

4.3.2 File Processing

May/June 2012. P21/22

1 Anna wants to find out about her fellow students' reading habits. It will be part of her Literature coursework.

She will ask questions online, so starts by designing a screen layout. The first four questions will ask for:

- student's first name
- date of birth
- type of book they prefer (printed, audio-book or e-book)
- whether student reads novels (yes/no)

(f) The records will be held in a serial file.

Give three statements from a high-level language that may be used for the file handling and explain what each does.

[6]

May/June 2012. P23

1 Anna wants to find out about her fellow students' sporting activities. It will be part of her Sports Studies coursework.

She will ask questions online, so starts by designing a screen layout. The first four questions will ask for:

- student's first name
- age (16,17,18 or 19)
- favourite sport
- whether student is a member of a sports club (yes/no)

(f) The records will be held in a direct access file.

Give four statements from a high-level programming language that may be used for the file handling and explain what each does.

[8]

Oct/Nov 2014.P21/P22

2 Ali sets up user IDs and passwords for his program.

When the user types in their user ID, the program looks up the stored password for this user ID.

The stored password is the encrypted version of the user's password.

(b) Ali uses a sequential file of records to store the user IDs and encrypted passwords.

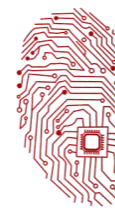
When a user types in their User ID, the program calls a function, `FindPassword`, with parameter `ThisUserID`.

The function searches each record in the file for `ThisUserID` and returns the encrypted password.

If `ThisUserID` is not stored in the file, the function returns an error code.

Complete the pseudocode:





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```
FUNCTION FindPassword(ThisUserID : STRING) RETURNS .....
  DECLARE Found : BOOLEAN
  OPENFILE FOR INPUT // for reading
  Found ← FALSE
  WHILE .....
    FILEREAD next record
    IF .....
      THEN
        .....
      ENDIF
    ENDWHILE
  IF .....
    THEN
      .....
    ELSE
      .....
    ENDIF
  CLOSEFILE
ENDFUNCTION
```

[8]

Computer Science (9608)

Oct/Nov 2015.P41/P43

5 Data about sports club members are stored in a random file of records.

- The key field of a member record is the member ID (range 1000 to 9999).
- Other member data are stored.
- A hashing function is used to calculate a record address.
- The random file initially consists of dummy records.
- Dummy records are shown by member ID set to 0.

```
FUNCTION Hash(MemberID : INTEGER) RETURNS INTEGER
  Address ← MemberID MOD 100
  RETURN Address
ENDFUNCTION
```

(a) New members with the following member IDs have joined the sports club:
1001, 3005, 4096, 2098, 7002

Indicate where each record should be stored by deleting the zero and writing the member ID in the correct cell.





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| MembershipFile | | |
|----------------|----------|-------------------|
| Address | MemberID | Other member data |
| 0 | 0 | |
| 1 | 0 | |
| 2 | 0 | |
| 3 | 0 | |
| 4 | 0 | |
| 5 | 0 | |
| 6 | 0 | |
| 7 | 0 | |
| 8 | 0 | |
| ⋮ | ⋮ | ⋮ |
| 96 | 0 | |
| 97 | 0 | |
| 98 | 0 | |
| 99 | 0 | |

[2]

(b) (i) The program stores a new member's data in the record variable `NewMember`. The field `MemberID` stores the member ID.

Complete the pseudocode:

```

10 // generate record address
20 NewAddress ← .....
30 // move pointer to the disk address for the record
40 SEEK .....
50 PUTRECORD "MembershipFile", ..... [4]
    
```

(iii) A record with member ID 9001 is to be stored.

Explain the problem that occurs when this record is saved. [2]

(iv) Describe a method, without changing the function `Hash`, to handle the problem identified in **part (b)(iii)**. [2]

(v) Write **pseudocode** to implement the method you described in **part (b)(iv)**. Choose line numbers to indicate where your pseudocode should be inserted in the pseudocode of **part (b)(i)**. [4]

Oct/Nov 2015.P42

6 A company keeps details of its stock items in a file of records, `StockFile`.

(c) A stock report program uses a variable of type `StockItem` declared as follows:

```
DECLARE ThisStockItem : Stockitem
```

The program reads each record in the file `StockFile` in turn.

The program outputs the fields `ProductCode` and `NumberInStock` for each record.

Write **pseudocode** for this. [4]