Vavuniya Campus of the University of Jaffna

First Examination in Information and Communication Technology - 2017

Second Semester - March/April 2019

ICT1262 Practical for Operating System

Answer All Questions

Time Allowed : Three hours

Instructions: Save all of your files and an output print screen image into a folder named with your Index No (e.g. IT12005).

1. A permutation is an arrangement of all or part of a set of objects, with regard to the order of the arrangement. For example, suppose we have a set of three alphabets A, B, and C. We might ask how many ways we can arrange 2 letters from that set. Each possible arrangement would be an example of a permutation. The complete list of possible permutations would be: AB, AC, BA, BC, CA, and CB.
   Write a shell script to perform the tasks given below.

   (a) Read a 4-digit number(No identical digits).

   (b) Extract each digit into an array.

   (c) Find all the possible permutations by arranging 2 digits from the digits set.

   Sample expected output

   ```
   Enter the Number:  4567
   The Permutations list is :  45,46,47,54,56,57,64,65,67,74,75,76.
   ```

   [35%]

[To be continued...]

2. Write a C program to perform each of the following tasks sequentially .

(a) Create a *parent* process with two child processes , *Child1* and *Child2*.

(b) The *parent* process reads the value Number of Pages (NP) and pass it to the *Child1* process.

(c) Parent process reads the Size of a Page (SP), Size of the Memory (SM) from the user and pass it to the *Child2*.

(d) The *Parent* process computes Displacement Number (DN).

(e) The *Child1* process computes Page Number (PN) and sends it to *Parent* process.

(f) The *Child2* process computes Page Frame Number (FN) and sends it to *Parent* process.

(g) The *Parent* process prints the Virtual Address Size (VAS) and Physical Address Size (PAS). [65%]

Hint : You may use the pipe structure for inter process communication and consider the parent-child communications as depicted in Figure 1 below:

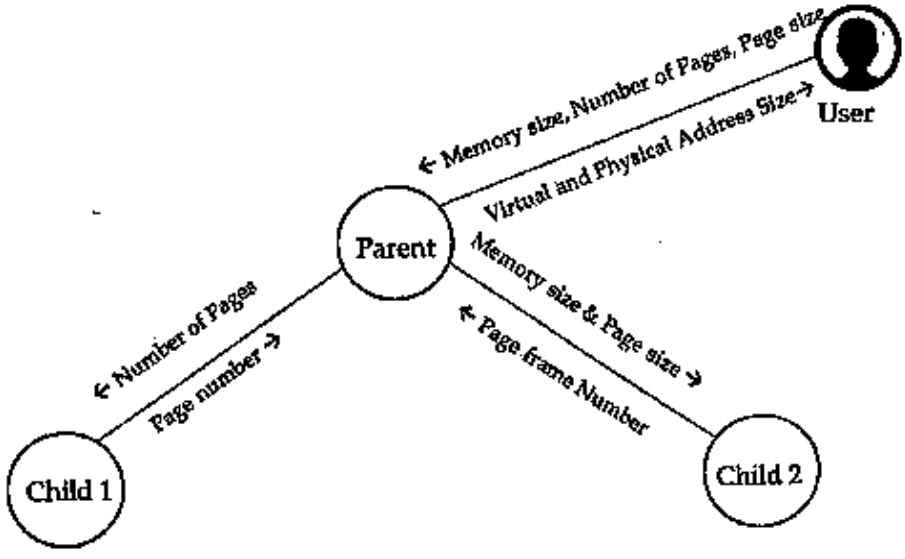

Figure 1: *Parent-Child* Communications

[To be continued...]

Sample expected output:

```
I am parent
Enter Number of Pagés of the the process (NP): 1024
Enter your Size of Memory in MB (SM): 8
Enter your Size of Page in Bytes (SP): 64
I am Child1 received Number of Pages (NP)1024 from Parent.
I am Child2 received The Size of a Page (SP)64 Bytes, Size of the Memory
(SM)8 MB from the Parent.
I am Parent received Page Number(PN) 10 from Child1.
I am Parent received Page Frame Number(FN) 17 from Child2.
I am Parent The Displacement Number(DN)is 6.
I am Parent The Virtual Address Size(VAS) 16 and the Physical Address
Size (PAS)23.
```

Note: Use the equations given below to compute the PN,FN,DN,VAS and PAS.

$$PN=\log_2(NP)$$

$$FN=\log_2(\frac{SM}{SP})$$

$$DN=\log_2(SP)$$

$$VAS=PN + DN$$

$$PAS=FN + DN$$