Ch26

File Processing and Exception Handling

CHAPTER ASSIGNMENT · 42 MARKS

Name _____ Class _____ No. _____ Date _____

Answer every question in the space given. Show your working. You may use the chapter page to help you.

Questions from *Computer Science for Cambridge International AS & A Level Coursebook*, 2nd edition, Sylvia Langfield and Dave Duddell (Cambridge University Press), for classroom use.

Tasks and questions from the chapter

T26.01 **Task 26.01:**

(a) Write a complete program to save several car records to a sequential file.

(b) Write another program to read the file and display the contents on screen.

T26.02 **Task 26.02:** Write a complete program to save several car records to a random-access file. Write another program to find a record in the random-access file using the record key. Display the record data on screen.

T26.03 **Task 26.03:** Add exception-handling code to your programs for Task 26.01 or Task 26.02. Test your code handles exceptions without the program crashing.

RP **Reflection Point:** Can you explain the difference between serial, sequential and random access files? Give an example of when each is appropriate.

Exam-style questions

1 A company stores details about their customers in a binary file of records.

- The key field of a customer record is the customer ID (a number between 100001 and 999999).
- The name of the customer is stored in a 30-character field.
- The customer's telephone number is stored in a 14-character field.
- The total value of orders so far is stored in a currency (decimal) field.

(i) Write the declaration statement for the record data type `CustomerRecord` required to store the data. Write program code. [6]

(ii) Write the declaration statement for an array `CustomerData[0 : 999]` to store customer records. [2]

(b) The array `CustomerData` is to be used as a hash table to store customer records. The function `Hash` is used to calculate the address where a record is to be stored.

```
FUNCTION Hash(CustomerID : INTEGER) RETURNS INTEGER
   Address <- CustomerID MOD 1000
   RETURN Address
ENDFUNCTION
```

(i) Write program code to implement the function `Hash`. [3]

(ii) Write a procedure `AddRecord(Customer : CustomerRecord)` to add a customer record to the hash table `CustomerData`. Your solution should handle collisions by using the next available slot in the hash table. [7]

(iii) Write a function `FindRecord(CustomerID : INTEGER)` that returns the index of the hash table slot where the record for the customer with `CustomerID` is stored. [7]

(c) Before the program stops, the hash table records must be stored in a sequential file, so that the records can be restored to the array when the program is re-entered. Write program code to store the records of the array `CustomerData` sequentially into a binary file `CustomerData.DAT`. [6]

(d) Instead of using a hash table, the company decide they want to store customer records in a direct-access binary file. Explain what changes need to be made to your program to do this. [6]

2 A program allows a user to enter a filename for accessing a data file. If the user types in a filename that does not exist, the program crashes. Write program code that includes exception handling to replace the following pseudocode: [5]

```
OUTPUT "Which file do you want to use? "
INPUT FileName
OPENFILE FileName FOR RANDOM
```

End of assignment · Check your answers against the chapter at gurujazzy.com/subjects/computer-science/as-a-level/file-processing-exceptions/