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Problem Set 2

OUT: 25 SEPTEMBER, 1992
DUE: 2 OCTOBER, 1992

Reading Assignment

Read

- Chapter 1;
- Chapter 2, Sections "Arrays", "Records" and "Files";
- Chapter 3, Sections "Preliminaries" and "Programming with Linked Lists".

Goals

Practice using pointers, linked lists and text files.

Assignment

Write and fully test a program that reads the text file *datafile.dat* and places each word in a separate entry of a linked list. Once read, write the linked list to the terminal. While reading *datafile.dat*, add new words to the list at its head. In this way, when you write the list, the text file appears with the words in reverse order.

I will give you a hint by writing the type definitions you should use.

```
const
  StringMax = 25 ;
type
  StringArray = array [1..StringMax] of char ;
  StringType = record
               str : StringArray ;
               len : integer
               end ;

  ListPntr = ^ListType ;
  ListType = record
```

```
    str : StringType ;
    cnt : integer ;
    next : ListPntr
  end
```

It is important to use subroutines to handle the creation and manipulation of data types. Your code's structure must be excellent to receive full credit. Among the subroutines you must include will be,

```
function read_string( var f : text ) : StringType ;
    {returns the next string in file f}
procedure write_string( s : StringType ) ;
    {writes the string s to the terminal}
function create_list : ListPntr ;
    {returns an empty list}
function insert_head_list( l : ListPntr;
    s : StringType; cnt : Integer ) : ListPntr ;
    {returns the new root pointer for the list l}
    {with a new element at its head.}
procedure list_list( l : ListPntr ) ;
    {writes the entire list l to the terminal}
```

Here are some helpful VMS hints. The file *login.com* contains definitions what might make your life easier. As the course progresses you will receive updates for this file including new abbreviations for commands. At this moment, the file defines the commands *home, cd* and *Rosenberg*. The command *home* will take you back to the directory you were in just after login. This is called your default or home directory. The command *cd* is short for *set def*. That is, you can now say *cd [.ps1]* instead of *set def [.ps1]*. The letters "cd" stand for "change directory". Finally, if you want to send me mail, you must use my login name "E0L47V07". If you forget this eight character string, the command *Rosenberg* will display it for you.