↑ 2	↑ 3	↑ 4	↑ 5	↖ 6	← 6	↖ 6	← 6	← 6
7	R	X 0	↑ 1	↑ 2	↑ 3	↑ 4	↑ 5	↑ 6	↑ 6	↑ 6	↑ 6	↑ 6

Output

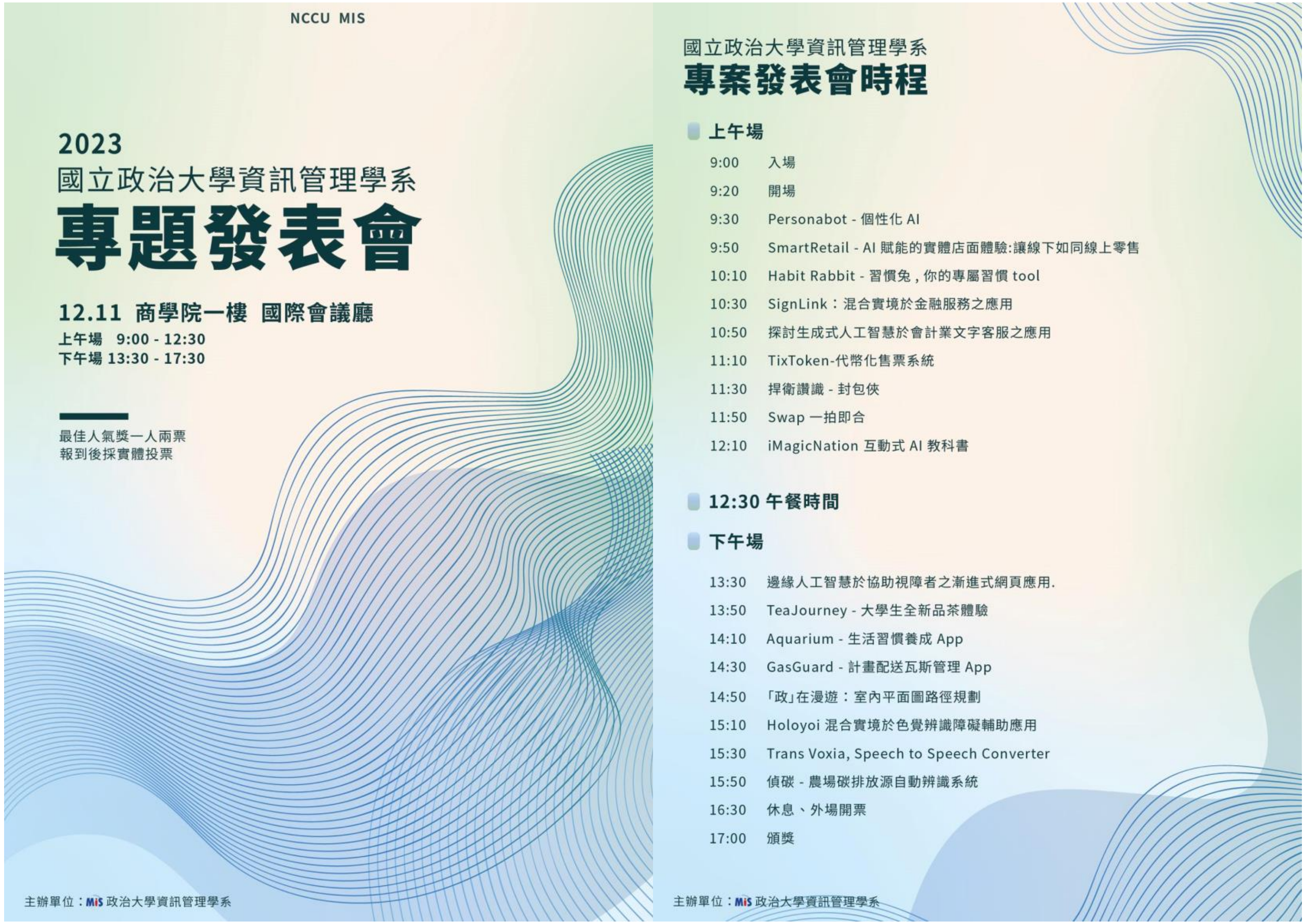


```
NTU: [NCCU,2]
Manager: [Management,4]
```

Bonus HW

- Write the reflection on 12/11 資管專題發表會
- File Name: HWBonus_{IDnumber}.pdf

  ex:HWBonus_111306XXX.pdf



NCCU MIS

2023
國立政治大學資訊管理學系
專題發表會

12.11 商學院一樓 國際會議廳

上午場 9:00 - 12:30
下午場 13:30 - 17:30

最佳人氣獎一人兩票
報到後採實體投票

主辦單位：MIS 政治大學資訊管理學系

國立政治大學資訊管理學系
專案發表會時程

上午場

9:00	入場
9:20	開場
9:30	Personabot - 個性化 AI
9:50	SmartRetail - AI 賦能的實體店面體驗:讓線下如同線上零售
10:10	Habit Rabbit - 習慣兔 , 你的專屬習慣 tool
10:30	SignLink：混合實境於金融服務之應用
10:50	探討生成式人工智慧於會計業文字客服之應用
11:10	TixToken-代幣化售票系統
11:30	捍衛讀識 - 封包俠
11:50	Swap 一拍即合
12:10	iMagicNation 互動式 AI 教科書

12:30 午餐時間

下午場

13:30	邊緣人工智慧於協助視障者之漸進式網頁應用.
13:50	TeaJourney - 大學生全新品茶體驗
14:10	Aquarium - 生活習慣養成 App
14:30	GasGuard - 計畫配送瓦斯管理 App
14:50	「政」在漫遊：室內平面圖路徑規劃
15:10	Holoyoi 混合實境於色覺辨識障礙輔助應用
15:30	Trans Voxia, Speech to Speech Converter
15:50	偵碳 - 農場碳排放源自動辨識系統
16:30	休息、外場開票
17:00	頒獎

主辦單位：MIS 政治大學資訊管理學系

Notice

- Remind to send your GitHub link and contact information via Google form

  https://forms.gle/p8g6rXU7NmDTGKLi6

- Keep maintaining your GitHub!
- The make-up section in WM5 will open soon, only can get 4 out of 5 for late homework. The group that didn’t upload the proposal to WM5 should also hand-in in the make-up section.