

**NATIONAL UNIVERSITY OF COMPUTER AND EMERGING
SCIENCES ISLAMABAD****OPERATING SYSTEMS**

ASSIGNMENT 03

Due Date: 08:00 AM 5th, May 2021.

Instructions

- Zero marks will be awarded to the students involved in plagiarism.
 - All the submissions will be done on google classroom.
 - You have to submit .c/.cpp files. Naming convention has to be followed strictly. Each question will be named as q1.cpp/q1.c. You have to submit 1 zipped file having the questions.
 - Be prepared for viva or anything else after the submission of assignment for two weeks.
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QUESTION NO. 01: [Marks | 20]

Write a program that find frequent item-set of grocery store data. Your program will take data file as command line argument.

Format and Sample of Data File:

0.5

6

Paratha, Makhan, Anda, Sharbat

Paratha, Makhan, Sharbat

Paratha, Doodh, Dahi

Paratha, Sharbat, Doodh

Makhan, Sharbat, Doodh

Paratha, Anda, Makhan, Sharbat

In this sample data file 0.5 is support threshold, 6 is no of transactions and the remaining are transactions.

Step 1: [5 marks]

Create child1 using fork in parent

After fork **Parent** process read the file and store the data. Evaluate the value of **threshold** = support threshold x no of transactions.

For given example threshold = $0.5 \times 6 = > 3$

Now parent process send value of threshold and all the transactions to the child1 using **unnamed pipe**.

Step 2: [5 marks]

Child1 have to find the frequency of all the items as shown in below table and print it on terminal.

Items	Frequency
Paratha	5
Makhan	4
Anda	2
Sharbat	5
Doodh	3
Dahi	1

After that remove the items that have frequency less than **threshold** value and print it on terminal.

Items	Frequency
Paratha	5
Sharbat	5
Makhan	4
Doodh	3

Now **Child1** creates **Child2** and send the above items and their frequencies, and transactions to **Child2** using **unnamed pipe**.

Step 3: [5 marks]

Child2 find 2-item pair frequencies and print it on terminal as shown below.

Items	Frequency
Paratha, Makhan	3
Paratha, Sharbat	4
Paratha, Doodh	2
Makhan, Sharbat	4
Makhan, Doodh	1
Sharbat, Doodh	2

After that remove the items that have frequency less than **threshold** value and print it on terminal.

Item	Frequency
Paratha, Sharbat	4
Paratha, Makhan	3
Makhan, Sharbat	3

Now **Child2** creates **Child3** and send the above items and their frequencies, and transactions to **Child3** using **unnamed pipe**

Step4: [5 marks]

Child3 find 3-item pair frequencies and print it on terminal as shown below.

Item	Frequency
Paratha, Makhan, Sharbat	3

After that remove the items that have frequency less than **threshold** value if any and print it on terminal.

And also cout/printf the final result in output.txt using **dup system calls**.

Important Note: You can take finding frequencies code from anywhere with reference. But OS related code should not be taken from anywhere.

QUESTION NO. 02: [Marks | 10]

Write two different programs P1 and P2 that will connect through a pipe and chat with one another. P1 process will take the total and obtained marks of all the assessments of OS Lab shown from user and send this data to P2. P2 process will calculate the absolute marks of each assessment, calculate total absolute and calculate the grade using absolute grading policy of Fast. Also print these on terminal.

Use below table as reference for the no assessments and also for calculating absolute marks.

Sr#	Evaluation Name	Weightage
1	Assignment	15
2	Final Exam	40
3	Lab Work	30
4	Project	15

QUESTION NO. 03: [Marks | 20 (5+5+5+5)]**grep a *.* | sort | sum | wc**

Write a code for the above commands using unnamed pipe and dup.