

## ICS 432 - 01 – Distributed and Cloud Computing Fall 2021

**Assignment #1 : Working with Cloud Virtual Machines**

Exercise 1: Hosting a web site on an AWS EC2 instance.

**Homework report screen-shot #1:**

The screenshot shows the AWS EC2 Management Console interface. On the left, there's a sidebar with various services like EC2 Dashboard, Events, Tags, and Instances. Under Instances, it shows 'Instances (1/1)'. The main area displays a table with one row for an instance named 'Danddank ...'. The instance details are as follows:

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IPv4 DNS	Public IPv4 ...
Danddank ...	i-05a38511178bf90a0	Running	t2.micro	-	No alarms	us-east-1a	ec2-18-212-243-94.co...	18.212.243.94

Below the table, there's a detailed view for the selected instance (i-05a38511178bf90a0). It shows the following details:

- Details:** Instance ID: i-05a38511178bf90a0; Public IPv4 address: 18.212.243.94 (open address); Private IPv4 addresses: 172.31.16.117.
- Security:** Instance state: Running; Instance type: t2.micro.
- Networking:** Private IPv4 DNS: ip-172-31-16-117.ec2.internal; VPC ID: vpc-64fa8419.
- Storage:** AWS Compute Optimizer finding: User: arn:aws:sts::196580907486:assumed-role/vocstartor/user1564948+Nalongsone\_Danddank is not authorized to perform: compute-optimizer:GetEnrollmentStatus on resource: \* with an explicit deny.
- Monitoring:** No monitoring data shown.
- Tags:** No tags shown.

**Homework report screen-shot #2:**

```

ec2-user@ip-172-31-16-117:~$ Last login: Sat Sep 18 18:26:21 on ttys001
(base) ping58972@Nalongsone-MacBook-Air Assignment-01 % chmod 400 ics432homewor
k1keypair.pem
(base) ping58972@Nalongsone-MacBook-Air Assignment-01 % ssh -i "ics432homewor
k1keypair.pem" ec2-user@ec2-18-212-243-94.compute-1.amazonaws.com
The authenticity of host 'ec2-18-212-243-94.compute-1.amazonaws.com (18.212.243.
.94)' can't be established.
ECDSA key fingerprint is SHA256:EeRPzAW0v8+5XD4Ysgz9Yjqlid2qDExzAzGs9RCxiqA.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added 'ec2-18-212-243-94.compute-1.amazonaws.com,18.212.243
.94' (ECDSA) to the list of known hosts.

--| _ _|_
 _| ( / Amazon Linux 2 AMI
---| \___|___

https://aws.amazon.com/amazon-linux-2/
[ec2-user@ip-172-31-16-117 ~]$ 
```

**Homework report screen-shot #3:**

```
ec2-user@ip-172-31-16-117:~
```

Installing : gperftools-libs-2.6.1-1.amzn2.x86\_64 3/5  
Installing : 1:nginx-filesystem-1.20.0-2.amzn2.0.4.noarch 4/5  
Installing : 1:nginx-1.20.0-2.amzn2.0.4.x86\_64 5/5  
Verifying : openssl11-pkcs11-0.4.10-6.amzn2.0.1.x86\_64 1/5  
Verifying : 1:nginx-1.20.0-2.amzn2.0.4.x86\_64 2/5  
Verifying : 1:openssl11-libs-1.1.1g-12.amzn2.0.3.x86\_64 3/5  
Verifying : gperftools-libs-2.6.1-1.amzn2.x86\_64 4/5  
Verifying : gperftools-libs-2.6.1-1.amzn2.x86\_64 5/5

Installed:  
nginx.x86\_64 1:1.20.0-2.amzn2.0.4

Dependency Installed:  
gperftools-libs.x86\_64 0:2.6.1-1.amzn2 nginx-filesystem.noarch 1:1.20.0-2.amzn2.0.4  
openssl11-libs.x86\_64 1:1.1.1g-12.amzn2.0.3

Complete!

```
0 ansible          available  \
[ =2.4.2  =2.4.6  =2.8  =stable ]  
2 httpd_modules    available  \
[ =1.0  =stable ]  
3 memcached1.5    available  \
[ =1.5.1  =1.5.16  =1.5.17 ]  
5 postgresql9.6   available  \
[ =9.6.6  =9.6.8  =stable ]  
6 postgresql10     available  \
[ =10  =stable ]  
9 R3.4             available  \
[ =3.4.3  =stable ]  
10 rustl           available  \
[ =1.22.1  =1.26.0  =1.26.1  =1.27.2  =1.31.0  =1.38.0
 =stable ]  
11 vim              available  \
[ =8.0  =stable ]  
15 php7.2          available  \
[ =7.2.0  =7.2.4  =7.2.5  =7.2.8  =7.2.11  =7.2.13  =7.2.14
 =7.2.16  =7.2.17  =7.2.19  =7.2.21  =7.2.22  =7.2.23
 =7.2.24  =7.2.26  =stable ]  
17 lamp-mariadb10.2-php7.2 available  \
[ =10.2.10_7.2.0  =10.2.10_7.2.4  =10.2.10_7.2.5
 =10.2.10_7.2.8  =10.2.10_7.2.11  =10.2.10_7.2.13
 =10.2.10_7.2.14  =10.2.10_7.2.16  =10.2.10_7.2.17
 =10.2.10_7.2.19  =10.2.10_7.2.22  =10.2.10_7.2.23
 =10.2.10_7.2.24  =stable ]  
18 libreoffice      available  \
[ =5.0.6.2_15  =5.3.6.1  =stable ]  
19 gimp             available  \
[ =2.8.22 ]  
20 docker=latest    enabled  \
[ =17.12.1  =18.03.1  =18.06.1  =18.09.9  =stable ]  
21 mate-desktop1.x  available  \
[ =1.19.0  =1.20.0  =stable ]  
22 GraphicsMagick1.3 available  \
[ =1.3.29  =1.3.32  =1.3.34  =stable ]  
23 tomcat8.5        available  \
[ =8.5.31  =8.5.32  =8.5.38  =8.5.40  =8.5.42  =8.5.50
 =stable ]
```

## Homework report screen-shot #4:

```
ec2-user@ip-172-31-16-117:~/data/www/BallotOnline
```

```
[ec2-user@ip-172-31-16-117 www]$ cd BallotOnline
[ec2-user@ip-172-31-16-117 BallotOnline]$ ls
about-us.html assets contact-us.html index.html nginx.conf services.html
[ec2-user@ip-172-31-16-117 BallotOnline]$
```

## Homework report screen-shot #5:

```
ec2-user@ip-172-31-16-117:/data/www/BallotOnline
about-us.html assets contact-us.html index.html nginx.conf services.html
[ec2-user@ip-172-31-16-117 BallotOnline]$ cat index.html
<!DOCTYPE html>

<html>
  <head>
    <meta charset="utf-8" />
    <title>Home - BallotOnline</title>
  </head>
  <body>
    <div style="text-align: left; text-indent: 0px; padding: 0px 0px 0px; margin: 0px 0px 0px;"><table width="100%" border="0" cellpadding="0" cellspacing="2" style="border-width: 0px; background-color: #ffffff;">
      <tr valign="top">
        <td colspan="2" width="523">
          <center>
            <a href="index.html">
              
            </a><br />
          </center>
        </td>
      </tr>
      <tr valign="top">
        <td width="164">
          <ul>
            <li>
              <a href="index.html">Home</a>
            </li>
            <li>
              <a href="about-us.html">About Us</a>
            </li>
            <li>
              <a href="services.html">Services</a>
            </li>
            <li>
              <a href="contact-us.html">Contact Us</a>
            </li>
          </ul><br />
        </td>
        <td width="359">
          <p>BallotOnline, a growing company providing online voting solutions to a global client base in North America, Europe, and Asia.</p>
          <br />
        </td>
      </tr>
    </table>
  </body>

```

## Homework report screen-shot #6:

```
ec2-user@ip-172-31-16-117:/data/www/BallotOnline
<li>
  <a href="contact-us.html">Contact Us</a>
</li>
</ul><br />
</td>
<td width="359">
  <p>BallotOnline, a growing company providing online voting solutions to a global client base in North America, Europe, and Asia.</p>
  <br />
</td>
</tr>
<tr valign="top">
  <td colspan="2" width="523">
    <p>UMUC Cloud Computing Architecture Master's Degree program</p>
    
    <p>For educational purposes only. © Learning Design & Solutions, UMUC. All Rights Reserved. No part of this work may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording, or by any information storage and retrieval system, without written permission from UMUC.</p>
  <br />
  </td>
</tr>
</table>
</div>
</body> <!-- /body -->
[ec2-user@ip-172-31-16-117 BallotOnline]$ sudo chmod 755 index.html
[ec2-user@ip-172-31-16-117 BallotOnline]$ sudo mv /etc/nginx/nginx.conf /etc/nginx.conf.old
[ec2-user@ip-172-31-16-117 BallotOnline]$ cat /ect/nginx/nginx.conf
cat: /ect/nginx/nginx.conf: No such file or directory
[ec2-user@ip-172-31-16-117 BallotOnline]$
```

## Homework report screen-shot #7:

```
ec2-user@ip-172-31-16-117:/data/www/BallotOnline
```

```
#  
# server {  
#     listen      443 ssl http2 default_server;  
#     listen      [::]:443 ssl http2 default_server;  
#     server_name _;  
#     root        /usr/share/nginx/html;  
#  
#     ssl_certificate "/etc/pki/nginx/server.crt";  
#     ssl_certificate_key "/etc/pki/nginx/private/server.key";  
#     # It is *strongly* recommended to generate unique DH parameters  
#     # Generate them with: openssl dhparam -out /etc/pki/nginx/dhparams.pem 2048  
#     #ssl_dhparam "/etc/pki/nginx/dhparams.pem";  
#     ssl_session_cache shared:SSL:1m;  
#     ssl_session_timeout 10m;  
#     ssl_protocols TLSv1 TLSv1.2;  
#     ssl_ciphers HIGH:SEED:!aNULL:!eNULL:!EXPORT:!DES:!MD5:!PSK:!aDH:!aECDH:!EDH-DSS-DES-CBC3-S  
HA:!KRB5-DES-CBC3-SHA:!SRP;  
#     ssl_prefer_server_ciphers on;  
#  
#     # Load configuration files for the default server block.  
#     include /etc/nginx/default.d/*.conf;  
#  
#     location / {  
#  
#         error_page 404 /404.html;  
#         location = /40x.html {  
#             }  
#  
#         error_page 500 502 503 504 /50x.html;  
#         location = /50x.html {  
#             }  
#     }  
# }
```

[ec2-user@ip-172-31-16-117 BallotOnline]\$ █

## Homework report screen-shot #8:

```
ec2-user@ip-172-31-16-117:/data/www/BallotOnline
```

```
[ec2-user@ip-172-31-16-117 BallotOnline]$ sudo nginx  
[ec2-user@ip-172-31-16-117 BallotOnline]$ curl http://localhost  
<!DOCTYPE html>  
  
<html>  
  <head>  
    <meta charset="utf-8" />  
    <title>Home - BallotOnline</title>  
  </head>  
  
  <body>  
    <div style="text-align: left; text-indent: 0px; padding: 0px 0px 0px 0px; margin: 0px 0px 0px 0px;"><table width="100%" border="0" cellpadding="2" cellspacing="2" style="border-width: 0px; background-color: #ffffff;">  
      <tr valign="top">  
        <td colspan=2 width="523">  
          <center>  
            <a href="index.html">  
                
            </a><br />  
          </center>  
        </td>  
      </tr>  
      <tr valign="top">  
        <td width="164">  
          <ul>  
            <li>  
              <a href="index.html">Home</a>  
            </li>  
            <li>  
              <a href="about-us.html">About Us</a>  
            </li>  
            <li>  
              <a href="services.html">Services</a>  
            </li>
```

## Homework report screen-shot #9:

The screenshot shows the AWS EC2 Management Console with the URL <https://console.aws.amazon.com/ec2/>. The page is titled "Edit inbound rules" for security group "sg-0944d36063035dc5 - launch-wizard-1". It displays two inbound rules:

Inbound rules	Type	Protocol	Port range	Source	Description - optional
sgr-0cc0730b99c66f6bd	HTTP	TCP	80	Custom	0.0.0.0/0
sgr-0dd2ae3026cf9f79b	SSH	TCP	22	Custom	0.0.0.0/0

Buttons at the bottom include "Add rule", "Cancel", "Preview changes", and "Save rules".

## Homework report screen-shot #10: <http://18.212.243.94/index.html>

The screenshot shows a web browser window with the URL <http://18.212.243.94>. The page title is "Home - BallotOnline". The header features a logo of a ballot box and the text "BallotOnline". Below the header is a world map graphic. The main content area includes a navigation menu with links to Home, About Us, Services, and Contact Us. A copyright notice at the bottom states: "UMUC Cloud Computing Architecture Master's Degree program © Learning Design & Solutions, UMUC. All Rights Reserved. No part of this work may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording, or by any information storage and retrieval system, without written permission from UMUC.".

## Homework report screen-shot #11:

The screenshot shows an SSH terminal window titled "ec2-user@ip-172-31-16-117:~". It displays the source code of a web page and a file listing. The source code includes HTML, CSS, and JavaScript files. The file listing shows various system directories like /bin, /etc, /lib, etc.

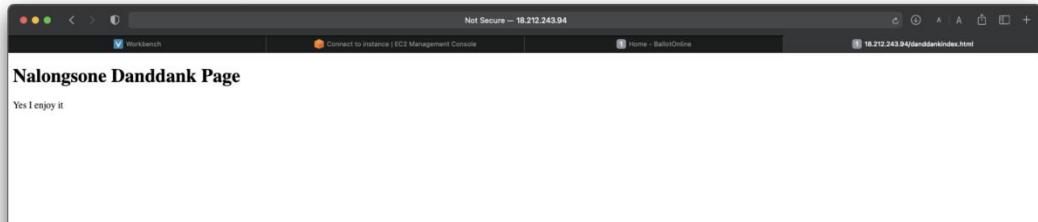
```
eca, Europe, and Asia.</p>
</td>
</tr>
<tr valign="top">
<td colspan=2 width="523"> <p>UMUC Cloud Computing Architecture Master's Degree program</p>

<p>For educational purposes only. © Learning Design & Solutions, UMUC. All Rights Reserved. No part o
f this work may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocop
ying, recording, or by any information storage and retrieval system, without written permission from UMUC.</p>
<br />
</td>
</tr>
</table>
</div>

</body> <!-- /body -->

</html>[ec2-user@ip-172-31-16-117 BallotOnline]$ cd ../
[ec2-user@ip-172-31-16-117 www]$ cd ../
[ec2-user@ip-172-31-16-117 data]$ ls
www
[ec2-user@ip-172-31-16-117 data]$ cd ../
[ec2-user@ip-172-31-16-117 /]$ ls
bin  data  etc  lib  local  mnt  proc  run  srv  tmp  var
boot  dev  home  lib64  media  opt  root  sbin  sys  usr
[ec2-user@ip-172-31-16-117 /]$ cd data
[ec2-user@ip-172-31-16-117 data]$ ls
www
[ec2-user@ip-172-31-16-117 data]$ cd ~/
[ec2-user@ip-172-31-16-117 ~]$ ls
[ec2-user@ip-172-31-16-117 ~]$ ls
[ec2-user@ip-172-31-16-117 ~]$ ls
danddankindex.html
[ec2-user@ip-172-31-16-117 ~]$
```

## Homework report screen-shot #12: <http://18.212.243.94/danddankindex.html>



### Summarize your learning:

I have learned to create and launch a EC2 instance of virtual machine in AWS by web page and terminal command line SSH, and learned how to deploy a web server to run in AWS in the Linux which I have created, then install a nginx web server software on the EC2 instance. Then, modified the security setting of the instance to allow public access for other people can access the website that I created. Finally, I have to stop the EC2 instance to terminate the cost for my account bill.

The most important thing is I have familiar with AWS EC2 instance virtual machine that is every significant concept of current technology and most popular use to deploy our modern website and other applications these day.

I think the most challenge me about working with AWS EC2 instance is working on the stable connection of internet to keep connect from my computer to a remote machine, AWS. And I have to familiar with the environment system, Linux, command line and system file of Linux, that is every challenge for me in the beginning.

## Exercise 2: Data Analysis using SQL on a GCP Virtual Machine. Homework report screen-shot #13:

This screenshot shows the Google Cloud Platform (GCP) dashboard. The left sidebar includes links for Home, Recent, Marketplace, Billing, APIs & Services, Support, IAM & Admin, Getting started, Compliance, Security, Anthos, Compute Engine, Kubernetes Engine, VMware Engine, Serverless, Cloud Run, Cloud Functions, App Engine, and Release Notes. The main content area has several sections: Project info (Project name: dandankics432homework1, Project ID: dandankics432homework1, Project number: 354416418761), APIs (No data available for the selected time frame), Google Cloud Platform status (All services normal), Monitoring (Create my dashboard, Set up alerting policies, Create uptime checks, View all dashboards, Go to Monitoring), and RPI Error Reporting (No sign of any errors). A top banner invites users to join Google Cloud Next on October 12-14.

## Homework report screen-shot #14:

This screenshot shows the Google Cloud Platform Overview - Billing page. The left sidebar has a single item: Billing account (Billing Account for Education). The main content area displays the Current month (September 1 – 19, 2021) with a Month-to-date total cost of \$0.00 and an End-of-month total cost (forecasted) of \$0.00 (Not enough historical data to project cost). It also shows a Cost trend from September 1, 2020 – September 30, 2021, with an Average monthly total cost of \$0.00. On the right, there are sections for Billing account (Manage, Billing Account for Education, 010100-2A5BC3-BE6EE1), Organization (No organization), Billing health checks, and Credits (\$50.00, Remaining credits: Distributed and Cloud Computing \$50.00 pt2). A note at the top states: "The search bar now supports searching for specific billing pages. For example, type "invoices" into the search bar to bring up the "Documents" page option."

## Homework report screen-shot #15:

The screenshot shows the Google Cloud Platform VM Instances page. On the left, there's a sidebar with sections like Compute Engine, Storage, Instance groups, and VM Manager. The main area displays a table of VM instances. One instance, 'danddarkhomework1mysql', is listed with the following details:

Status	Name	Zone	Recommendations	In use by	Internal IP	External IP	Connect
up	danddarkhomework1mysql	us-central-1a			10.128.0.2	34.133.21.116 (nicD)	SSH

Below the table, there are related actions: View billing report, Monitor VMs, Explore VM logs, Set up firewall rules, and Patch management.

A modal window titled 'Select an instance' is open on the right, displaying the message 'Please select at least one resource.'

## Homework report screen-shot #16:

The screenshot shows an SSH session connected to a Google Cloud VM instance. The terminal window displays the MySQL prompt:

```
root@dalongzone_danddark:~# mysql>
```

## Homework report screen-shot #17:

## **Homework report screen-shot #18:**

```
● Qiklabs - Hands-On Cloud Training                               ssh.cloud.google.com
● VM instances - Compute Engine - dandankhomework... - Google Cloud Platform
● nalongzone_dandankhomework@mysql:~$ /tmp

nalongzone_dandankhomework@mysql:~$ /tmp$ sudo systemctl status mysql
● mysql.service - MySQL Community Server
   Loaded: loaded (/lib/systemd/system/mysql.service; enabled; vendor preset: enabled)
     Active: active (running) since Sun 2021-09-19 08:17:44 UTC; 2hs ago
       Docs: man:mysqld(8)
     Main PID: 2978 (mysqld)
        Status: "Server is operational"
           CPU: 0.000 CPU(s) total (453)
          Memory: 360.9M
        CGroup: /system.slice/mysql.service
                 └─mysqld --basedir=/var/lib/mysql --log-error=/var/log/mysqld.log --socket=/var/run/mysqld/mysqld.sock

Sep 19 08:17:43 dandankhomework.mysql systemd[1]: Starting MySQL Community Server...
Sep 19 08:17:44 dandankhomework.mysql systemd[1]: Started MySQL Community Server.
nalongzone_dandankhomework@mysql:~$ /tmp$ mysqladmin -u root -p version
mysqladmin Ver 8.0.26 for Linux on x86_64 MySQL Community Server - GTG
Copyright (c) 2000, 2021, Oracle and/or its affiliates.

Oracle is a registered trademark of Oracle Corporation and/or its
affiliates. Other names may be trademarks of their respective
owners.

Protocol version         8
Server version          8.0.26
Protocol version        10
Connection               Localhost via UNIX socket
UNIX socket              /var/run/mysqld/mysqld.sock
Uptime:                  1 min 50 sec

Threads: 2 Questions: 2 Slow queries: 0 Opens: 117 Flush tables: 3 Open tables: 36 Queries per second avg: 0.018
nalongzone_dandankhomework@mysql:~$ /tmp$ mysql -u root -p
Welcome to the MySQL monitor. Commands end with ; or q.
Your MySQL connection id is 9
Server version: 8.0.26 MySQL Community Server - GPL

Copyright (c) 2000, 2021, Oracle and/or its affiliates.

Oracle is a registered trademark of Oracle Corporation and/or its
affiliates. Other names may be trademarks of their respective
owners.

Type 'help;' or 'h' for help. Type 'c' to clear the current input statement.
mysql> |
```

## **Homework report screen-shot #19:**

```
● Qiklabs - Hands-On Cloud Training
Status: "Passed" is operational*
State: 38 (INIT)
Memory: 360.9M
CGroup: /system.slice/mysql.service
└─:3306 /usr/sbin/mysqld

Sep 19 08:17:44 valongone_danddankdanddankhomeworkmysqlg systemd[1]: Starting MySQL Community Server...
Sep 19 08:17:44 valongone_danddankdanddankhomeworkmysqlg systemd[1]: Started MySQL Community Server.
valongone_danddankdanddankhomeworkmysqlg:/tmp$ mysql -u root -p version
mysqladmin Ver 8.0.26 for Linux on x86_64 (MySQL Community Server - GPL)
Copyright (c) 2000, 2021, Oracle and/or its affiliates.

Oracle is a registered trademark of Oracle Corporation and/or its
affiliates. Other names may be trademarks of their respective
owners.

server version      8.0.26
Protocol version   10
Connection          Localhost via UNIX socket
UNIX socket        /var/run/mysqld/mysqld.sock
Uptime              1 min 50 sec

Threads: 2 Questions: 0 Opens: 117 Flush tables: 3 Open tables: 36 Queries per second avg: 0.018

valongone_danddankdanddankhomeworkmysqlg:/tmp$ mysql -u root -p
Welcome to the MySQL monitor. Commands end with ; or \q.
Your MySQL connection id is 9
server version: 8.0.26 MySQL Community Server - GPL
Copyright (c) 2000, 2021, Oracle and/or its affiliates.

Oracle is a registered trademark of Oracle Corporation and/or its
affiliates. Other names may be trademarks of their respective
owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql> create database movie_ratings_database;
Query OK, 1 row affected (0.01 sec)

mysql> exit
Bye
valongone_danddankdanddankhomeworkmysqlg:/tmp$ cd ~/
valongone_danddankdanddankhomeworkmysqlg:~$ ls
item.csv  ratings.csv  users.csv
valongone_danddankdanddankhomeworkmysqlg:~$
```

**Homework report screen-shot #20: 943 rows in the users table**

```
OnMaster : HandsonCloudTraining
natingame_dandtark@handsoncloudtraining:~$ sudo apt update
Hit:1 http://security.debian.org/debian-security buster/updates InRelease
Hit:2 http://deb.debian.org/debian buster InRelease
Hit:3 http://deb.debian.org/debian buster-updates InRelease
Hit:4 http://deb.debian.org/debian buster-backports InRelease
Get:5 https://packages.cloud.google.com/apt google-cloud-packages-archive-keyring-buster InRelease [9553 B]
Hit:6 https://packages.cloud.google.com/apt google-compute-engine-buster InRelease
Get:7 https://packages.cloud.google.com/apt google-compute-engine-buster Sources [944 B]
Fetched 944 B in 0s (1.0 kB/s)
901 | 28 M  | executive | LIVW
902 | 28 M  | student   | 10000
903 | 28 M  | educator  | 109850
904 | 27 F  | student   | 101079
905 | 27 M  | other     | 023360
906 | 45 M  | librarian | 70124
907 | 26 F  | other     | 023364
908 | 44 F  | librarian | 68004
909 | 50 F  | educator  | 33171
910 | 50 M  | librarian | 127751
911 | 37 F  | writer    | 53210
912 | 51 M  | other     | 6513
913 | 51 M  | student   | 143001
914 | 44 F  | other     | 8105
915 | 50 M  | entertainment | 69414
916 | 50 M  | other     | 023360
917 | 22 F  | student   | 20006
918 | 25 M  | scientist | 1165
919 | 25 M  | other     | 142105
920 | 30 F  | actress   | 90008
921 | 29 F  | student   | 89401
922 | 29 F  | administrator | 21114
923 | 21 M  | student   | 12238
924 | 21 M  | other     | 1123
925 | 18 F  | salesman | 49036
926 | 49 M  | entertainment | 1701
927 | 23 M  | programmer | 100088
928 | 21 M  | student   | 55408
929 | 44 M  | scientist | 53711
930 | 33 M  | teacher   | 53711
931 | 60 M  | educator  | 33556
932 | 59 M  | educator  | 4747
933 | 28 M  | teacher   | 48105
934 | 61 M  | engineer  | 22902
935 | 24 M  | doctor   | 11121
936 | 24 M  | other     | 32789
937 | 48 M  | educator  | 98672
```

```
VM instances - Compute Engine - danddankics432homew... - Go...
ssh.cloud.google.com

VM instances - Compute Engine - danddankics432homew... - Go...
nalongsone_danddank@danddankhomework1mysql:~$ mysql --local-infile=1 -u root -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 16
Server version: 8.0.26 MySQL Community Server - GPL

Copyright (c) 2000, 2021, Oracle and/or its affiliates.

Oracle is a registered trademark of Oracle Corporation and/or its
affiliates. Other names may be trademarks of their respective
owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql> show databases;
+-----+
| Database      |
+-----+
| information_schema |
| movie_ratings_database |
| mysql          |
| performance_schema |
| sys            |
+-----+
5 rows in set (0.00 sec)

mysql> use movie_ratings_database;
Reading table information for completion of table and column names
You can turn off this feature to get a quicker startup with -A

Database changed
mysql> show tables;
+-----+
| Tables_in_movie_ratings_database |
+-----+
| items        |
| ratings      |
| users        |
+-----+
3 rows in set (0.00 sec)

mysql> CREATE TABLE items(movieid int primary key, movietitle varchar(1000), releasedate varchar(50), video
rel_date varchar(50), IMDb_URL varchar(500), unknown tinyint(1), action tinyint(1), adventure tinyint(1), an
imation tinyint(1), children tinyint(1), comedy tinyint(1), crime tinyint(1), documentary tinyint(1), drama
tinyint(1), fantasy tinyint(1), film_noir tinyint(1), horror tinyint(1), musical tinyint(1), mystery tinyint(1),
romance tinyint(1), scifi tinyint(1), thriller tinyint(1), war tinyint(1), western tinyint(1));
```

```
VM instances - Compute Engine - danddankics432homew... - Goo... ssh.cloud.google.com nalongsone_danddank@danddankhomework1mysql:~$ mysql --local-infile=1 -u root -p Enter password: Welcome to the MySQL monitor. Commands end with ; or \g. Your MySQL connection id is 16 Server version: 8.0.26 MySQL Community Server - GPL Copyright (c) 2000, 2021, Oracle and/or its affiliates. Oracle is a registered trademark of Oracle Corporation and/or its affiliates. Other names may be trademarks of their respective owners. Type 'help;' or '\h' for help. Type '\c' to clear the current input statement. mysql> show databases; +-----+ | Database | +-----+ | information_schema | | movie_ratings_database | | mysql | | performance_schema | | sys | +-----+ 5 rows in set (0.00 sec) mysql> use movie_ratings_database; Reading table information for completion of table and column names You can turn off this feature to get a quicker startup with -A Database changed mysql> show tables; +-----+ | Tables_in_movie_ratings_database | +-----+ | items | | ratings | | users | +-----+ 3 rows in set (0.00 sec) mysql> CREATE TABLE ratings(userid int not null, movieid int not null, rating int, timestamp varchar(100), C ONSTRAINT PK_rating (userid, movieid), FOREIGN KEY(userid) REFERENCES users(userid), FOREIGN KEY(movieid) RE FERENCES items(movieid));
```

```
VM instances - Compute Engine - danddankics432homew... - Goo... ssh.cloud.google.com nalongsone_danddank@danddankhomework1mysql:~$ mysql --local-infile=1 -u root -p Enter password: Database changed mysql> show tables; +-----+ | Tables_in_movie_ratings_database | +-----+ | items | | ratings | | users | +-----+ 3 rows in set (0.00 sec) mysql> DESC items; +-----+-----+-----+-----+-----+-----+ | Field | Type | Null | Key | Default | Extra | +-----+-----+-----+-----+-----+-----+ | movieid | int | NO | PRI | NULL | | | movietitle | varchar(1000) | YES | NULL | NULL | | | releasedate | varchar(50) | YES | NULL | NULL | | | video_rel_date | varchar(50) | YES | NULL | NULL | | | IMDb_URL | varchar(500) | YES | NULL | NULL | | | unknown | tinyint(1) | YES | NULL | NULL | | | action | tinyint(1) | YES | NULL | NULL | | | adventure | tinyint(1) | YES | NULL | NULL | | | animation | tinyint(1) | YES | NULL | NULL | | | children | tinyint(1) | YES | NULL | NULL | | | comedy | tinyint(1) | YES | NULL | NULL | | | crime | tinyint(1) | YES | NULL | NULL | | | documentary | tinyint(1) | YES | NULL | NULL | | | drama | tinyint(1) | YES | NULL | NULL | | | fantasy | tinyint(1) | YES | NULL | NULL | | | film_noir | tinyint(1) | YES | NULL | NULL | | | horror | tinyint(1) | YES | NULL | NULL | | | musical | tinyint(1) | YES | NULL | NULL | | | mystery | tinyint(1) | YES | NULL | NULL | | | romance | tinyint(1) | YES | NULL | NULL | | | sci-fi | tinyint(1) | YES | NULL | NULL | | | thriller | tinyint(1) | YES | NULL | NULL | | | war | tinyint(1) | YES | NULL | NULL | | | western | tinyint(1) | YES | NULL | NULL | +-----+-----+-----+-----+-----+-----+ 24 rows in set (0.00 sec) mysql>
```

```

ssh.cloud.google.com
VM instances - Compute Engine - danddankics432homew... - Goo...
nalongsonे_danddank@danddankhomework1mysql: ~

+-----+-----+-----+-----+
| movieid | int   | NO    | PRI  | NULL   |
| movieTitle | varchar(1000) | YES   |      | NULL   |
| releasedate | varchar(50) | YES   |      | NULL   |
| video_rel_date | varchar(50) | YES   |      | NULL   |
| IMDb_URL | varchar(500) | YES   |      | NULL   |
| unknown | tinyint(1) | YES   |      | NULL   |
| action | tinyint(1) | YES   |      | NULL   |
| adventure | tinyint(1) | YES   |      | NULL   |
| animation | tinyint(1) | YES   |      | NULL   |
| children | tinyint(1) | YES   |      | NULL   |
| comedy | tinyint(1) | YES   |      | NULL   |
| crime | tinyint(1) | YES   |      | NULL   |
| documentary | tinyint(1) | YES   |      | NULL   |
| drama | tinyint(1) | YES   |      | NULL   |
| fantasy | tinyint(1) | YES   |      | NULL   |
| film_noir | tinyint(1) | YES   |      | NULL   |
| horror | tinyint(1) | YES   |      | NULL   |
| musical | tinyint(1) | YES   |      | NULL   |
| mystery | tinyint(1) | YES   |      | NULL   |
| romance | tinyint(1) | YES   |      | NULL   |
| scifi | tinyint(1) | YES   |      | NULL   |
| thriller | tinyint(1) | YES   |      | NULL   |
| war | tinyint(1) | YES   |      | NULL   |
| western | tinyint(1) | YES   |      | NULL   |
+-----+-----+-----+-----+
24 rows in set (0.00 sec)

mysql> desc ratings;
+-----+-----+-----+-----+
| Field | Type  | Null | Key | Default | Extra |
+-----+-----+-----+-----+
| userid | int   | NO    | PRI  | NULL   |
| movieid | int   | NO    | PRI  | NULL   |
| rating | int   | YES   |      | NULL   |
| timestamp | varchar(100) | YES   |      | NULL   |
+-----+-----+-----+-----+
4 rows in set (0.00 sec)

mysql> desc users;
+-----+-----+-----+-----+
| Field | Type  | Null | Key | Default | Extra |
+-----+-----+-----+-----+
| userid | int   | NO    | PRI  | NULL   |
| age | int   | YES   |      | NULL   |
| gender | varchar(5) | YES   |      | NULL   |
| occupation | varchar(100) | YES   |      | NULL   |
| zipcode | varchar(10) | YES   |      | NULL   |
+-----+-----+-----+-----+
5 rows in set (0.00 sec)

mysql> 
```

## Homework report screen-shot #21: *99548 rows in the rating table*

```

ssh.cloud.google.com
VM instances - Compute Engine - danddankics432homew... - Goo...
nalongsonе_данданк@данданкhomework1mysql: ~
nalongsonе_данданк@данданкhomework1mysql: ~$ mysql --local-infile=1 -u root -p
Enter password:
Welcome to the MySQL monitor. Commands end with ; or \g.
Your MySQL connection id is 16
Server version: 8.0.26 MySQL Community Server - GPL

Copyright (c) 2000, 2021, Oracle and/or its affiliates.

Oracle is a registered trademark of Oracle Corporation and/or its
affiliates. Other names may be trademarks of their respective
owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql> show databases;
+-----+
| Database |
+-----+
| information schema |
| movie_ratings_database |
| mysql |
| performance_schema |
| sys |
+-----+
5 rows in set (0.00 sec)

mysql> use movie_ratings_database;
Reading table information for completion of table and column names
You can turn off this feature to get a quicker startup with -A

Database changed
mysql> show tables;
+-----+
| Tables_in_movie_ratings_database |
+-----+
| items |
| ratings |
| users |
+-----+
3 rows in set (0.00 sec)

mysql> CREATE TABLE ratings(userid int not null, movieid int not null, rating int, timestamp varchar(100), PRIMARY KEY(userid, movieid), FOREIGN KEY(userid) REFERENCES users(userid), FOREIGN KEY(movieid) REFERENCES items(movieid));
```

## Homework report screen-shot #22: *1682 rows in the items table*

## **Homework report screen-shot #23:**

1- Find how many ratings are there for each of the following values (5,4,3,2, and 1). Draw a histogram to show these values

The screenshot shows a terminal window titled 'VM instances - Compute Engine - danddankics432homew... - Google Cloud Platform' connected via ssh to 'nalongsone\_danddankhomework!mysql'. The MySQL prompt is visible at the bottom. The terminal displays several SQL queries using the 'count(\*)' function to determine the number of rows for each rating value (1, 2, 3, 4, 5) in the 'ratings' table of the 'movie\_ratings\_database'. The results are as follows:

```
mysql> select count(*) from ratings where rating=1;
+-----+
| count(*) |
+-----+
| 6102 |
+-----+
1 row in set (0.02 sec)

mysql> select count(*) from ratings where rating=2;
+-----+
| count(*) |
+-----+
| 11343 |
+-----+
1 row in set (0.02 sec)

mysql> select count(*) from ratings where rating=3;
+-----+
| count(*) |
+-----+
| 27049 |
+-----+
1 row in set (0.02 sec)

mysql> select count(*) from ratings where rating=4;
+-----+
| count(*) |
+-----+
| 33972 |
+-----+
1 row in set (0.02 sec)

mysql> select count(*) from ratings where rating=5;
+-----+
| count(*) |
+-----+
| 21082 |
+-----+
1 row in set (0.02 sec)

mysql>
```

Rating	Number of rating
1	6102
2	11343
3	27049
4	33972
5	21082

### Homework report screen-shot #24:

2- Find how many distinct zip codes are there: 795

## **Homework report screen-shot #25:**

3- Find how many users are there from each zip code.

```
ssh.cloud.google.com
VM instances - Compute Engine - danddankics432homew... - Google Cloud Platform
nalongson_danddank@danddankhomework1mysql: ~

1 row in set (0.00 sec)

mysql> select zipcode, count(userid) from users group by zipcode order by zipcode limit 20;
+-----+-----+
| zipcode | count(userid) |
+-----+-----+
| 0       | 2           |
| 10003   | 5           |
| 10010   | 1           |
| 10011   | 1           |
| 10016   | 2           |
| 10018   | 1           |
| 10019   | 2           |
| 1002    | 1           |
| 10021   | 3           |
| 10022   | 2           |
| 10025   | 2           |
| 10309   | 1           |
| 10314   | 1           |
| 1040    | 1           |
| 10522   | 1           |
| 10707   | 1           |
| 1080    | 1           |
| 10960   | 2           |
| 11101   | 1           |
| 11201   | 1           |
+-----+
20 rows in set (0.00 sec)

mysql> 
```

```

+-----+-----+
| 29301 |      1 |
| 53210 |      1 |
| 6512  |      1 |
| 76201 |      1 |
| 8105  |      1 |
| 60614 |      1 |
| N2L5N |      1 |
| 20006 |      1 |
| 70116 |      1 |
| 90008 |      1 |
| 98801 |      1 |
| E2E3R |      1 |
| 11753  |      1 |
| 49036 |      1 |
| 1701   |      1 |
| 55428  |      1 |
| 7310   |      1 |
| 33556  |      1 |
| 6437   |      1 |
| 48105 |      1 |
| 66221  |      1 |
| 32789  |      1 |
| 55038  |      1 |
| 33319  |      1 |
| 97229  |      1 |
| 78209  |      1 |
| 77841  |      1 |
+-----+
795 rows in set (0.00 sec)

mysql> 
```

### Homework report screen-shot #26:

4- What is the age and occupation of the user who gave the maximum number of reviews?

`select userid, age, occupation from users where users.userid = (select userid from ratings group by userid order by count(userid) desc limit 1);`

```

+-----+-----+
| userid | age   | occupation |
+-----+-----+
| 405   | 22    | healthcare |
+-----+
1 row in set (0.02 sec)

mysql> select userid, count(userid)as num from ratings group by userid order by num desc limit 10;
+-----+-----+
| userid | num  |
+-----+-----+
| 405   | 737  |
| 655   | 684  |
| 13    | 635  |
| 450   | 539  |
| 276   | 517  |
| 416   | 492  |
| 537   | 489  |
| 303   | 483  |
| 234   | 479  |
| 393   | 447  |
+-----+-----+
10 rows in set (0.02 sec)

mysql> select userid, age, occupation from users where users.userid = (select userid from ratings group by userid order by count(userid) desc limit 1);
+-----+-----+
| userid | age   | occupation |
+-----+-----+
| 405   | 22    | healthcare |
+-----+
1 row in set (0.02 sec)

mysql> 
```

### Homework report screen-shot #27:

5- What are the top five zip codes in terms of number of users? How many users are there in each one of these zip codes.

`select zipcode, count(zipcode) as num_user from users group by zipcode order by num_user desc limit 5;`

```
ssh.cloud.google.com
VM instances - Compute Engine - danddankics432...
nalongsonen_danddank@danddankhomework1mysql: ~
SSH from the browser | Compute Engine Document...
20009 | 5 |
55337 | 5 |
10003 | 5 |
55408 | 4 |
27514 | 4 |
55454 | 4 |
2215 | 3 |
55108 | 3 |
55113 | 3 |
11217 | 3 |
97301 | 3 |
55106 | 3 |
80525 | 3 |
60201 | 3 |
22903 | 3 |
22902 | 3 |
48103 | 3 |
94043 | 3 |
+-----+
20 rows in set (0.00 sec)

mysql> select zipcode, count(zipcode) as num_user from users group by zipcode order by num_user desc limit 5;
+-----+-----+
| zipcode | num_user |
+-----+-----+
| 55414 | 9 |
| 55105 | 6 |
| 20009 | 5 |
| 55337 | 5 |
| 10003 | 5 |
+-----+
5 rows in set (0.00 sec)

mysql> ■
```

### Homework report screen-shot #28:

6- Find how many different occupations are there. -> 21

[select count\(distinct\(occupation\)\) from users;](#)

```
ssh.cloud.google.com
VM instances - Compute Engine - danddankics432...
nalongsonen_danddank@danddankhomework1mysql: ~
SSH from the browser | Compute Engine Document...
mysql> select distinct(occupation) from users;
+-----+
| occupation |
+-----+
| technician |
| other |
| writer |
| executive |
| administrator |
| student |
| lawyer |
| educator |
| scientist |
| entertainment |
| programmer |
| librarian |
| homemaker |
| artist |
| engineer |
| marketing |
| none |
| healthcare |
| retired |
| salesman |
| doctor |
+-----+
21 rows in set (0.00 sec)

mysql> select count(distinct(occupation)) from users;
+-----+
| count(distinct(occupation)) |
+-----+
| 21 |
+-----+
1 row in set (0.00 sec)

mysql> ■
```

### Homework report screen-shot #29:

7- What are the five top occupations in terms of the number of users? How many users are there in each one of these top five occupations?

```
select occupation, count(occupation) as num_user from users group by occupation order by num_user desc limit 5;
```

The screenshot shows an SSH session on a Compute Engine VM. The user has run several MySQL commands:

- A `DESCRIBE` command on the `users` table.
- A query to count the distinct occupations.
- A query to select the top 5 occupations by user count, ordered by `num\_user` in descending order.

```
| scientist      |
| entertainment |
| programmer    |
| librarian     |
| homemaker     |
| artist         |
| engineer       |
| marketing     |
| none           |
| healthcare    |
| retired        |
| salesman       |
| doctor          |
+-----+
21 rows in set (0.00 sec)

mysql> select count(distinct(occupation)) from users;
+-----+
| count(distinct(occupation)) |
+-----+
|                      21 |
+-----+
1 row in set (0.00 sec)

mysql> select occupation, count(occupation) as num_user from users group by occupation
   order by num_user desc limit 5;
+-----+-----+
| occupation | num_user |
+-----+-----+
| student    |     196 |
| other      |     105 |
| educator   |      95 |
| administrator |    79 |
| engineer   |      67 |
+-----+-----+
5 rows in set (0.00 sec)

mysql> 
```

### Homework report screen-shot #30:

8- What are the top five movie ids in terms of the number of ratings.

```
select movieid, count(movieid) as num_rating from ratings group by movieid order by num_rating desc limit 5;
```

The screenshot shows an SSH session on a Compute Engine VM. The user has run several MySQL commands:

- A query to select the top 5 movie IDs based on the count of ratings.
- A query to select the first 5 rows from the `ratings` table.
- A query to select movie IDs and their counts, grouped by movie ID, ordered by the count in descending order. This query results in an error due to a syntax issue with the `GROUP BY` clause.
- A corrected version of the previous query that works correctly.

```
| educator |    95 |
| administrator |  79 |
| engineer |   67 |
+-----+
5 rows in set (0.00 sec)

mysql> select * from ratings limit 5;
+-----+-----+-----+-----+
| userid | movieid | rating | timestamp |
+-----+-----+-----+-----+
|     1 |      2 |     3 | 876893171
|     1 |      3 |     4 | 878542960
|     1 |      4 |     3 | 876893119
|     1 |      5 |     3 | 889751712
|     1 |      6 |     5 | 887431973
+-----+-----+-----+-----+
5 rows in set (0.00 sec)

mysql> select movieid, count(userid) as num_rating from ratings group by userid order by num_rating desc limit 5;
ERROR 1055 (42000): Expression #1 of SELECT list is not in GROUP BY clause and contains nonaggregated column 'movie_ratings.database.ratings.movieid' which is not functionally dependent on columns in GROUP BY clause; this is incompatible with sql_mode=only_full_group_by
mysql> select movieid, count(movieid) as num_rating from ratings group by movieid order by num_rating desc limit 5;
+-----+-----+
| movieid | num_rating |
+-----+-----+
|     50 |      583 |
|    258 |      509 |
|    100 |      508 |
|    181 |      507 |
|    294 |      485 |
+-----+-----+
5 rows in set (0.02 sec)

mysql> 
```

**Homework report screen-shot #31:**

9- Find the top ten movie ids in terms of average rating? What are the titles for these movies. You can use more than one query.

```
create view mid_tnr as select movieid, count(movieid) as num_rating from ratings group by movieid order by movieid;
```

```
create view mid_rxn as select movieid, rating, count(movieid) as num_rating,(rating * count(movieid)) as rxn from ratings group by movieid, rating order by movieid;
```

```
create view mid_rxn_sum as select movieid, sum(rxn) as sum_rxn from mid_rxn group by movieid;
```

```
create view tnr_join_rxns as select mid_tnr.movieid, sum_rxn, num_rating from mid_rxn_sum join mid_tnr on mid_rxn_sum.movieid = mid_tnr.movieid;
```

```
create view mid_avr as select movieid, sum_rxn, num_rating, (sum_rxn/num_rating) as average_rating from tnr_join_rxns order by average_rating desc;
```

```
create view mid_avr_title as (select mid_avr.movieid, movietitle, sum_rxn, num_rating, average_rating from mid_avr join items on mid_avr.movieid = items.movieid order by average_rating desc, num_rating desc);
```

```
select movieid, movietitle, average_rating from mid_avr_title limit 10;
```

movieid	movietitle	average_rating
1189	Prefontaine (1997)	5.0000
1293	Star Kid (1997)	5.0000
1467	"Saint of Fort Washington	5.0000
1500	Santa with Muscles (1996)	5.0000
814	"Great Day in Harlem	5.0000
1201	Marlene Dietrich: Shadow and Light (1996)	5.0000
1653	Entertaining Angels: The Dorothy Day Story (1996)	5.0000
1599	Someone Else's America (1995)	5.0000
1122	They Made Me a Criminal (1939)	5.0000
1536	Aiqing wansui (1994)	5.0000

```

ssh.cloud.google.com
VM instances - Compute Engine - danddankics432homew... - Google Cloud Platform
nalongsonc_danddank@danddankhomework1:mysql> id_avr join items on mid_avr.movieid = items.movieid order by average_rating desc, num_rating desc);
Query OK, 0 rows affected (0.01 sec)

mysql> select * from mid_avr_title limit 10;
+-----+-----+-----+-----+
| movieid | movietitle | sum_rxn | num_rating | average_rating |
+-----+-----+-----+-----+
| 1189 | Prefontaine (1997) | 15 | 3 | 5.0000 |
| 1293 | Star Kid (1997) | 15 | 3 | 5.0000 |
| 1467 | "Saint of Fort Washington | 10 | 2 | 5.0000 |
| 1500 | Santa with Muscles (1996) | 10 | 2 | 5.0000 |
| 814 | "Great Day in Harlem | 5 | 1 | 5.0000 |
| 1201 | Marlene Dietrich: Shadow and Light (1996) | 5 | 1 | 5.0000 |
| 1653 | Entertaining Angels: The Dorothy Day Story (1996) | 5 | 1 | 5.0000 |
| 1599 | Someone Else's America (1995) | 5 | 1 | 5.0000 |
| 1122 | They Made Me a Criminal (1939) | 5 | 1 | 5.0000 |
| 1536 | Aiqing wansui (1994) | 5 | 1 | 5.0000 |
+-----+-----+-----+-----+
10 rows in set (0.10 sec)

mysql> select movieid, movietitle, average_rating from mid_avr_title limit 10;
+-----+-----+-----+
| movieid | movietitle | average_rating |
+-----+-----+-----+
| 1189 | Prefontaine (1997) | 5.0000 |
| 1293 | Star Kid (1997) | 5.0000 |
| 1467 | "Saint of Fort Washington | 5.0000 |
| 1500 | Santa with Muscles (1996) | 5.0000 |
| 814 | "Great Day in Harlem | 5.0000 |
| 1201 | Marlene Dietrich: Shadow and Light (1996) | 5.0000 |
| 1653 | Entertaining Angels: The Dorothy Day Story (1996) | 5.0000 |
| 1599 | Someone Else's America (1995) | 5.0000 |
| 1122 | They Made Me a Criminal (1939) | 5.0000 |
| 1536 | Aiqing wansui (1994) | 5.0000 |
+-----+-----+-----+
10 rows in set (0.09 sec)

mysql>

```

## Homework report screen-shot #32:

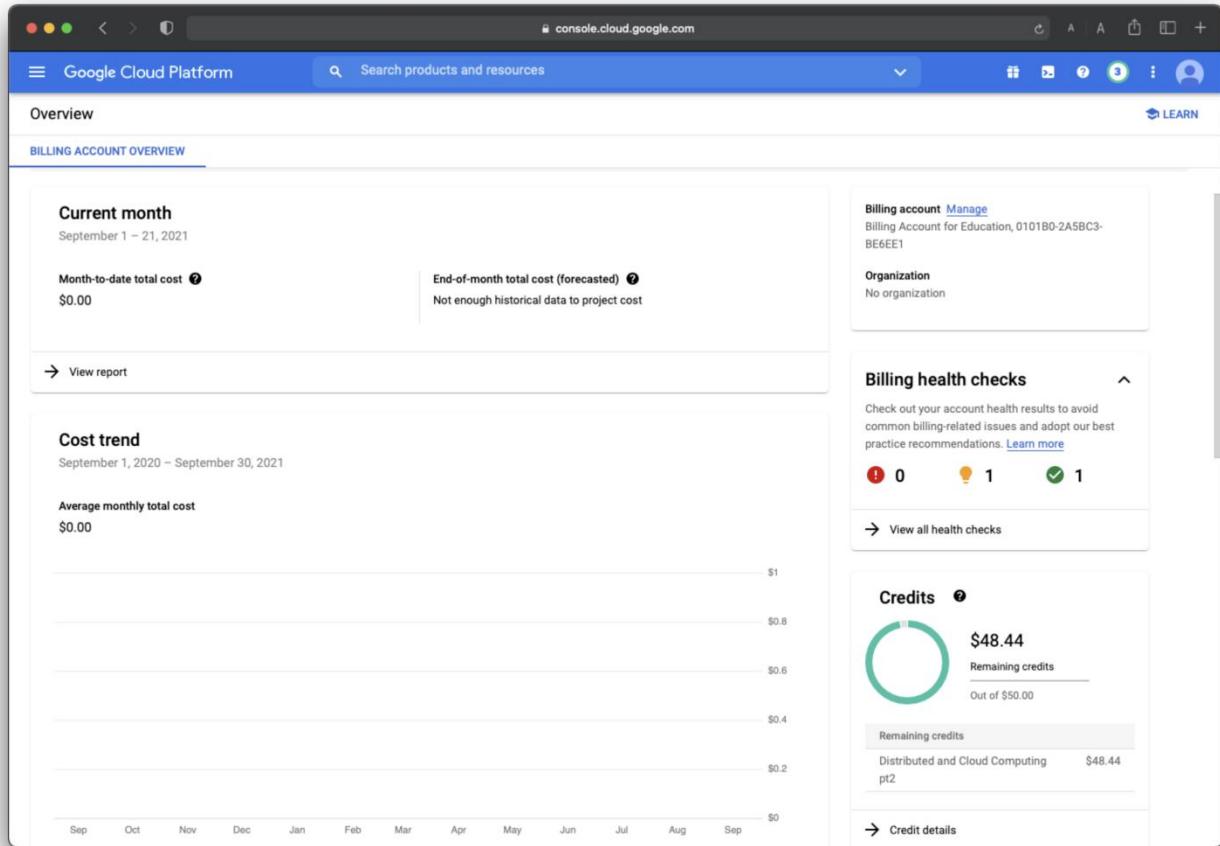
The screenshot shows the Google Cloud Platform Compute Engine interface. The left sidebar navigation includes:

- Compute Engine** (selected)
- Virtual machines** (selected)
  - VM instances** (selected)
  - Instance templates
  - Sole-tenant nodes
  - Machine images
  - TPUs
  - Committed use discounts
  - Migrate for Compute Engi...
- Storage
- Instance groups
- VM Manager

The main content area displays the details for the VM instance `danddankhomework1mysql`. Key sections include:

- Details** tab (selected): Shows the instance ID (445321256354140480), machine type (e2-medium (2 vCPUs, 4 GB memory)), and creation time (Sep 19, 2021, 3:07:11 AM).
- Network interfaces**: Shows a single interface named `nic0` with network `default`, subnetwork `default`, primary internal IP `10.128.0.2`, and external IP `Ephemeral`.
- Public DNS PTR Record**: Shows the PTR record for the instance.

## Homework report screen-shot #33:



### Summarize your learning:

I have learned to create and launch a VM instance on GCP by web page and terminal command line SSH on the web page command line interface, and learned how to set up MySQL server on the virtual machine of Linux which I have created, then fill tables with a data set about movie reviews. After that, write SQL queries to analyze a movie-rating data set. Finally, I have to stop the VM instance to terminate the cost for my account bill.

The most important thing is I have familiar with VM instance GCP virtual machine that is every significant concept of current technology and most popular use to analyze big data and other like machine learning and data analyze for data science.

I think the most challenge me about working with GCP's VM instance is working on the stable connection of internet to keep connect from my computer to a remote machine on GCP. And I have to write SQL queries with the environment system, Linux, command line and under system file of Linux, that is every challenge for me in the beginning.