



Vavuniya Campus of the University of Jaffna

First Examination in Information and Communication Technology - 2016

Second Semester - November/December 2017

ICT1262 Practical for Operating System

Answer All Questions

Time Allowed : Three hours

Instructions

Note: Save all of your files and an output print screen image into a folder named with your Index No(e.g. IT11005).

1. Write a shell script to print the pattern as shown in Figure 1.

```
      *  
    * * *  
  * * * * *  
* * * * * *
```

Figure 1: Pattern

[35%]

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

- (a) To create a *parent* process with three child processes such as *Child1*, *Child2* and *Child3*. The *parent* process reads the mark for five course units from the user and pass it to the *Child1* process using pipe.

[To be continued...]

- (b) To find the Grade for the received marks by the *Child1* process and send it to *Child2* process via pipe.

Note: Use pointer which can be used as arrays to store the grades.

e.g. `char *grade[5] = "A+", "A", "A-", "B+", "B";`

- (c) To find the Grade Point Average (GPA) by *Child2* process for the received grades and send it to *Child3* process via pipe. Assume that each of the five course units has two credits.
- (d) To find the rank by *Child3* process for the received GPA and send it to the parent process via pipe.
- (e) Finally, to print the rank for the semester by the parent process. [65%]

Hint: You may consider the parent-child communications as depicted in Figure 2 below:

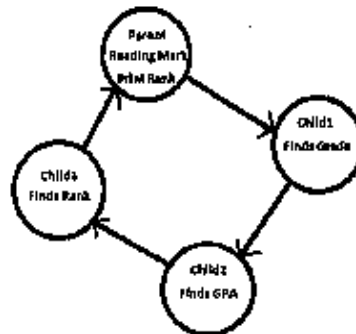


Figure 2: Parent-Child Communications

Sample expected output:

I am parent

Enter mark 1: 76

Enter mark 2: 68

Enter mark 3: 52

Enter mark 4: 61

Enter mark 5: 72

I am Child1 received mark 76,68,52,61,72 from Parent.

I am Child2 received grades A,B+,C+,B,A- from Child1.

I am Child3 received GPA 3.26 from Child2.

I am Parent You have achieved "Third" Rank.

[To be continued...]

Note: Use Table 1 and Table 2 given below to calculate the grades, GPA and Rank.

$$GPA = \frac{\text{Sum of (Credits Grade Point)}}{\text{Total Credits}} = \frac{\sum c_i g_i}{\sum c_i}$$

where c_i is the number of credits for the i th course and g_i is the grade point value for the i th course unit.

Table 1: Grades and Mark and GPV

Mark Range	Grade	Grade Point Value
80 - 100	A+	4.0
75 - 79	A	4.0
70 - 74	A-	3.7
65 - 69	B+	3.3
60 - 64	B	3.0
55 - 59	B-	2.7
50 - 54	C+	2.3
45 - 49	C	2.0
40 - 44	C-	1.7
35 - 39	D+	1.3
30 - 34	D	1.0
00 - 29	E	0.0

Table 2: Rank/Pass Table

GPA	Rank/Pass
≥ 3.7	First Rank
3.30-3.69	Second Rank
3.0-3.29	Third Rank
2.00-2.99	Pass