

SRE ASSIGNMENT

Task 1: Write a simple program in your preferred language to demonstrate memory leak and fix it

Solution:

Language: C

Definition: Memory leak occurs when programmers create a memory in heap and forget to delete it.

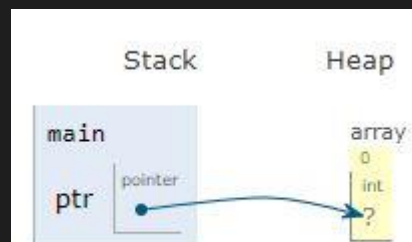
Example:

```
#include<stdlib.h>

int main()
{
    int* ptr = (int *) malloc(sizeof(int));

    /* Do some work */

    return 0;
}
```



Explanation: In the above code even the control reaches the end of the block the Heap memory still allocated and not destroyed which leads to memory wastage or memory leak

Fix:

```
#include<stdlib.h>

int main()
{
    int* ptr = (int *) malloc(sizeof(int));

    /* Do some work */

    free(ptr);

    return 0;
}
```



Explanation: In the above code we fixed the memory leak by deallocating the memory of the ptr variable with the help of in-built function called free().



Task 2: You are given the sample file where each row contains state name and city name separated by comma. You need to write a program in your preferred language to fold different cities of same state in single row separated by semicolon.

#Input file

Tamil Nadu,Chennai

Kerala,Palakkad

Karnataka,Bangalore

Kerala,Kochi

Tamil Nadu,Trichy

#Output

Tamil Nadu,Chennai;Trichy

Kerala,Palakkad;Kochi

Karnataka;Bangalore

Solution

Language: Python

```
file1 = open("input file.csv","r")
d = dict()
a=file1.readlines()
for i in a:
    temp=i.split(',')
    d[temp[0]]=[]
for i in a:
    temp=i.split(',')
    d[temp[0]].append(temp[1].strip())
for i,j in d.items():
    j = list(set(j))
    if(len(j) == 1):
        print(i,end=';')
    else:
        print(i,end=',')
res = ""
while(len(j)):
    res+=(j.pop(0)+";")
print(res[:-1])
```

Output:

Tamil Nadu,Chennai;Trichy

Kerala,Kochi;Palakkad

Karnataka;Bangalore



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Task 3: Create a shell script to print all words on lines of a file in reverse order

#Input file

Hello World

First in First out

#Output

World Hello

out First in First

Solution:

```
#Reverse Words in a file

while IFS= read -r line;
do
    var=$(tac -s ' ' <<< "$line");
    echo $var;
done < input.txt
```

Task 4: You will be provided with a block of text, You need to write a program to find the unique e-mail addresses present in the text.

Note: "@" sign can be used for a variety of purposes.

#Input File

Aqfer offers the next generation enterprise data platform solution that enables companies to get to the truth about their customers and their data.

Available positions:

Product Developer - product@aqfer.com

Mail us to info@aqfer.com to know more.

Contact us at info@aqfer.com

Visit us @ www.aqfer.com

Solution:

Language: python

```
import re
inputfile = open("input.txt","r")
allText = inputfile.readlines()
def listToString(a):
    allWords = ""
    for text in a:
        allWords += text
    return allWords
wholeText = listToString(allText)
emailsList = re.findall(r"[a-z0-9\.\-+_]+@[a-z0-9\.\-+_]+\.[a-z]+", wholeText)
def mailsToString(a):
    allMails = ""
    for mails in a:
        allMails += mails+"\n"
    return allMails
print(mailsToString(emailsList))
```

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Task 5: Find all the parent processes of the applications running in a linux environment and group it based on the application. Monitor the collective memory utilization of a process(parent+child) over every minute for 5minutes and if it is consistently higher than 90%, restart/kill the process and note the time it is restarted and id of the process.

Write a shell script to achieve the above scenario

sample:

\$: ps -ef

8000 1 command1 -- parent pid of the app1

8002 8000 --- child process of app1

8003 8000 --- child process of app2

7000 1 command2. -- parent pid of app2

7001 7000. -- child process of app2

Output: App1: 8000: 8002,8003

App2: 7000: 7001

collect the memory utilization each minute for 5minutes and based on threshold(90%) restart/kill the process and note the time and pid

Solution:

Language: shell script

```
#!/bin/bash

collect_pid=$(ps -o pid,%mem | awk '{print $1 ":" $2 ":"}' | tail -n +2)

app=0
restart_process () {
    kill -19 $1
    child_Process=$(ps -f --ppid $1 | awk '{print $2}' | tail -n +2)
    app=$((app+1))
    printf "\`echo "App ${app}: ${1}:"\` \`echo $child_Process`\n"
}

MAX_THRESHOLD=90.0
for i in $collect_pid
do
```

```
PID=$(echo $i | cut -d: -f1)
Mem=$(echo $i | cut -d: -f2)

if [ 1 -eq `echo "${Mem} < ${MAX_THRESHOLD}" | bc` ]
then
    restart_process $PID
fi
done
```

To achieve collect the memory utilization each minute for 5minutes the file path command has to be added in **CRON** file

Example:

```
*/5 * * * * command
```

Task 5: Draw a network diagram of the outgoing request to `www.aqfer.com` which has been hit in a terminal using curl. Include all the OSI layers in the diagram and mention the place/file to be modified if that request to be redirected to one of the servers present in the same environment.

Sample: I have a group of servers with a CIDR range of 10.0.0.0/24. A request has been made to `www.aqfer.com` from server1 with ip 10.0.0.5 and that request should end up at the server 10.0.0.1. Mention which layer/place has to be modified to achieve the given scenario in the network diagram

Solution:

