Exam	-	Python	The time usually taken:	4	hours

Technical skill check exam (MessageTree)

The aim of this assignment

To evaluate technical skill, especially logic consideration, correctness, maintainable coding skill, etc.

Required results

Submit the following items:
- Python project of the following application.
- Test cases (Excel file)

1 Summary

Create a application which loads CSV file including message information, and output them in a tree like bullet-in board.
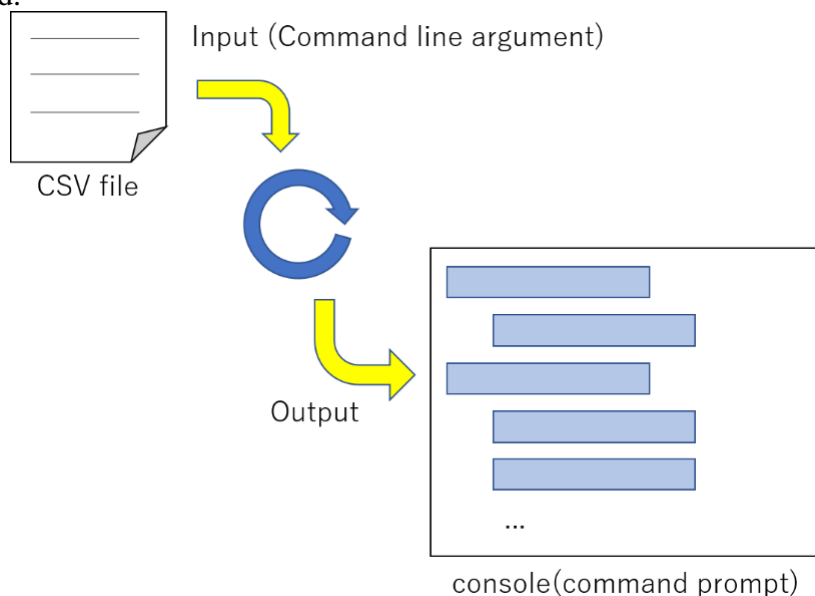

Figure 1 Overview

Example:

```
> python MessageTree.py testData\02_parent_child_small.csv
2020-01-12 12:10:12 [Alice] Today I attended Math class.
    2020-01-12 18:27:30 [Charlie] I missed that class...
2020-01-12 12:13:00 [Bob] Today I am absent because of sickness.
    2020-01-12 23:00:18 [Alice] Take care.
    2020-01-14 11:31:51 [David] You are absent today also. Are you OK?
```

- Each message can have "parent message"
- A message which does not have "parent" will be displayed at the top of line. On the other hand, a message which has "parent" will be displayed below parent line with indent (4 spaces).
- CSV file path will be set as command-line argument.

1.1 Exam Rule

1. <u>You can use the Internet</u>, but of course, you <u>must not communicate with others.</u>
2. You need to use <u>pycodestyle</u> so that your source code should not include any error of pycodestyle.
3. Some test CSV file is provided, so you can use them for behavior checking.
4. You don't need to consider the case that some parent has also parent (in another words, <u>no need to care "grand parent"</u>).
5. Every "child" message should follow "parent" message in CSV file. You don't need to consider the other case.
6. You need to create <u>test case(unittest) of this application</u> which passes correctly.

2 Detail of functions

2.1 CSV file

Here shows the format of CSV file to be loaded.

Table 1 CSV fields

No.	item	format	contents
1	ID	integer, unique in CSV file	The ID of message
2	parent ID	empty, or integer	The Id of parent message. Empty means that the message does not have parent.
3	datetime	"YYYY-MM-DD HH:mm:ss" (space between "DD" and "HH")	The date and time of message registration
4	author	string (without comma)	the name of person who post message
5	message	string (without comma)	message

● CSV file should not have header.
● If some line are blank or some line does not follow the format above, application should abort. Refer " 2.3 Error handling ".

Example of CSV file:
```
1,,2020-01-12 12:10:12,Alice,Today I attended Math class.
2,1,2020-01-12 18:27:30,Charlie,I missed that class...
3,,2020-01-12 12:13:00,Bob,Today I am absent because of sickness.
4,3,2020-01-12 23:00:18,Alice,Too bad. Take care.
5,3,2020-01-14 11:31:51,David,You are absent today also. Are you OK?
```

2.2 Output

The output format of each message should be the following:
<date> [<author>] <message>
* There should be a space between "date" and "author", between "author" and "message".

Each line has only one message.

Child messages should be under each parent messages, and each child message has indent of 4 more spaces than that of parent message.

Example of output

```
2020-01-12 12:10:37 [Alice] Today I attended Math class.
    2020-01-12 18:27:44 [Charlie] I missed that class... Can you share
me what you learned?
    2020-01-15 04:13:25 [Bob] Me too.
2020-01-12 23:00:04 [David] Oh! Is Math class today? I totally forgot...
2020-01-14 11:31:14 [Eve] Attended.
    2020-01-14 12:18:42 [Alice] Long time no see!!
    2020-01-14 15:51:08 [Bob] We are wating for you.
    2020-01-14 15:52:39 [Charlie] I'm pleased that you looks fine.
    2020-01-15 20:01:11 [Frank] It's nice to meet you. This is first
time to meet you. Right?
2020-01-14 15:12:04 [Frank] Attended. It is my first class to attend.
```

2.3 Error handling

If error occurs, this application should take the following action.

Table 2 Error handlings

No.	condition	console message	Action after error
1	No argument	No file name is input.	Program will be aborted immediately.
2	Specified file does not exist	File "<file name>" is not found.	Program will be aborted immediately.
3	Wrong format of CSV file (e.g. wrong amount of items, format error of item, etc.)	File "<file name>" format is not correct. line: <error line number>	Program will be aborted immediately.
4	Parent message does not exist.	Parent message is not found. Target message ID: <ID> , parent message ID: <parentID>	Program will be aborted immediately.
5	Other error occurs (if exists)	An error occurred. <stack trace>	Program will be aborted immediately.

3 Example

```
> python MessageTree.py testData\02_parent_child_small.csv

2020-01-12 12:10:12 [Alice] Today I attended Math class.
    2020-01-12 18:27:30 [Charlie] I missed that class...
2020-01-12 12:13:00 [Bob] Today I am absent because of sickness.
    2020-01-12 23:00:18 [Alice] Take care.
    2020-01-14 11:31:51 [David] You are absent today also. Are you OK?


> python MessageTree.py testData\03_parent_child_big.csv

2020-01-12 12:10:37 [Alice] Today I attended Math class.
    2020-01-12 18:27:44 [Charlie] I missed that class... Can you share
me what you learned?
    2020-01-15 04:13:25 [Bob] Me too.
2020-01-12 23:00:04 [David] Oh! Is Math class today? I totally forgot...
2020-01-14 11:31:14 [Eve] Attended.
    2020-01-14 12:18:42 [Alice] Long time no see!!
    2020-01-14 15:51:08 [Bob] We are wating for you.
    2020-01-14 15:52:39 [Charlie] I'm pleased that you looks fine.
    2020-01-15 20:01:11 [Frank] It's nice to meet you. This is first
time to meet you. Right?
2020-01-14 15:12:04 [Frank] Attended. It is my first class to attend.


> python MessageTree.py testData\11_less_element.csv
File "testData\11_less_element.csv" format is not correct. line:3


> python MessageTree.py testData\16_not_exist_parent.csv
Parent message is not found. Target message ID: 5, parent message ID: 4
```

That is all for the exercise explanation