https://lh4.googleusercontent.com/kmm_fFfBsspMaKI41YTY6JE_Od9JYFRdlEhWaavsEtct1g_9uzp2Z1NsguKFit-Oj2syR0-ZwQjWea9rQJorXjzyFmHCJQBgNNt-_DqjJdm6jP2AImiiQ6Song6nbmsSGf-X_8Kc**SRE ASSIGNMENT**

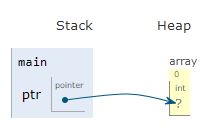
**Task 1:** **Write a simple program in your preferred language to demonstrate memory leak and fix it**

**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 \*/

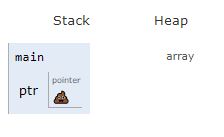
    return 0;

}

**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().

https://lh4.googleusercontent.com/kmm_fFfBsspMaKI41YTY6JE_Od9JYFRdlEhWaavsEtct1g_9uzp2Z1NsguKFit-Oj2syR0-ZwQjWea9rQJorXjzyFmHCJQBgNNt-_DqjJdm6jP2AImiiQ6Song6nbmsSGf-X_8Kc**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

Colab Link for instant Run the code: [Click Here](https://colab.research.google.com/drive/1MMYQkz3PbTlhwYZXVYi7tA7CPq8EysNT?usp=sharing)

https://lh4.googleusercontent.com/kmm_fFfBsspMaKI41YTY6JE_Od9JYFRdlEhWaavsEtct1g_9uzp2Z1NsguKFit-Oj2syR0-ZwQjWea9rQJorXjzyFmHCJQBgNNt-_DqjJdm6jP2AImiiQ6Song6nbmsSGf-X_8Kc**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

https://lh4.googleusercontent.com/kmm_fFfBsspMaKI41YTY6JE_Od9JYFRdlEhWaavsEtct1g_9uzp2Z1NsguKFit-Oj2syR0-ZwQjWea9rQJorXjzyFmHCJQBgNNt-_DqjJdm6jP2AImiiQ6Song6nbmsSGf-X_8Kc**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](http://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))

Colab Link for instant Run the code: [Click Here](https://colab.research.google.com/drive/1d9CQS1c4PsYPoIS-BxgCjQzxyugLKlMf?usp=sharing)

https://lh4.googleusercontent.com/kmm_fFfBsspMaKI41YTY6JE_Od9JYFRdlEhWaavsEtct1g_9uzp2Z1NsguKFit-Oj2syR0-ZwQjWea9rQJorXjzyFmHCJQBgNNt-_DqjJdm6jP2AImiiQ6Song6nbmsSGf-X_8Kc**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

https://lh4.googleusercontent.com/kmm_fFfBsspMaKI41YTY6JE_Od9JYFRdlEhWaavsEtct1g_9uzp2Z1NsguKFit-Oj2syR0-ZwQjWea9rQJorXjzyFmHCJQBgNNt-_DqjJdm6jP2AImiiQ6Song6nbmsSGf-X_8Kc    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 achive collect the memory utilization each minute for 5minutes the file path command has to be added in **CRON** file

Example:

\*/5  \* \* \* \* command

https://lh4.googleusercontent.com/kmm_fFfBsspMaKI41YTY6JE_Od9JYFRdlEhWaavsEtct1g_9uzp2Z1NsguKFit-Oj2syR0-ZwQjWea9rQJorXjzyFmHCJQBgNNt-_DqjJdm6jP2AImiiQ6Song6nbmsSGf-X_8Kc**Task 5**: Draw a network diagram of the outgoing request to `www.aqfer.com` which ha 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.

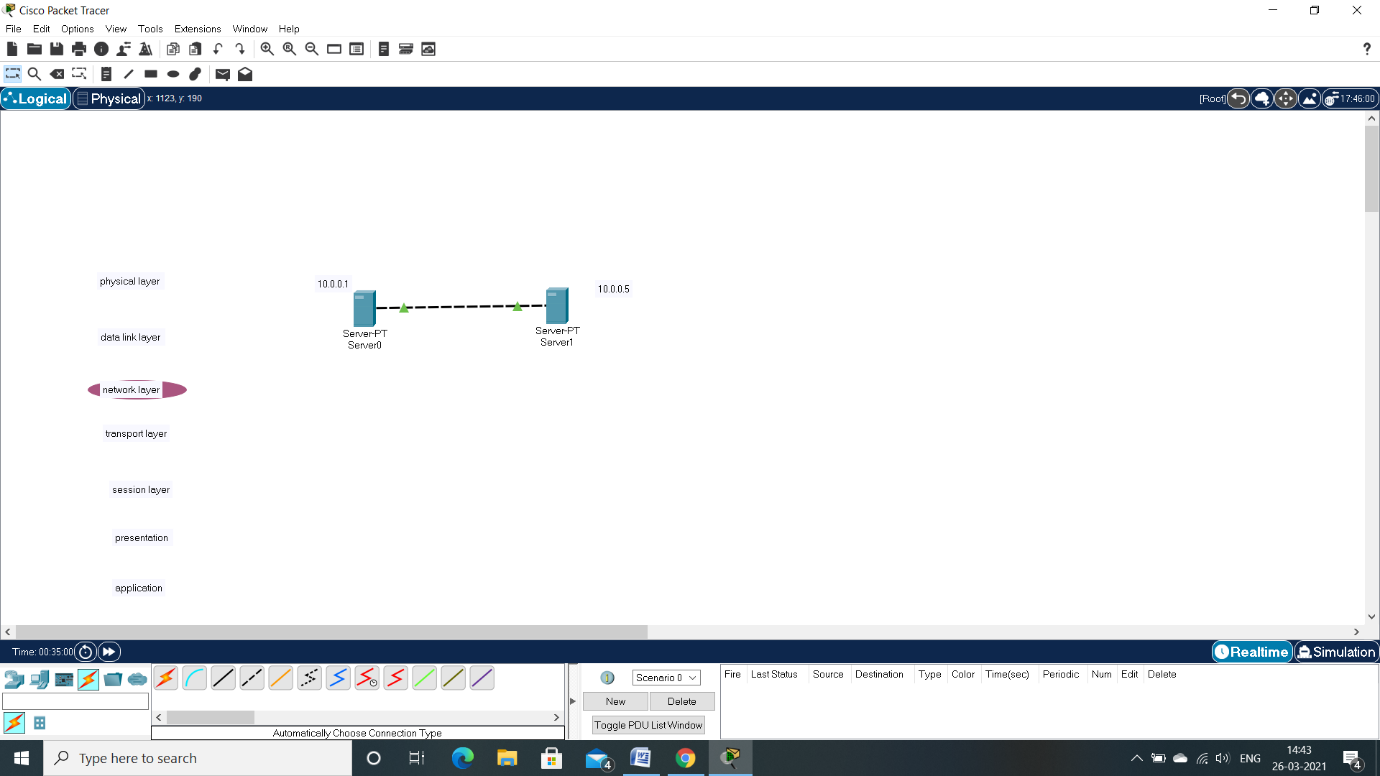
Sample: I have a group of servers with a CIDR range of 10.0.0.0/24. A request has been

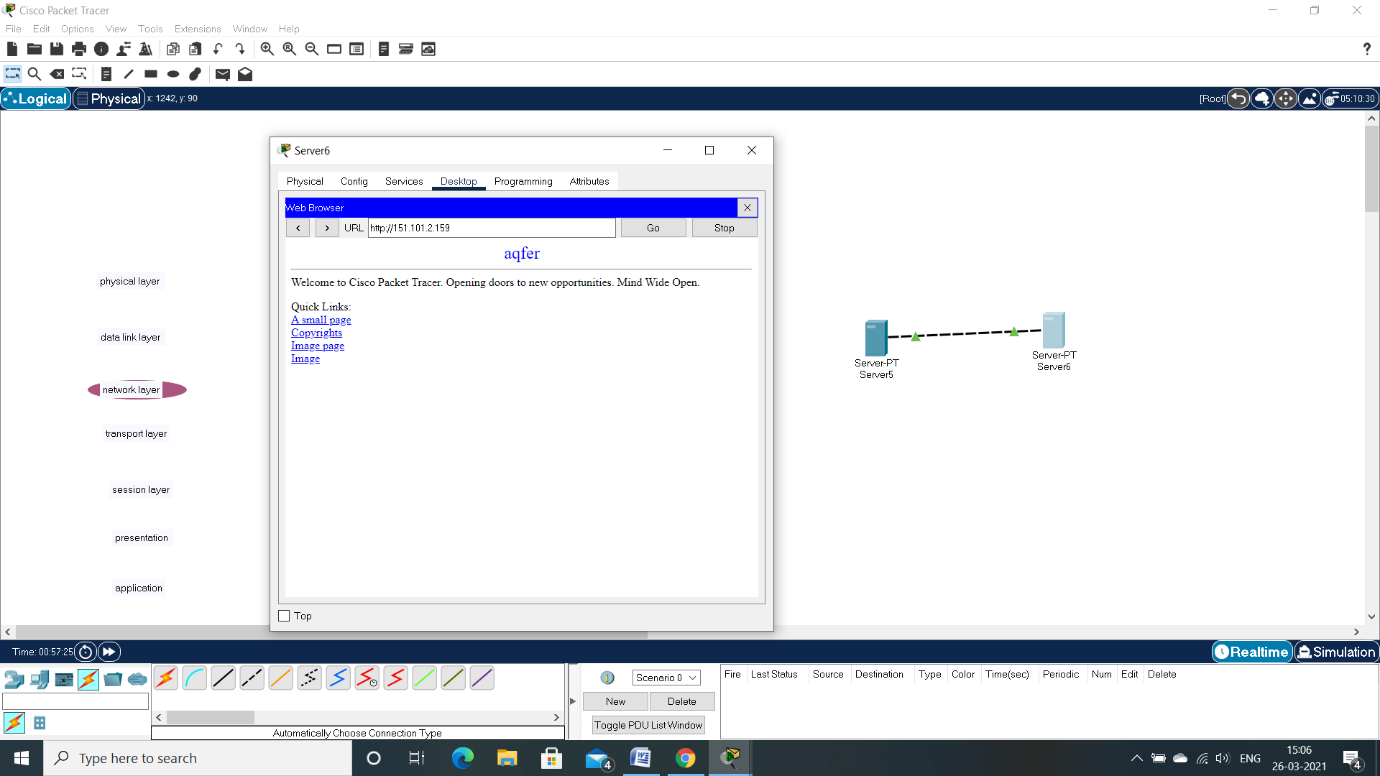
made to `www.aqfer.com` from server1 with ip 10.0.0.5 and that request should end up

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:**

****

****