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Subject - Networkprogramming

Summary -
I have created a google cloud account and created a vm instance
Apart from that I have made a simple blog writing web application using basic web technologies html,css,javascript ,nodejs and mongodbasits database.

so In this report I am going to write about three things
A) How I create vm instance on google cloud and run client sever program overthere.
B) how I have deployed**database**of **Blog writing web application** on mongodb cloud server (**ATLAS**).
C) how Ihavedeployed web Application on **HEROKU** cloud webservice.

End results-

Publically accessible URL :
https://fathomless-basin-80101.herokuapp.com/

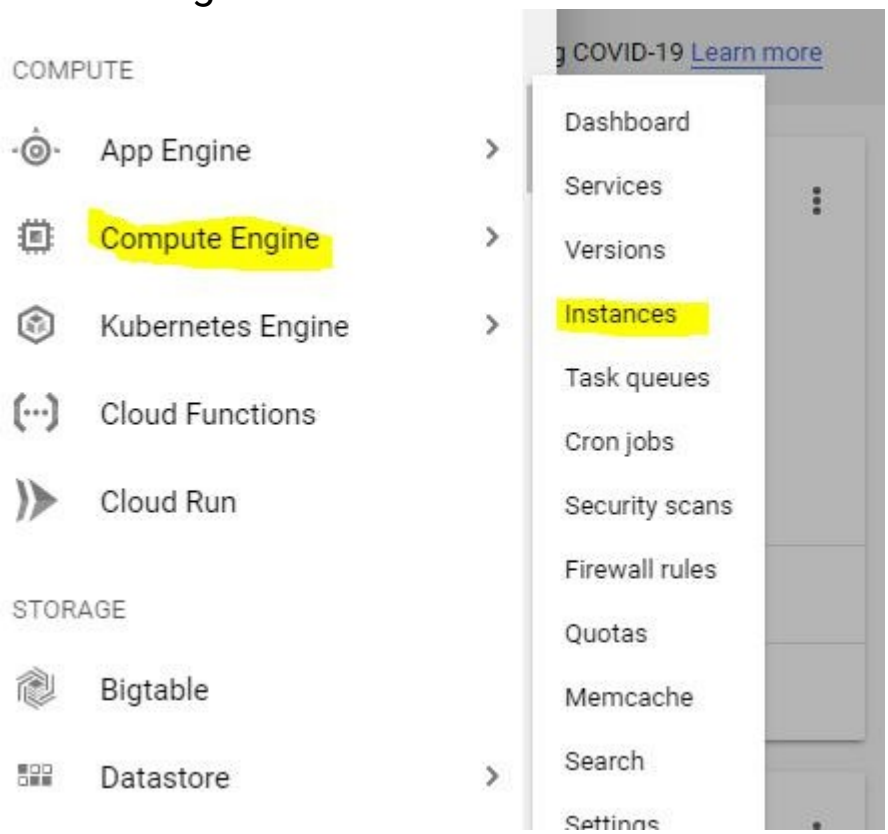
GitHub link for code :

https://github.com/jayprakashkumar123/assignment-3

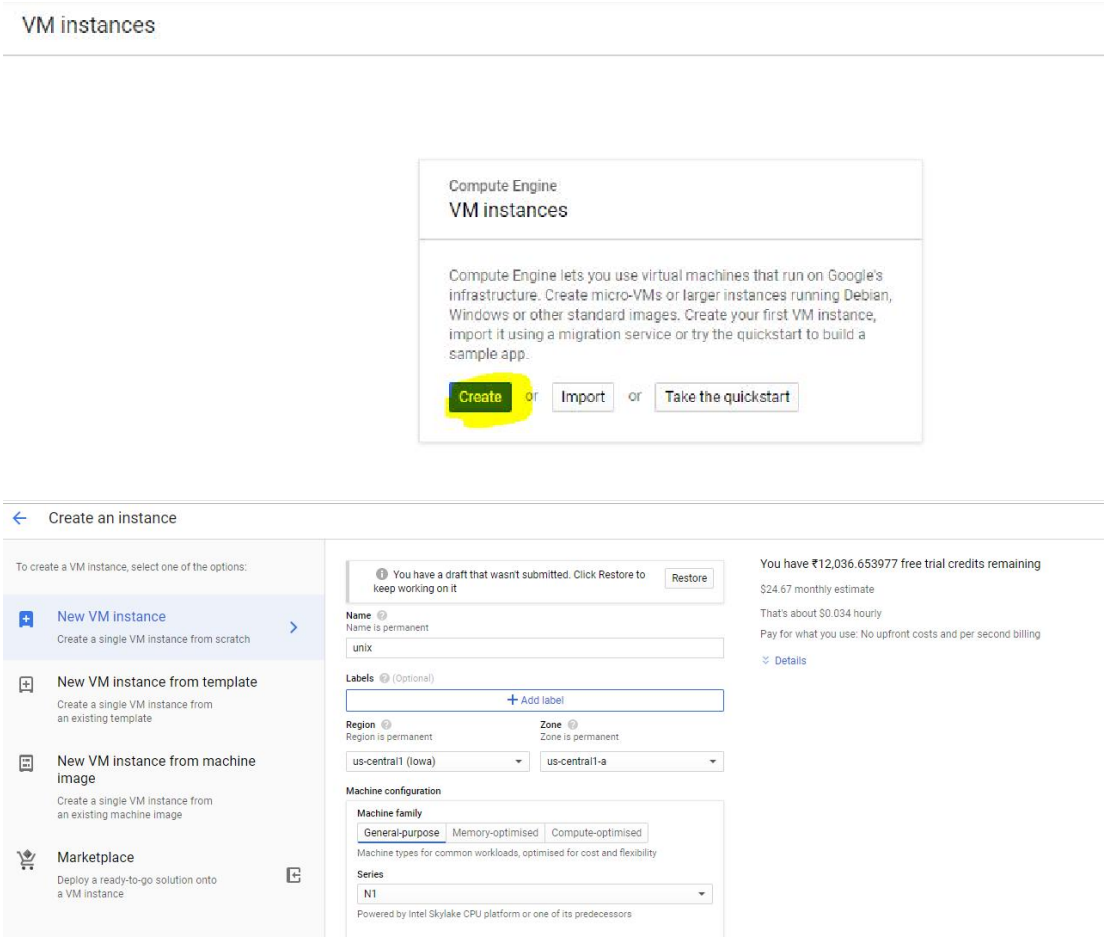
Creating VM instance on google cloud and running unix program on it.

Step1-> create google account.

Step2-> click on **Instances** option present in **compute engine** inside Navigation menu.

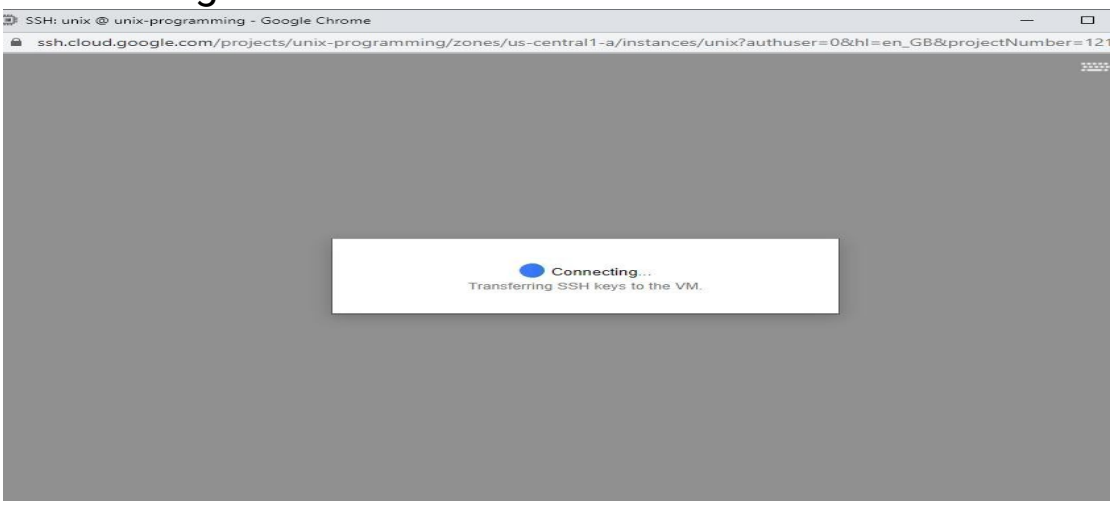


Step3-> Press create and fill the required details to create vm instance.

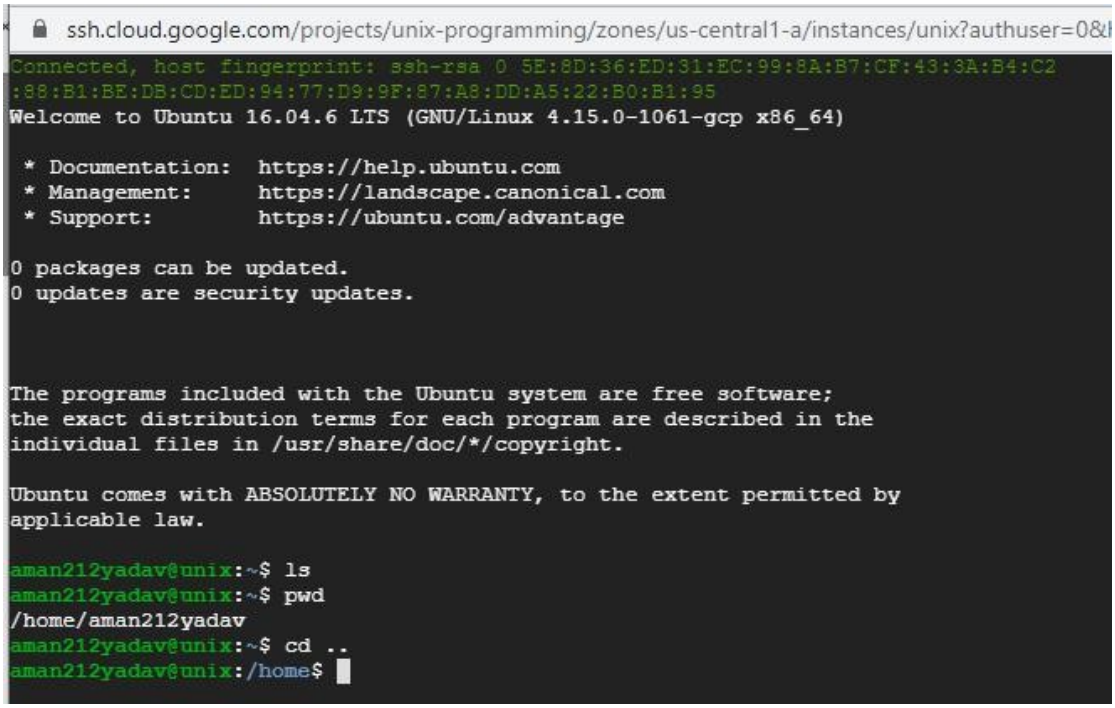


VM instance is ready

Connecting to VM



Running VM



Step4-> writing and executing hello world program on google cloud.

```
client.c  helloWorld.c  server.c
aman212yadav@unix:~$ g++ helloWorld.c
aman212yadav@unix:~$ ./a.out
hello worldaman212yadav@unix:~$
```

Step5-> writing and executing **server.c** file on google cloud.

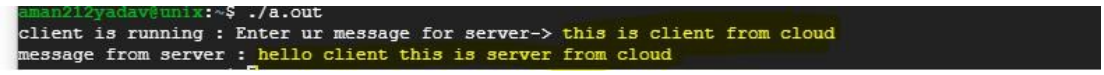
```
hello worldaman212yadav@unix:~$ g++ server.c
server.c: In function 'int main()':
server.c:36:9: warning: 'char* gets(char*)' is deprecated [-Wdeprecated-declarations]
         gets(data);
         ^
In file included from server.c:2:0:
/usr/include/stdio.h:638:14: note: declared here
 extern char *gets (char *__s) __wur __attribute_deprecated__;
              ^
server.c:36:9: warning: 'char* gets(char*)' is deprecated [-Wdeprecated-declarations]
         gets(data);
         ^
In file included from server.c:2:0:
/usr/include/stdio.h:638:14: note: declared here
 extern char *gets (char *__s) __wur __attribute_deprecated__;
              ^
server.c:36:18: warning: 'char* gets(char*)' is deprecated [-Wdeprecated-declarations]
         gets(data);
                  ^
In file included from server.c:2:0:
/usr/include/stdio.h:638:14: note: declared here
 extern char *gets (char *__s) __wur __attribute_deprecated__;
              ^
/tmp/ccCKALdV.o: In function `main':
server.c:(.text+0x148): warning: the `gets' function is dangerous and should not be used.
aman212yadav@unix:~$ ./a.out

server is Running.
```

Step6->Opening separte vm terminal and running **client.c** file

```
aman212yadav@unix:~$ g++ client.c
client.c: In function 'int main()':
client.c:36:5: warning: 'char* gets(char*)' is deprecated [-Wdeprecated-declarations]
     gets(data);
     ^
In file included from client.c:5:0:
/usr/include/stdio.h:638:14: note: declared here
 extern char *gets (char *__s) __wur __attribute_deprecated__;
              ^
client.c:36:5: warning: 'char* gets(char*)' is deprecated [-Wdeprecated-declarations]
     gets(data);
     ^
In file included from client.c:5:0:
/usr/include/stdio.h:638:14: note: declared here
 extern char *gets (char *__s) __wur __attribute_deprecated__;
              ^
client.c:36:14: warning: 'char* gets(char*)' is deprecated [-Wdeprecated-declarations]
     gets(data);
              ^
In file included from client.c:5:0:
/usr/include/stdio.h:638:14: note: declared here
 extern char *gets (char *__s) __wur __attribute_deprecated__;
              ^
/tmp/ccVNUoxD.o: In function `main':
client.c:(.text+0xfd): warning: the `gets' function is dangerous and should not be used.
```

Connection between server and client is established and Message is exchanged successfully .

client



Server

I have attached all the related code on my github account. Link->

https://github.com/jayprakashkumar123/assignment-3

Deploying database of the web application on Mongo Db cloudserver (ATLAS).

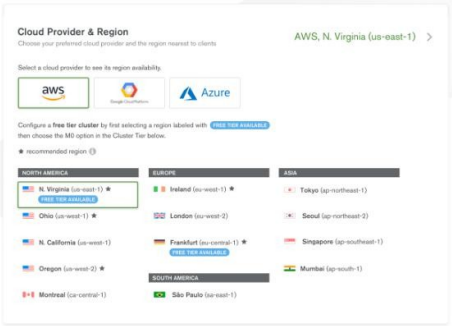
Step 1-> creating a mongoDB atlas account.

MongoDB Atlas

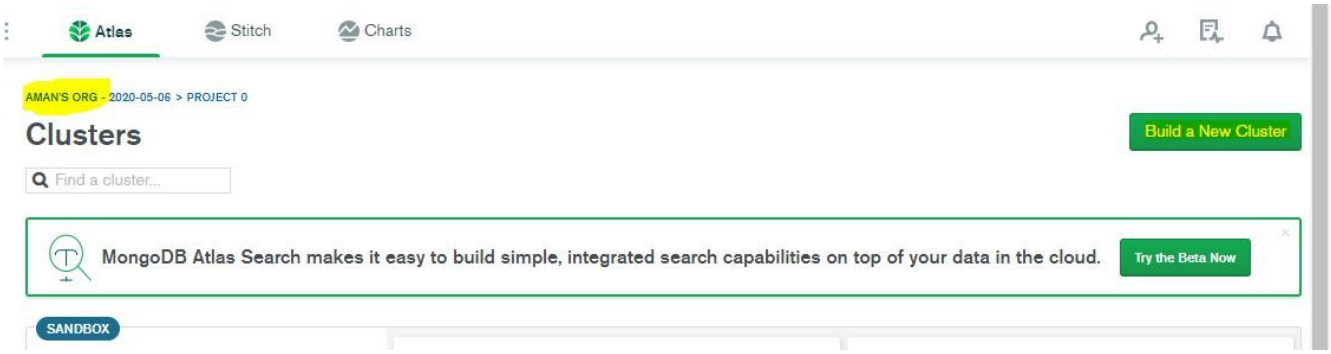
Move faster with a cloud MongoDB service. Built for agile teams who'd rather spend time building apps than managing databases. Available on AWS, Azure, and GCP.

Start free

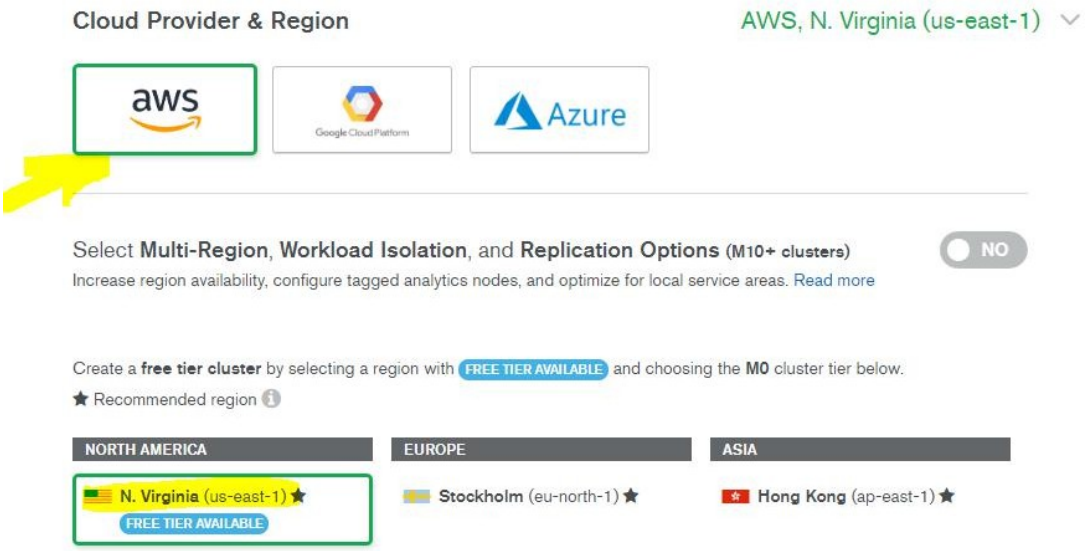
Already have an account? Log in here →



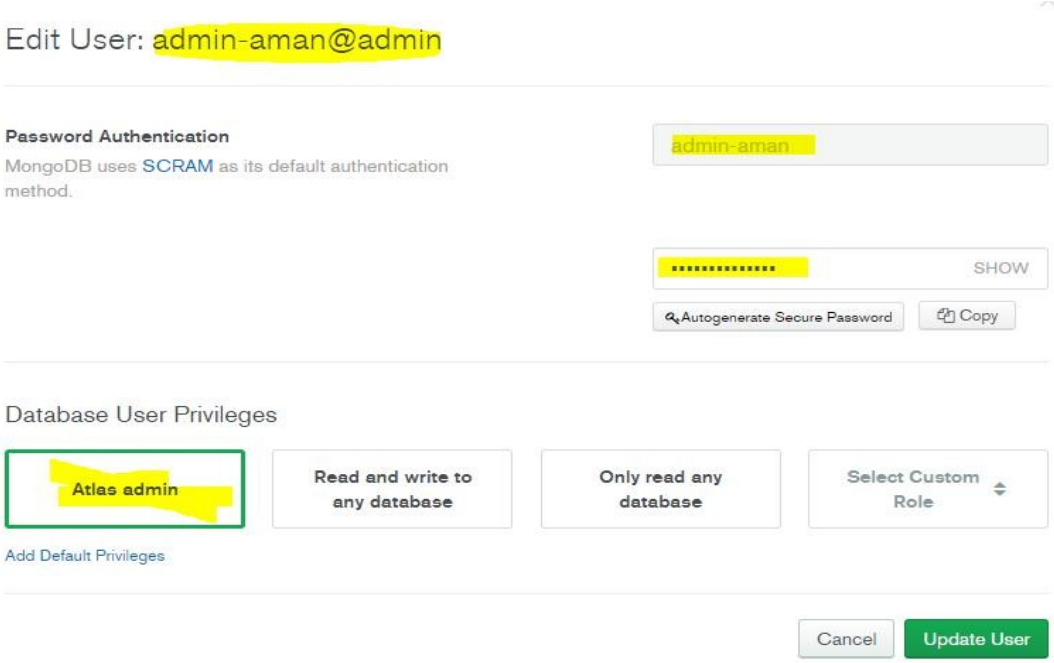
Step 2-> creating a new cluster



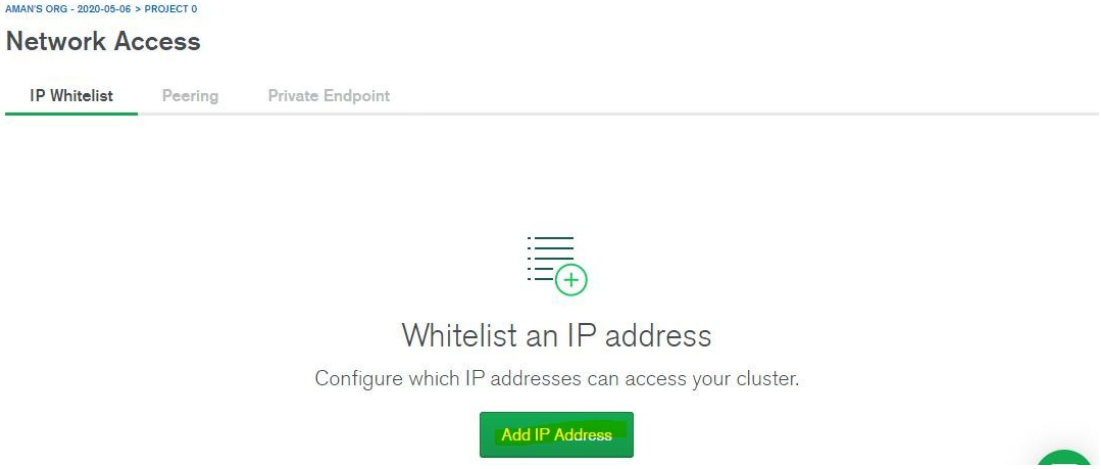
Step 3-> selecting cloud provider.

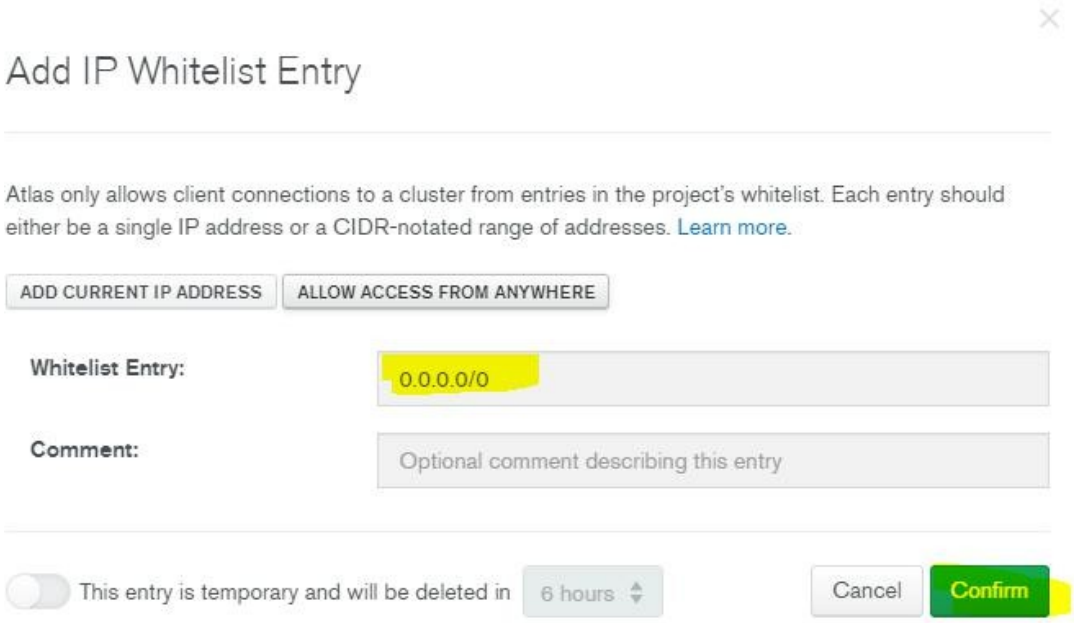


Step 4-> Getting access to database by providing credential.

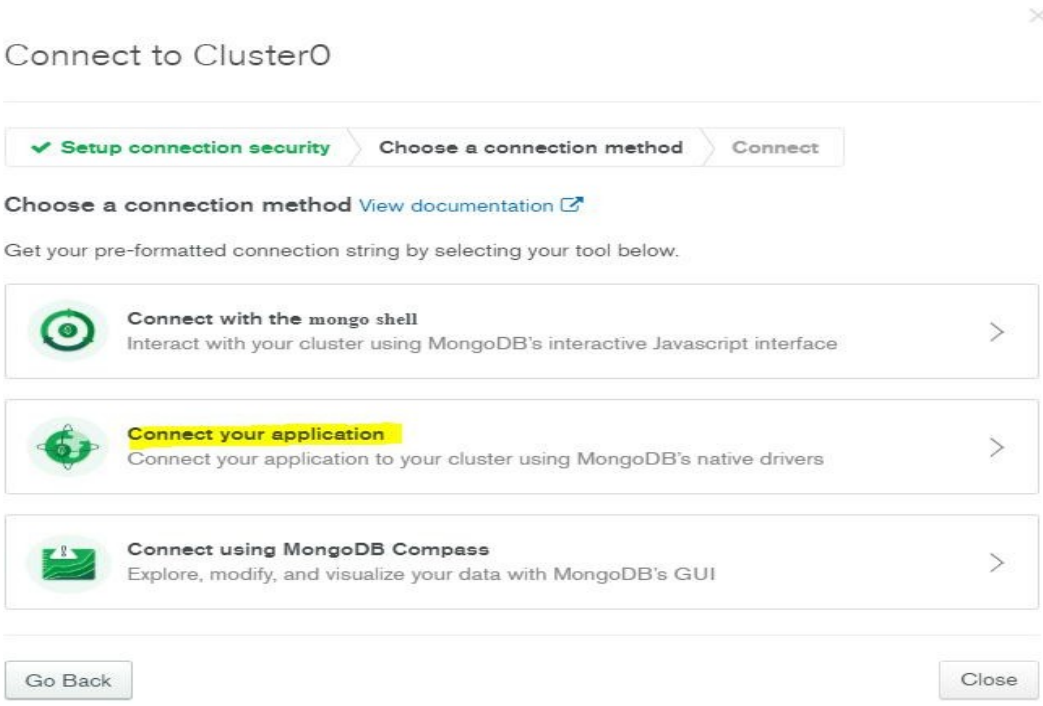


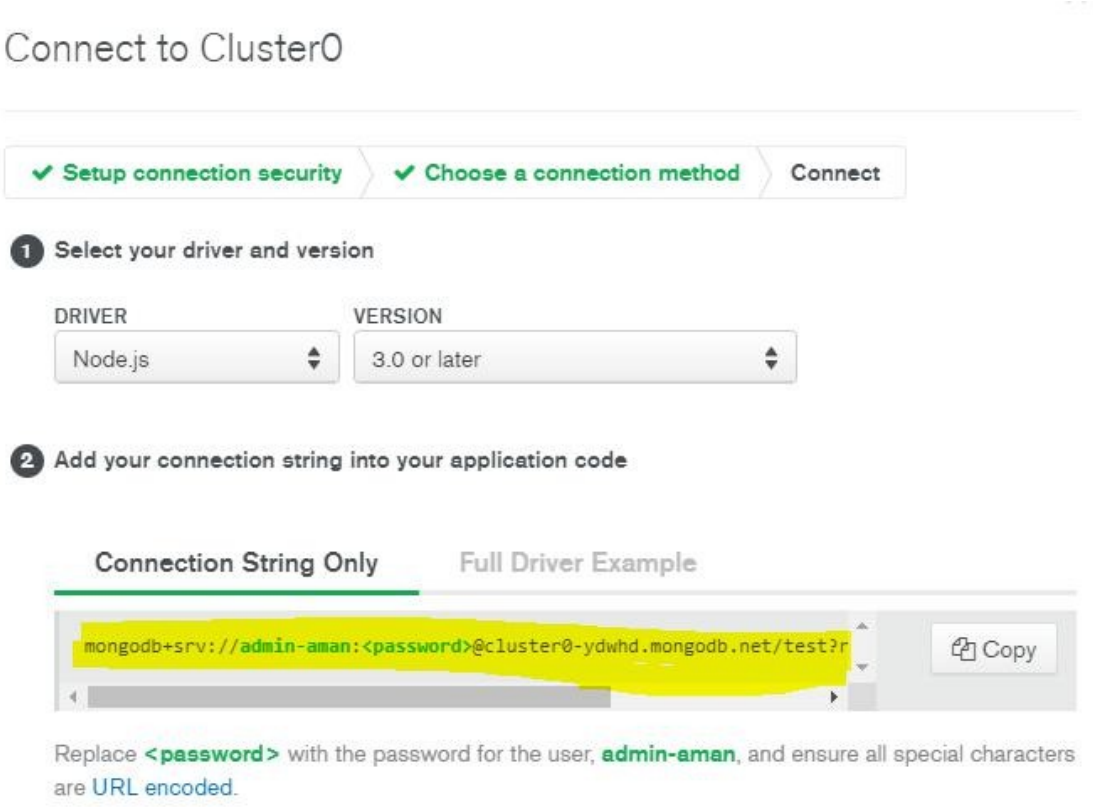
Step 5-> Making it accessible from Anywhere by setting a global IP address (0.0.0.0) .





Step 6-> Generating secure link to connect web application to the hosted database.



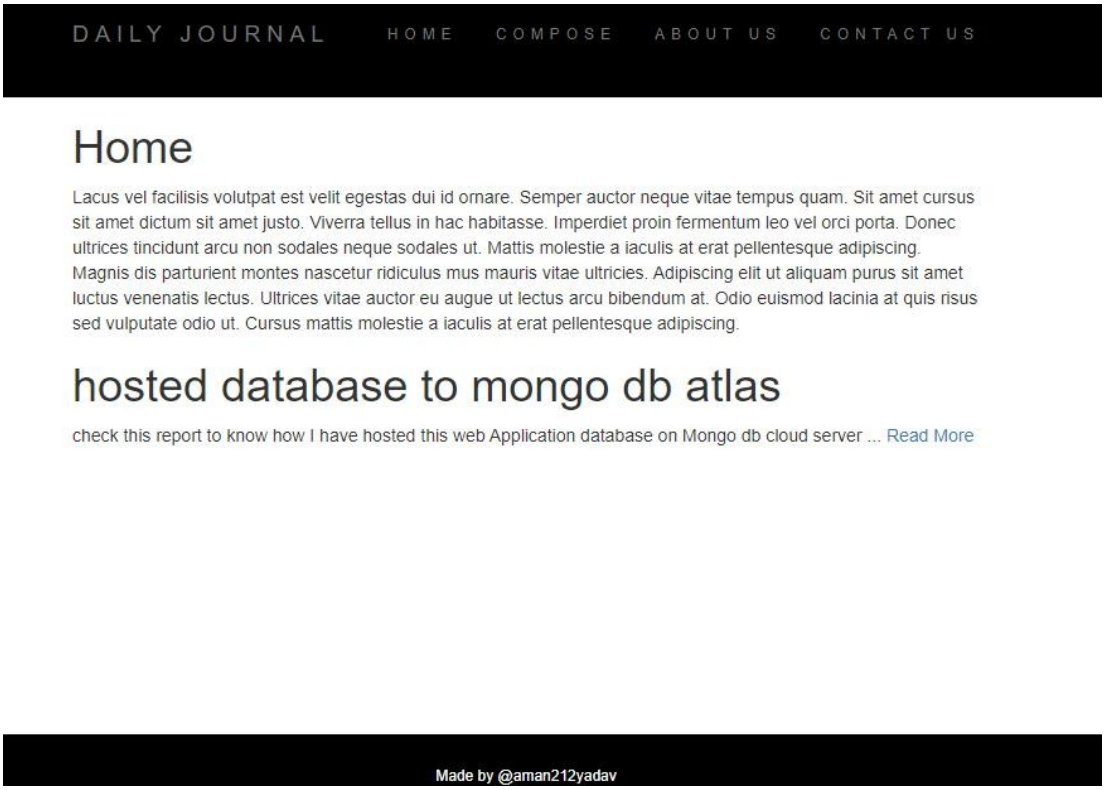


Step 7->Adding the generated link to the web application

```
mongoose.connect('mongodb+srv://admin-[redacted]@cluster0-ydwhd.mongodb.net/blogDB');
```

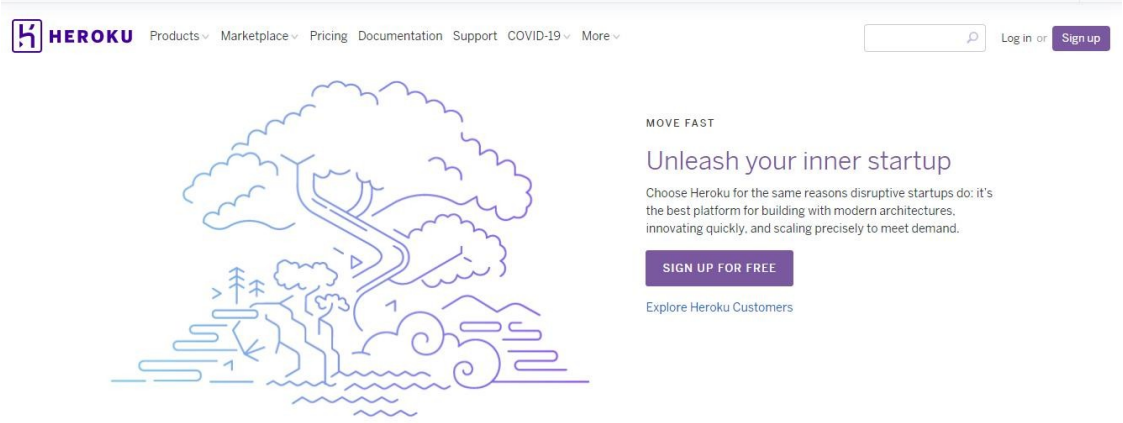
(hiding some information for security reasons)

Step 8->Web application is now able to communicate with database hosted on cloud (ATLAS).

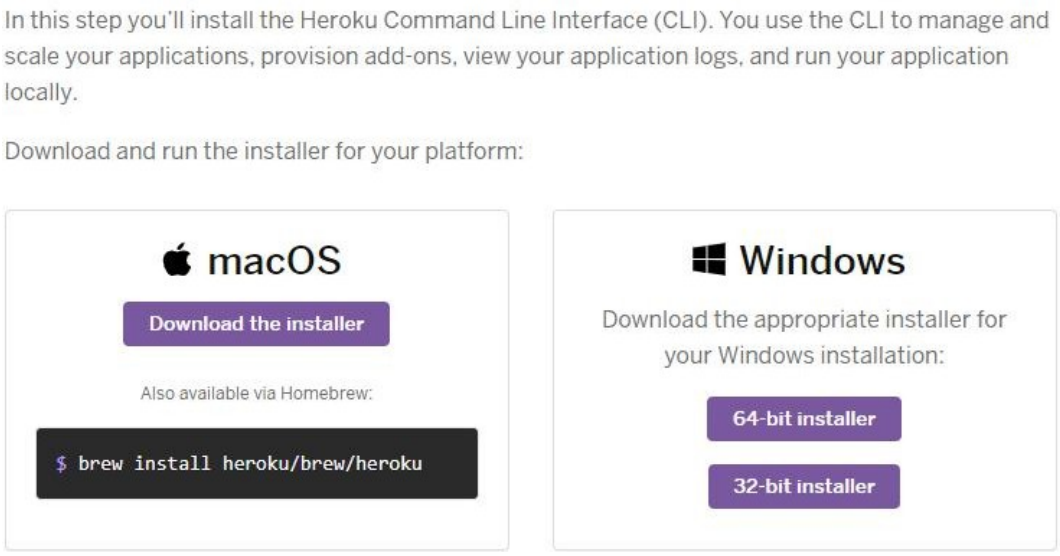


Deploying the Blog writing web application on HEROKU cloud service.

Step 1->Creating a Heroku account.

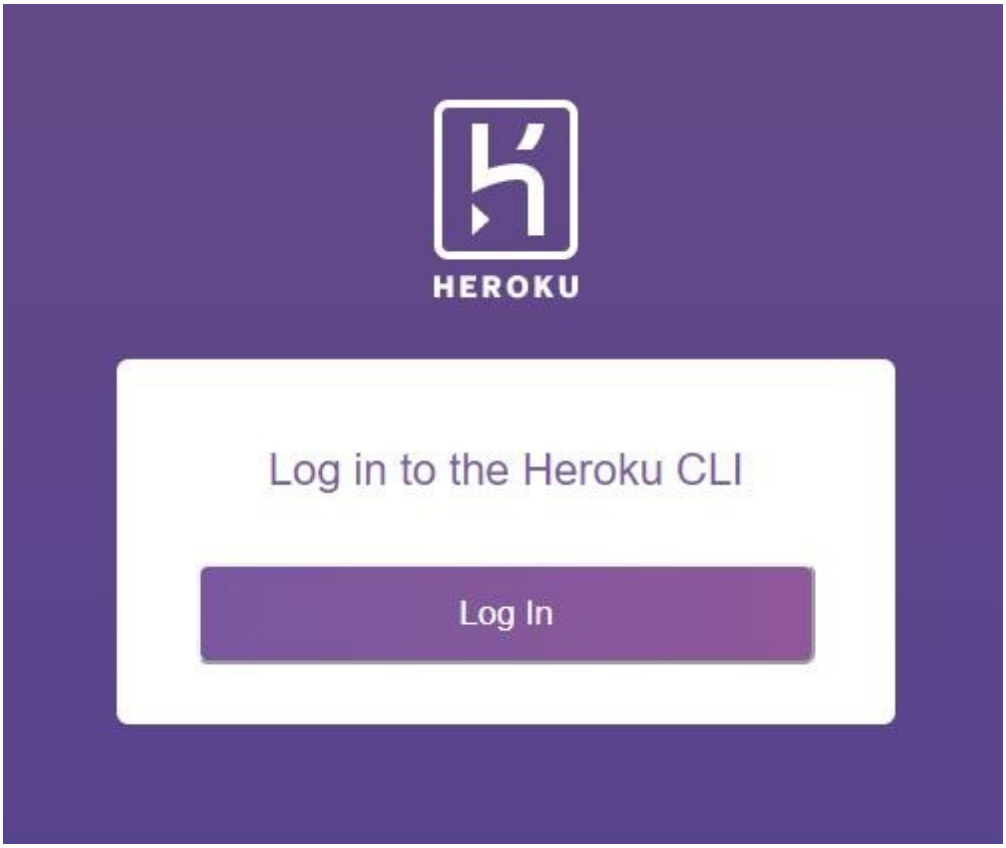


Step 2->Installing Heroku CLI (command line interface).



Step 3->Login to heroku by using **heroku login** command.

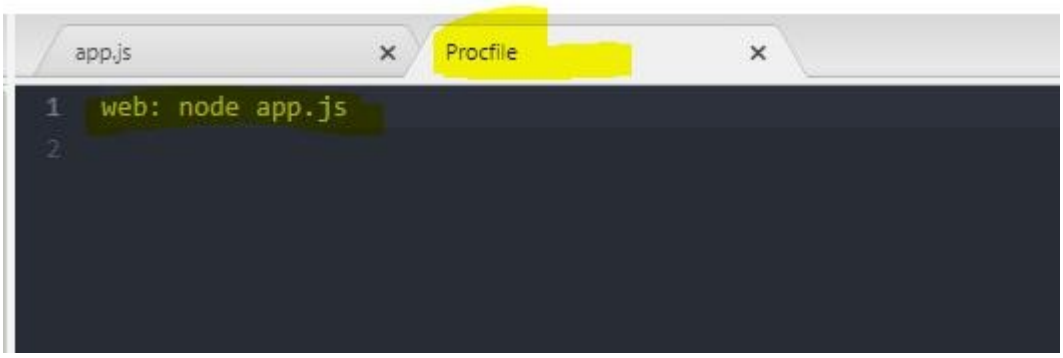
```
C:\Users\aman2>heroku login
 »   Warning: heroku update available from 7.35.1 to 7.40.0.
heroku: Press any key to open up the browser to login or q to exit:
```



Step 4->Creating an app on heroku which will prepare heroku to receive our source code.

```
C:\Users\aman2>heroku create
 »   Warning: heroku update available from 7.35.1 to 7.40.0.
Creating app... done, ⬚ peaceful-wildwood-41117
https://peaceful-wildwood-41117.herokuapp.com/ | https://git.heroku.com/peaceful-wildwood-41117.git
```

Step 5->Defining a **procfile** to explicitly declare what command heroku should use to start the app.



Step 6 -> Defining **port** on which app should listen/start

```
10  const PORT = process.env.PORT || 5000
```

```
88  app.listen(PORT, function() {
89    console.log(`Server started on port ${PORT} ` );
90  });
91
```

Step 7 -> Finding version of node and adding it **package.json** file

```
C:\Users\aman2>node --version
v12.14.0
```

app.js | package.json | Procfile

```
{
  "name": "ejs-challenge",
  "version": "1.0.0",
  "description": "",
  "main": "app.js",
  "scripts": {
    "test": "echo \"Error: no test specified\" && exit 1"
  },
  "engines": {
    "node": "12.14.0"
  },
  "author": "",
  "license": "ISC",
  "dependencies": {
    "body-parser": "^1.18.3",
    "ejs": "^2.6.1",
    "express": "^4.16.3",
    "lodash": "^4.17.11",
    "mongoose": "^5.9.12",
    "moongoose": "0.0.5",
    "serve-favicon": "^2.5.0"
  }
}
```

Step 7 ->Initialising **git repository** .

```
rcise\Blog-with-Database-Starting-Files>git init
Initialized empty Git repository in C:/Users/aman2/
```

Step 8 ->Adding **.gitignore** file to avoid uploading unnecessary files/folder.

app.js | package.json | .gitignore | Procfile

```
/node_modules
npm-debug.log
.DS_Store
/*.env
```

Step 9 ->Adding all files to **staging area** and **commiting** all changes.

```
C:\Users\aman2\Desktop\[redacted]Blog-with-Database-Starting-Files>git add
.
warning: LF will be replaced by CRLF in app.js.
The file will have its original line endings in your working directory
warning: LF will be replaced by CRLF in package-lock.json.
The file will have its original line endings in your working directory
warning: LF will be replaced by CRLF in package.json.
The file will have its original line endings in your working directory
warning: LF will be replaced by CRLF in public/css/styles.css.
The file will have its original line endings in your working directory
warning: LF will be replaced by CRLF in views/about.ejs.
The file will have its original line endings in your working directory
warning: LF will be replaced by CRLF in views/compose.ejs.
The file will have its original line endings in your working directory
warning: LF will be replaced by CRLF in views/contact.ejs.
The file will have its original line endings in your working directory
warning: LF will be replaced by CRLF in views/home.ejs.
The file will have its original line endings in your working directory
warning: LF will be replaced by CRLF in views/partials/footer.ejs.
The file will have its original line endings in your working directory
warning: LF will be replaced by CRLF in views/partials/header.ejs.
The file will have its original line endings in your working directory
warning: LF will be replaced by CRLF in views/post.ejs.
The file will have its original line endings in your working directory
```

```
rcise\Blog-with-Database-Starting-Files>git commit -am "commit all changes"
[master (root-commit) 187b135] commit all changes
 14 files changed, 1034 insertions(+)
 create mode 100644 .gitignore
 create mode 100644 Procfile
 create mode 100644 app.js
 create mode 100644 package-lock.json
 create mode 100644 package.json
 create mode 100644 public/css/styles.css
 create mode 100644 public/favicon.ico
 create mode 100644 views/about.ejs
 create mode 100644 views/compose.ejs
 create mode 100644 views/contact.ejs
 create mode 100644 views/home.ejs
 create mode 100644 views/partials/footer.ejs
 create mode 100644 views/partials/header.ejs
 create mode 100644 views/post.ejs
```

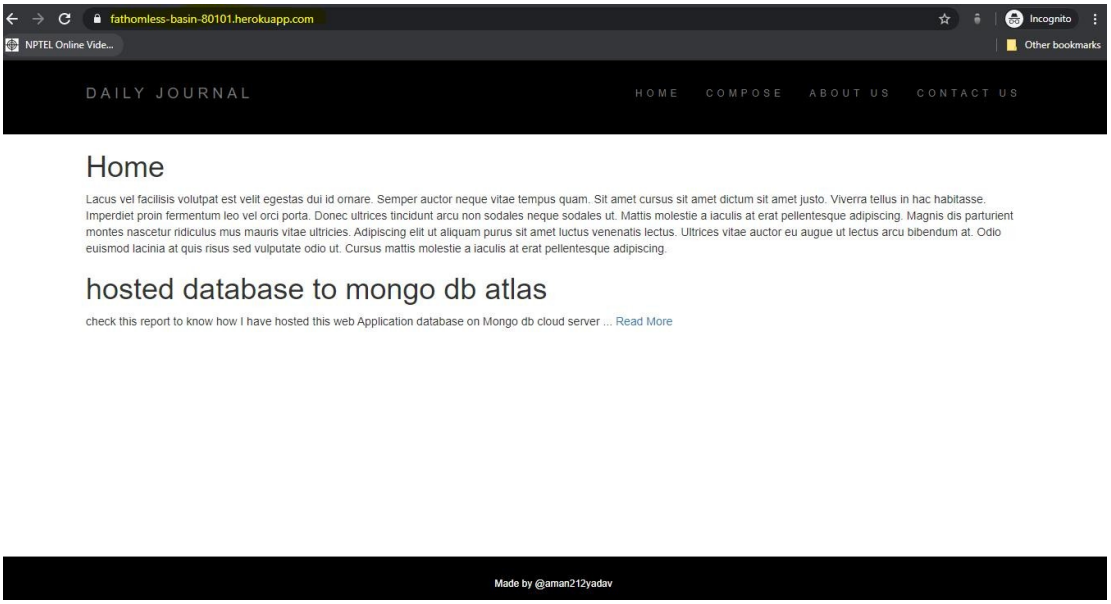
Step 10 ->Pushing all changes to remote repository heroku master.

```
rcise\Blog-with-Database-Starting-Files>git push heroku master
Enumerating objects: 20, done.
Counting objects: 100% (20/20), done.
Delta compression using up to 4 threads
Compressing objects: 100% (17/17), done.
Writing objects: 100% (20/20), 16.64 KiB | 3.33 MiB/s, done.
Total 20 (delta 0), reused 0 (delta 0)
remote: Compressing source files... done.
remote: Building source:
remote:
remote: -----> Node.js app detected
remote:
remote: -----> Creating runtime environment
remote:
remote:        NPM_CONFIG_LOGLEVEL=error
remote:        NODE_ENV=production
remote:        NODE_MODULES_CACHE=true
remote:        NODE_VERBOSE=false
remote:
remote: -----> Installing binaries
remote:        engines.node (package.json):  12.14.0
remote:        engines.npm (package.json):   unspecified (use default)
remote:
remote:        Resolving node version 12.14.0...
remote:        Downloading and installing node 12.14.0...
remote:        Using default npm version: 6.13.4
remote:
remote: -----> Installing dependencies
remote:        Installing node modules
```

Step 11 ->Application deployed successfully on cloud .

```
remote: -----> Caching build
remote:        - node_modules
remote:
remote: -----> Pruning devDependencies
remote:        audited 219 packages in 1.178s
remote:
remote:        1 package is looking for funding
remote:          run `npm fund` for details
remote:
remote:        found 2 high severity vulnerabilities
remote:          run `npm audit fix` to fix them, or `npm audit` for details
remote:
remote: -----> Build succeeded!
remote: -----> Discovering process types
remote:        Procfile declares types -> web
remote:
remote: -----> Compressing...
remote:        Done: 25.4M
remote: -----> Launching...
remote:        Released v3
remote:        https://fathomless-basin-80101.herokuapp.com/ deployed to Heroku
remote:
remote: Verifying deploy... done.
To https://git.heroku.com/fathomless-basin-80101.git
 * [new branch]      master -> master
```

Got a publically accessible URL.



Conclusion -> both database and web application hosted successfully on the cloud web services (ATLAS, Heroku).

URL-> https://fathomless-basin-80101.herokuapp.com/