

Tutorial 2

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Specification clarification

End-of-line symbol

- For *candidate.txt* and *instructor.txt*:

Each line is ended with “\r\n” (CRLF), including the last line.

- For *output.txt*:

Each line is ended with “\n” (LF), including the last line.

Candidates.txt

	Golang	Cantonese	Guitar	3150	3180	1110	CRLF
	Cantonese	Table-tennis	Football	3320	2110	3180	CRLF
...	Japanese	Table-tennis	Football	2110	3180	3320	CRLF
	Assembly	Linux	Shell script	1020	3150	2102	CRLF
	Cantonese	Table-tennis	Football	3180	3320	1110	CRLF
	Cantonese	Rust	Football	3180	3150	1020	CRLF

output.txt

```
1020 1155134624 1155147332 0000000000 LF
1110 0000000000 0000000000 0000000000 LF
3150 1155132102 1155134624 0000000000 LF
3180 1155136773 1155134022 1155134206 LF
```

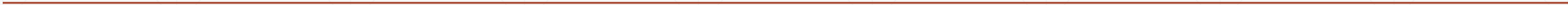
You can use notepad++
to display the EOL

Specification clarification

Skill names

- Each skill name is a 15-character string.
 - Spaces may be added to fill all 15 characters
 - My contain spaces between words
 - All 15 characters can be spaces, and you should treat it as a normal skill name
 - All 15 characters can be non-spaces

Shell_script_



Specification clarification

Duplications ?

- A course won't specify duplicated skills
 - A candidate won't have duplicated skills
 - No duplicate course in instructor.txt
 - No duplicate TA in candidate.txt
 - A candidate may be Top-3 for multiple courses
-

Specification clarification

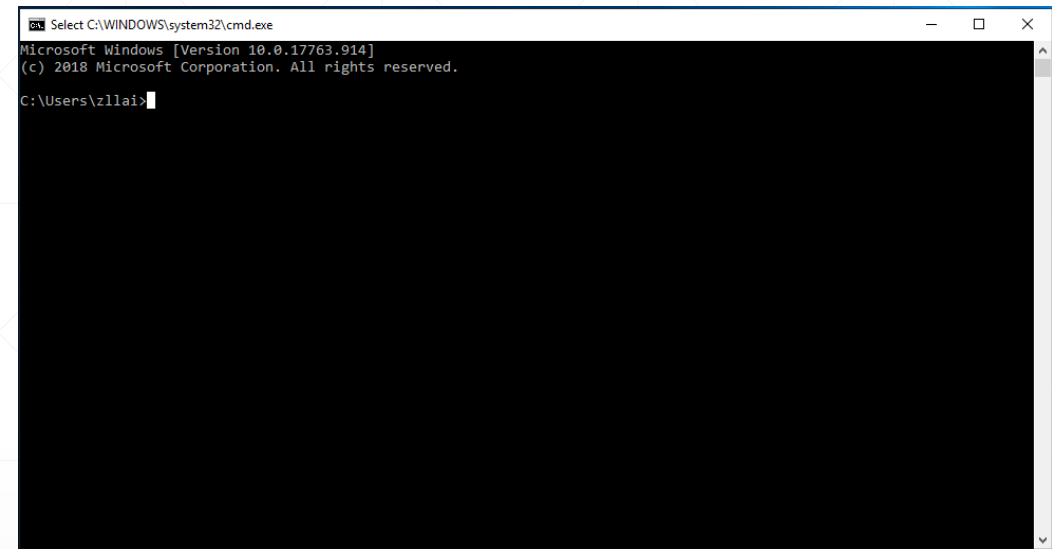
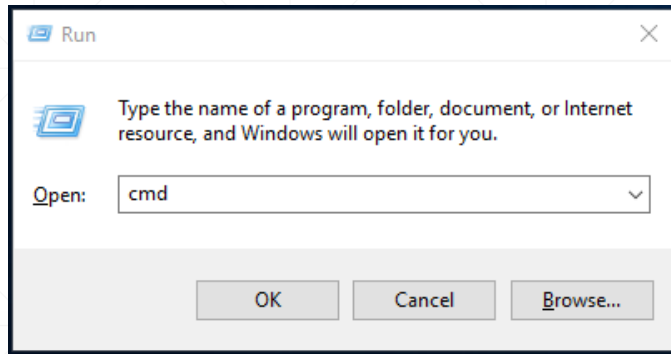
Error handling

- If file does not exist, display “non-existing file!”, and terminate.
→ so “non-existing file!” cannot be displayed twice
 - Think about other errors that may happen!
-

Lab environment setup

Make sure your program is compliable on windows machines at SHB904/924 !

1. Press “start + r”
2. Enter “cmd”



3. Setup COBOL environment by entering:

S:\OpenCOBOL\set_env.bat

Lab environment setup

To compile:

- COBOL:

```
cobc -x ta_ranking.cob
```

- C:

```
S:\Cygwin\bin\gcc ta_ranking.c -o ta_ranking
```

Install COBOL compiler and GCC on your laptop

Note: this cannot replace windows machines at SHB904/924 !

1. Download installation package from course website
2. Unzip the package
3. Open a windows command line
4. cd to where you the package is unzipped.
5. Run:

```
set_env.bat
```

6. Test whether it is installed:

```
cobc --version
```

```
D:\gcc_cobol>cobc --version
cobc (OpenCOBOL) 1.1.0
Copyright (C) 2001-2009 Keisuke Nishida / Roger While
Built    Sep 10 2010 10:12:33
Packaged Feb 06 2009 10:30:55 CET
```

```
gcc --version
```

```
D:\gcc_cobol>gcc --version
2.95.2
```

Some details about COBOL

How to check if file exists?

ENVIRONMENT DIVISION.

INPUT-OUTPUT SECTION.

FILE-CONTROL.

SELECT OPTIONAL INSTRUCTOR-FILE ASSIGN TO 'instructors.txt'

ORGANIZATION IS LINE SEQUENTIAL

FILE STATUS IS INSTRUCTOR-FILE-STATUS.

So that your program won't "crash" if file does not exist

After "OPEN INSTRUCTOR-FILE",
This variables contains status of the file.

Some details about COBOL

COBOL file status table

00	Successful completion
02	Indexed files only.
04	Read record length mis-match.
05	The referenced optional file does not exist.
06	Attempted to write to a file that has been opened for input.
07	Referenced file is not a tape device.
08	Attempted to read from a file opened for output
....	

See more at: <http://ibmmainframes.com/references/a27.html>

Some details about COBOL

How to check end-of-file ?

1. Method 1: check file status.

2. Method 2:


```
READ INPUT-FILE  
  AT END  
    DISPLAY 'End of File'  
  NOT AT END  
    DISPLAY 'Read a line'  
END-READ.
```

Some details about COBOL

Trailing space is missing?

output.txt

```
1020 1155134624 1155147332 0000000000 LE
1110 0000000000 0000000000 0000000000 LE
3150 1155132102 1155134624 0000000000 LE
3180 1155136773 1155134022 1155134206 LE
```



Need to have a space after each TA ID.

- Some version of COBOL automatically eliminates trailing spaces
- Solution:

Environment
division

```
SELECT OUTPUT-FILE ASSIGN TO 'output.txt'
      ORGANIZATION IS BINARY SEQUENTIAL.
```

Data
division

```
FD OUTPUT-FILE.
  01 RANK-RESULT.
    03 R-COURSE-ID PIC X(5) .
    03 RANK-1 PIC X(11) .
    03 RANK-2 PIC X(11) .
    03 RANK-3 PIC X(11) .
    03 EOL PIC X.
```

Before you write to file

```
MOVE x'0a' to EOL.
```

Some hints of assignment 1

Store information of candidates in a big array?

- No need.
- You can read candidates.txt multiple times.

How do I restart reading a file from the first line in COBOL?

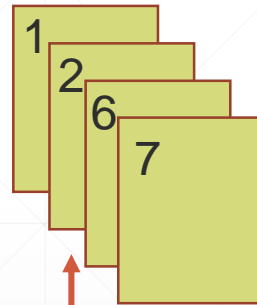
- Close the file and re-open it.
-

Some hints of assignment 1

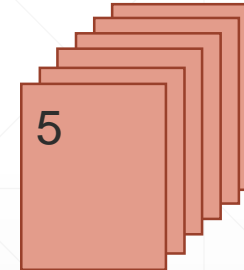
How to rank TAs?

- Consider insertion sort:

Sorted deck
(initially empty)



Unsorted deck
(initially all cards)



insert

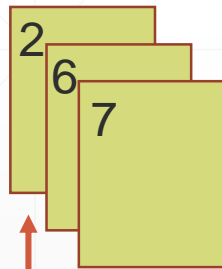
Problem: how can I do insertion sort without storing all candidates in a big array?

Some hints of assignment 1

How to rank TAs?

- Remember you only need to output top-3 TAs.
- Consider you can only hold at most 3 cards on the left hand side...

Sorted deck
(initially empty)



insert

Unsorted deck
(initially all cards)

