

3 A text file `OldFile.txt` contains IDs, names and email addresses for members of a club. Three information items are stored for each member and each item is stored on a separate line.

The example shows the information for the first two members in the first six lines of the file:

Line in file	Information item	Example data
1	member 1 ID	"AB1234"
2	member 1 name	"Freddie Jones"
3	member 1 email address	"FreddieJ909@Cambridge.org"
4	member 2 ID	"BC2345"
5	member 2 name	"Sue Smith"
6	member 2 email address	"Sue1024@Cambridge.org"

The member ID string is always two letters followed by four digits.

The file design is to be changed so that information for each user is stored as a single line of the file, with the character `'\'` used as a separator between data items.

For example, the single line for member 1 will be:

`"AB1234\Freddie Jones\FreddieJ909@Cambridge.org"`

An algorithm will produce a new file `NewFile.txt` from the contents of `OldFile.txt`

Assume:

- `LineX`, `LineY` and `LineZ` are of type `STRING` and are used to store the three items of information for each member
- `NewString` is a temporary variable of type `STRING`
- `OldFile.txt` exists and contains valid data.

(a) The algorithm to create the new file is expressed in steps.

Complete the following numbered steps:

- Step 1 : open the file in
- Step 2 : open the file in
- Step 3 : read a line from and store in
- Step 4 : read a line from and store in
- Step 5 : read a line from and store in
- Step 6 : set `NewString` to
- Step 7 : write `NewString` to
- Step 8 : repeat from step until
- Step 9 : close both files.

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(b) The character `'\'` has been chosen as a separator.

Explain why this is a suitable character.

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(c) Two new information items are to be stored for each member. Both new items are encrypted; they can each contain any character (including `'\'`) and can be of any length up to a maximum of 99 characters.

For example:

Information item	Example data
member 1 ID	"AB1234"
member 1 name	"Freddie Jones"
member 1 email address	"FreddieJ909@Cambridge.org"
member 1 new information 1	"En/98&*(?\ /D7iP"
member 1 new information 2	"23\CoboL"

Explain the additional file design changes needed so that:

- all the information items for each member are stored on a single line of `NewFile.txt`
- it is possible to extract each information item after the line is read.

Assume the `'\'` character is not used in any email address.

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