

CPSC 231 Final Exam Review: Fall 2006

Short answer questions

1. Write the code for the 'display' procedure for the movie tracker program from A8. You can assume that the list of movies has already been initialized with either some default starting values or the information has been read in from file. In the former case the list is empty and 'movieCount' is set to zero. In the latter case movieCount will be set to a value equal to the number of movies currently stored in the list. If the list is empty then the procedure should display some sort of status message e.g., "Collection is empty". Otherwise the procedure should display onscreen element-by-element each movie in the collection. Each field of each movie should be on its own separate line and each movie should be separated by a line of stars. Beyond that you don't have to worry about formatting the output. However: only occupied array elements should be displayed, empty elements should not appear.

```
program collection (input, output);
const
  MAX_MOVIES      = 100;
  MAX_CAST        = 3;
  NAME_LENGTH     = 80;
  GENRE_LENGTH    = 15;
  CAST_LENGTH     = 80;
type
  Movie = record
    name : string [NAME_LENGTH];
    cast  : array [1..MAX_CAST] of string [CAST_LENGTH];
    genre : string [GENRE_LENGTH];
    stars : integer;
  end; (* Declaration of record client *)
  MovieList = array [1..MAX_MOVIES] of Movie;
```

<< Write your answer here >>

```
begin
  (* Assume that the list has been declared, initialized and the proper procedure
  and/or function calls have been made *)
end.
```

2. What is the output of the following program?

program pointerExample (output);

type

CharPointer = ^char;

procedure proc1 (ptr1 : CharPointer;
var ptr2 : CharPointer);

begin

ptr1^ := 'A';

ptr2^ := 'B';

writeln(ptr1^, ' ', ptr2^);

end;

procedure proc2 (ptr1 : CharPointer;
var ptr2 : CharPointer);

var

temp : CharPointer;

begin

new(temp);

temp^ := '#';

ptr1 := temp;

new(temp);

temp^ := '*';

ptr2 := temp;

writeln(ptr1^, ' ', ptr2^);

end;

begin

var ptr1 : CharPointer;

var ptr2 : CharPointer;

new(ptr1);

new(ptr2);

ptr1^ := 'a';

ptr2^ := 'b';

writeln(ptr1^, ' ', ptr2^);

proc1(ptr1,ptr2);

writeln(ptr1^, ' ', ptr2^);

proc2(ptr1,ptr2);

writeln(ptr1^, ' ', ptr2^);

end.

<< **Write your answer here** >>

3. Write the code for a recursive module that will display the nodes of the list in order (from beginning to end) all on one line. You can assume the list has already been initialized with some starting values.

program list (output);

type

 NodePointer = ^Node;

 Node = record

 data : integer;

 next : NodePointer;

 end;

(* Somewhere here the list has been properly initialized *)

<< **Write your answer here** >>

<< **End of answer space** >>

begin

 var head : NodePointer;

 initialize(head);

 display(head);

end.

4. In the space provided below you are to indicate what will be the output of the following program.

```
program arrayExample (input, output);  
  
begin  
  var grid : array [1..3, 1..3] of integer;  
  var r    : integer;  
  var c    : integer;  
  
  for r := 1 to 3 do  
    begin  
      for c := 1 to 3 do  
        begin  
          grid[r][c] := c;  
        end  
      end  
    end;  
  
  for r := 1 to 3 do  
    begin  
      for c := 1 to 3 do  
        begin  
          write(grid[c][r]);  
        end;  
        writeln;  
      end;  
    end;  
  end.  
<< Write your answer here >>
```

5. What is the main difference between global memory and dynamic memory?

Multiple choice questions

1. Assuming that 'arr' is an array of real numbers what does the following procedure do?

```
procedure proc(var arr : RealArray;  
              i : integer;  
              j : integer);  
  
var  
  temp : real;  
begin  
  temp := arr[i];  
  arr[i] := arr[j];  
  arr[j] := temp;  
end;
```

- a) Accept three arguments as input
- b) Swaps two integers
- c) Swaps two array elements
- d) a & b
- e) a & c

2. Please refer to the program below in order to determine which of the following statements are true.

```
program mc2;  
var  
  num : integer;  
begin  
  var num: integer;  
end.
```

- a) Variable “num” is a global variable.
- b) Variable “num” is local to the main procedure.
- c) There are two variables called “num”, one is global and the other is local.
- d) There is an error in the declaration of variable “num”.
- e) None of the above

3. For this question please refer to the program shown below.

```
program pointer (output);  
begin  
  var intPtr : ^integer;  
  new(intPtr);  
  intPtr^ := 10;  
  writeln(intPtr^);  
end.
```

Which of the following are true of the assignment statement “intPtr^ := 10;”?

- a) It puts the value 10 in an integer variable called ‘intPtr’.
- b) It makes the pointer point to memory address ten.
- c) It dereferences a pointer and stores in the dynamically allocated memory the integer ten.
- d) (a) & (b)
- e) None of the above.