

3. TFILE is a text file. Each line of TFILE contains exactly 20 characters. Each of the characters in TFILE is either an English letter ('a', 'b', ..., 'z', 'A', 'B', ..., 'Z') or a colon(':'). In each line of TFILE, the starting and ending characters are English letters.

In TFILE, a *word* refers to a string of English letters, separated by colon(s). For example, the following line of TFILE contains 4 *words*:

AbcDE:dcBA:::AB::::A

Kevin wants to write a Pascal program which prints the *words* of TFILE in separate lines. For example, if TIFLE consists of the following lines:

AbcDE:dcBA:::AB::::A
SHE:IS:::YESTERADY:B
NOW:::ABCDE::SCHOOLS

Then the program outputs the following lines:

AbcDE
dcBA
AB
A
SHE
IS
YESTERDAY
B
NOW
ABCDE
SCHOOLS

- (a) Write a procedure which takes a character and checks whether it is an English letter. The procedure returns the Boolean constant TRUE if the character is an English letter and returns FALSE if otherwise. You should use the following lines for your procedure:

```
procedure ValidChar(Localch: char; var Err:Boolean);
```

(5 marks)

- (b) Write a procedure which takes a line of text (which is a character array of 20 characters) and prints the *words* found in it in separate lines. You should use the following lines for your procedure: (You may make use of the procedure ValidChar in (a) and assume that CArray has been declared to be 'array[1..20] of char'.)

```
procedure Pwords (Var Line:CArray);  
var K : integer;  
    Fg, Er : Boolean
```

(Note: K is a variable used as a control variable for looping; Fg is a variable used as a flag; Er is variable used to get the result from ValidChar.)

(10 marks)

By using ValidChar and Pwords in (a) and (b) above, Kevin is able to complete his program without much difficulty. Thus Kevin has written the following lines:

```
Program KevinProgram;  
Type CArray=array[1..20] of char;  
Var Infile: text;  
    Tline : CArray;  
    Fname : string;  
    Count : integer;  
  
Procedure ValidChar(Localch: char; var Err:Boolean);  
  
Procedure Pwords(var Line:CArray);  
Var K: integer;  
    Fg, Er : Boolean;  
  
Begin  
.....  
end.
```

Kevin's program requires the use of the following variables:

variable	Use
InFile	To store the input text file
Tline	To store a line of text from the text file
Fname	To store the filename of the input text file
Count	Looping control

- (c) Complete Kevin's program by writing its main program. The program should read the characters from the text file into `TLine` one at a time. The program should produce the output below on the VDU. (In this output, all the information following the question marks is entered through the keyboard by the user. All other items are output from the program.)

```
Name of text file? TFILE
```

```
Words in the file are:
```

```
AbcDE
```

```
dcBA
```

```
...
```

```
...
```

(10 marks)

4. (Note: In this question, you will be awarded up to 4 marks for effective communication.)

John is a university student. He has bought a notebook computer to help with his studies.

A program called NTS is installed in John's computer. NTS maintains a database called STUDY which is of the following structure:

Field	Field Name	Field Type	Field width	Contents
1	DATE	Date	8	Date
2	SUBJECT	Character	10	Subject name
3	TOPIC	Character	20	Topic name
4	FNAME	Character	8	File name of notes
5	TYPE	Character	1	L=lecture, B=reading in library T=tutorial H=studying at home
6	NAME	Character	50	Name of teacher or name of book

Whenever John pursues his studies (whether he is attending a lecture, discussing in a tutorial class, reading books in the library, or studying at home), he runs the program NTS. NTS starts by opening STUDY, adding a new blank record, and prompting John to enter appropriate information in the new record. For example, in a lecture on rocks given by John's geography teacher Professor Wash on 21 Nov 92, the following information was entered in the new record:

DATE: 21/11/97
SUBJECT: geog
TOPIC: rock
FNAME: GEOGROCK
TYPE: L
NAME: Prof Wash

After entering the appropriate information. NTS will invoke a text editor (i.e. a primitive word processor which handles text only) to open the text file whose name equals the name given by FNAME. If no such file is found, the text editor will create a new text file with that name.

John will then record notes in the text file.

Besides NTS, John has also installed in his computer a word processing package and a communication package.

- (a) Given **one** advantage of using a notebook computer instead of a desktop computer. (2 marks)

- (b) Suppose on 22 Dec 97 John started reading a psychology book called 'How to Study Effectively' in the university library. As usual, John ran NTS and a new record was added to STUDY. Suggested appropriate contents for the fields in the new record.

New record:

DATE	
SUBJECT	
TOPIC	
FNAME	
TYPE	
NAME	

(4 marks)

- (c) NTS also help John to write essays. Suppose John has to write an essay on rocks as one of his geography assignments. By carrying out a few file operations, NTS is able to produce a text file which contains all the geography notes on rocks stored in different files.

- (i) Name **two** types of file operations that NTS has to carry out to produce the text file containing all geography notes on rocks. What information should John input for the above operation?

- (ii) Describe how John should make use of his computer to finish his essay on rocks.

- (d) Being a student of the university, John is able to do the following things at home:

A1: login the computer system of the university library;

A2: send and receive e-mail with his tutors through the university mainframe computer.

- (i) Give **one** reason why the ability to do A1 helps John save much time in his study.
(ii) Give **one** advantage and **one** disadvantage of using e-mail instead of traditional mail for communication.

(4 marks)

- (e) John is an ambitious student. He takes an advanced course called 'geography Research Projects'. In this course, he is required to read many reference books, do research using many statistical tools, and present his work to class from time to time.

Besides the software packages that are already installed in his computer, name *two* application software packages that you think John would find helpful. For each package mentioned, briefly explain how John might make use of it in his advanced course.

(4 marks)

End of Paper