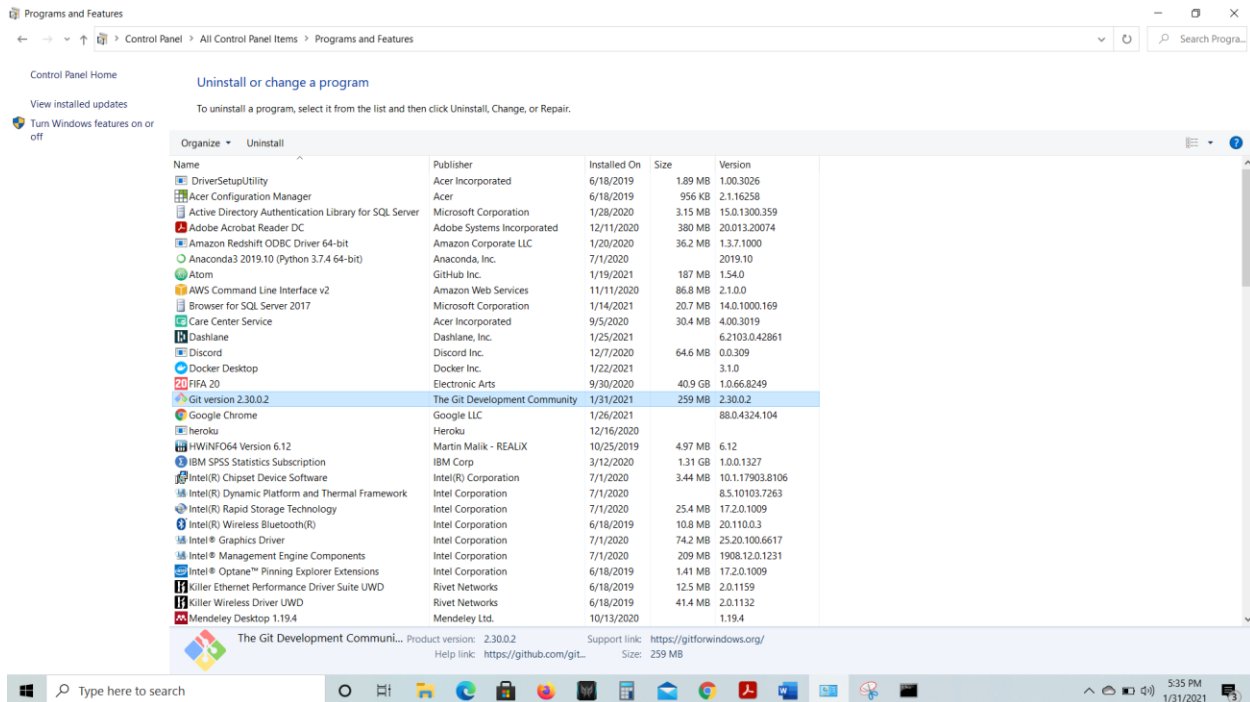# AIDI-2004: Artificial Intelligence in Enterprise Systems
Lab #1 – Git, GitHub, GitLab

Step1: Installation of Git:
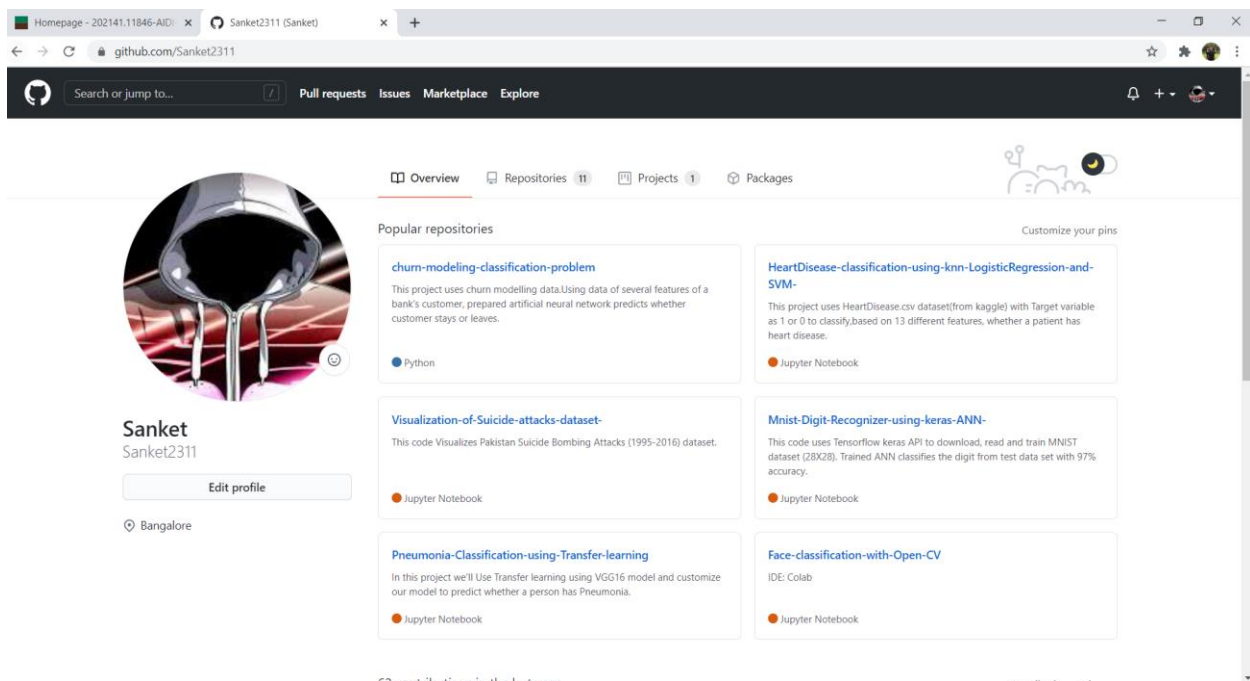
a. **I have git installed on my system already**
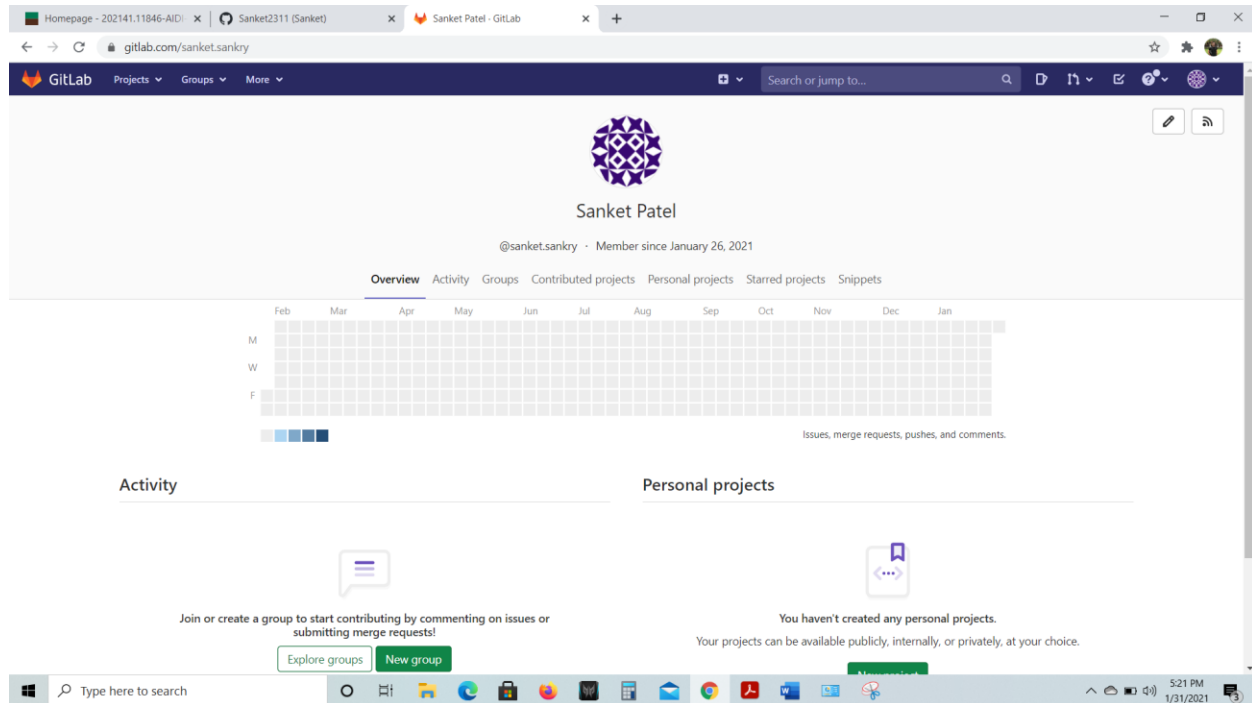b. **Below are the screenshots**

Step2: Create user accounts in both github and gitlab.

      a.   I already have account on github

      b.   Creating account on gitlab

Step3: Review github and gitlab. Select your remote host (github or gitlab or any new one) and justify your selection.

I am selecting github as my remote repository.

GitHub positioned itself among its community of developers. And its popularity is mainly driven by the highly active GitHub community of millions of developers. We can discuss problems and maybe learn a few unofficial but awesome hacks.

If you're looking for the biggest community of developers, chances are high that GitHub is the better place to be.

Some benefits of github over gitlab include,
    Developers are allowed to promote inner sourcing of internal repositories for Github. GitLab doesn't allow inner sourcing.
    Confidential issues module creates confidential issues that are visible only to project members. GitLab lacks this the confidential issue feature.

I have some basic experience with github and in large number of corporations it is still used.

Moreover, it is more intuitive for a relative beginner as me.

So, I am choosing github.

Step4: Write a basic program performing key programming activities

Adding remote repository

Adding name and email to git.

Creating basic matrix multiplication python file.
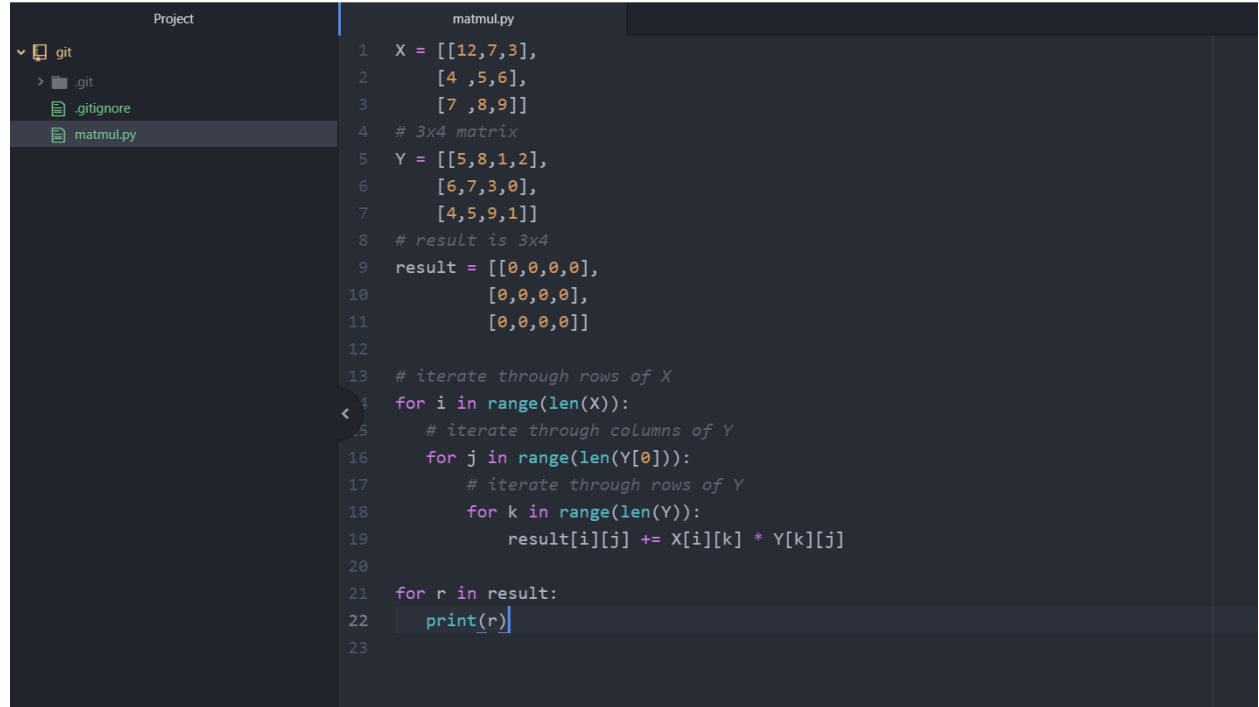
```
sanke@LAPTOP-FCU1PJ2S MINGW64 /e/AIDI/Sem 2/AIDI 2004/Lab1/git (master)
$ touch matmul.py
```

Basic python code performing matrix multiplication.

matmul.py — E:\AIDI\Sem 2\AIDI 2004\Lab1\git — Atom

File Edit View Selection Find Packages Help

Project

matmul.py

```python
1   X = [[12,7,3],
2        [4 ,5,6],
3        [7 ,8,9]]
4   # 3x4 matrix
5   Y = [[5,8,1,2],
6        [6,7,3,0],
7        [4,5,9,1]]
8   # result is 3x4
9   result = [[0,0,0,0],
10            [0,0,0,0],
11            [0,0,0,0]]
12
13  # iterate through rows of X
14  for i in range(len(X)):
15      # iterate through columns of Y
16      for j in range(len(Y[0])):
17          # iterate through rows of Y
18          for k in range(len(Y)):
19              result[i][j] += X[i][k] * Y[k][j]
20
21  for r in result:
22      print(r)
23
```

Step5: Provide screenshot of your command prompt showing success of your commit in the remote host.

```
sanke@LAPTOP-FCU1PJ2S MINGW64 /e/AIDI/Sem 2/AIDI 2004/Lab1/git (master)
$ git status
On branch master
Changes to be committed:
  (use "git restore --staged <file>..." to unstage)
        new file:   .gitignore
        deleted:    app.js
        deleted:    index.html

Untracked files:
  (use "git add <file>..." to include in what will be committed)
        matmul.py


sanke@LAPTOP-FCU1PJ2S MINGW64 /e/AIDI/Sem 2/AIDI 2004/Lab1/git (master)
$
```

Adding it to staging area.


```
sanke@LAPTOP-FCU1PJ2S MINGW64 /e/AIDI/Sem 2/AIDI 2004/Lab1/git (master)
$ git add .

sanke@LAPTOP-FCU1PJ2S MINGW64 /e/AIDI/Sem 2/AIDI 2004/Lab1/git (master)
$ git status
On branch master
Changes to be committed:
  (use "git restore --staged <file>..." to unstage)
        new file:   .gitignore
        deleted:    app.js
        deleted:    index.html
        new file:   matmul.py


sanke@LAPTOP-FCU1PJ2S MINGW64 /e/AIDI/Sem 2/AIDI 2004/Lab1/git (master)
$
```

Added.

Now, let's make an initial commit


```
sanke@LAPTOP-FCU1PJ2S MINGW64 /e/AIDI/Sem 2/AIDI 2004/Lab1/git (master)
$ git commit -m "first commit"
[master (root-commit) 41c7dfd] first commit
 1 file changed, 22 insertions(+)
 create mode 100644 matmul.py

sanke@LAPTOP-FCU1PJ2S MINGW64 /e/AIDI/Sem 2/AIDI 2004/Lab1/git (master)
$
```

Try committing without any changes

```
sanke@LAPTOP-FCU1PJ2S MINGW64 /e/AIDI/Sem 2/AIDI 2004/Lab1/git (master)
$ git commit -m "first commit"
On branch master
nothing to commit, working tree clean
```

Setting up the main branch

```
sanke@LAPTOP-FCU1PJ2S MINGW64 /e/AIDI/Sem 2/AIDI 2004/Lab1/git (master)
$ git branch -M main
```

Pushing the initial changes.


```
sanke@LAPTOP-FCU1PJ2S MINGW64 /e/AIDI/Sem 2/AIDI 2004/Lab1/git (main)
$ git push -u origin main
Enumerating objects: 3, done.
Counting objects: 100% (3/3), done.
Delta compression using up to 8 threads
Compressing objects: 100% (2/2), done.
Writing objects: 100% (3/3), 432 bytes | 216.00 KiB/s, done.
Total 3 (delta 0), reused 0 (delta 0), pack-reused 0
To https://github.com/Sanket2311/gitbasics.git
 * [new branch]      main -> main
Branch 'main' set up to track remote branch 'main' from 'origin'.

sanke@LAPTOP-FCU1PJ2S MINGW64 /e/AIDI/Sem 2/AIDI 2004/Lab1/git (main)
$
```
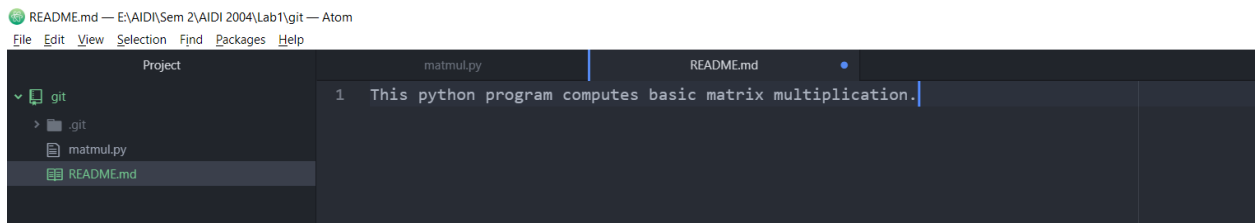
Before
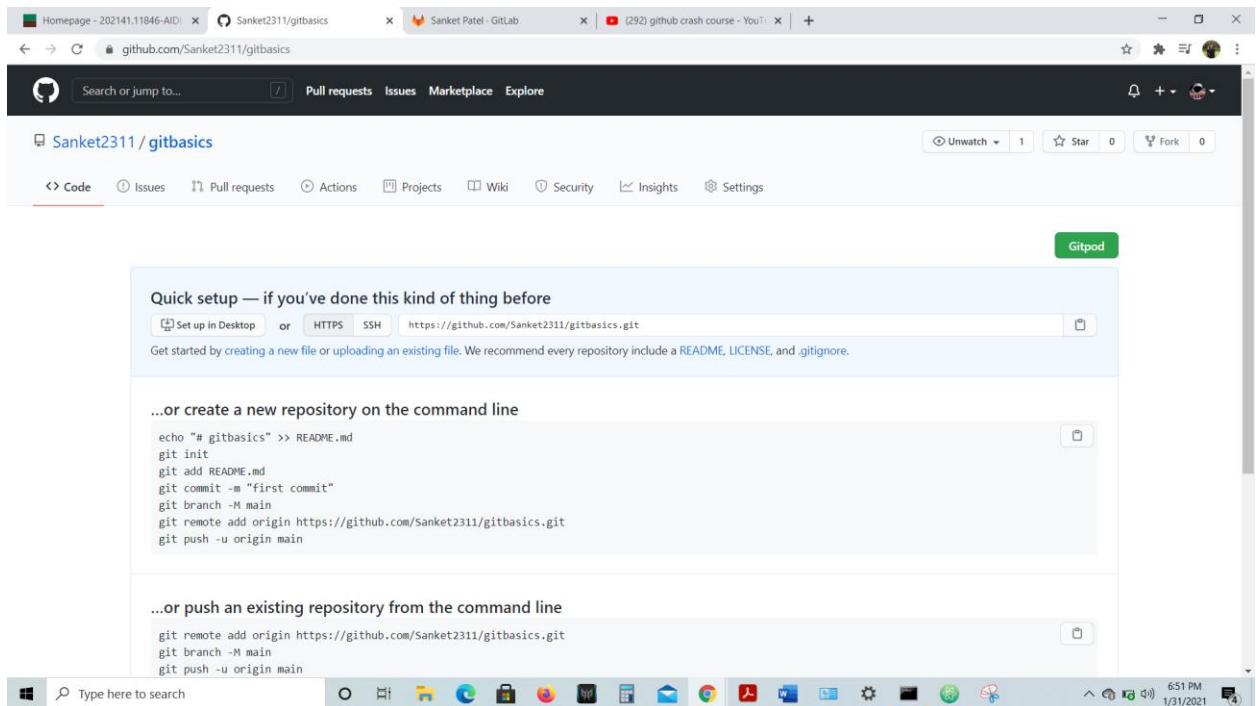
After
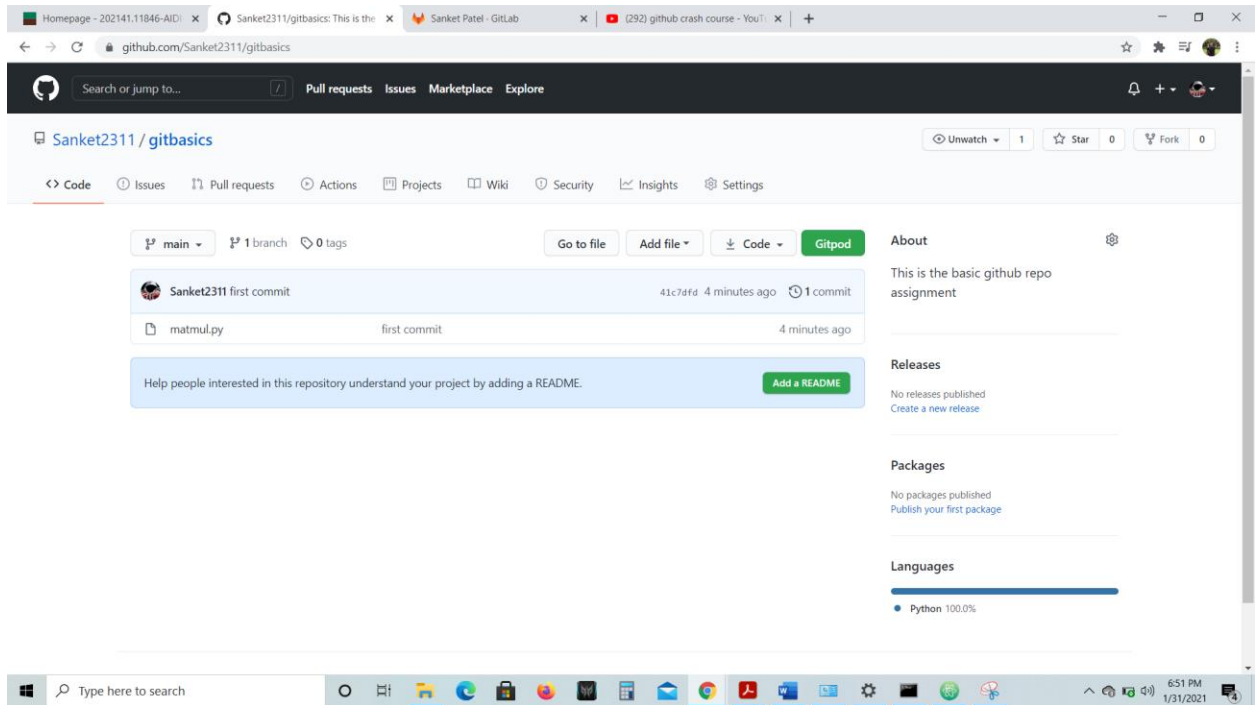
Step6: Provide a description of your program in the readme.md file

Adding description.

Checking status of README.md

```
sanke@LAPTOP-FCU1PJ2S MINGW64 /e/AIDI/Sem 2/AIDI 2004/Lab1/git (main)
$ git status
On branch main
Your branch is up to date with 'origin/main'.

Untracked files:
  (use "git add <file>..." to include in what will be committed)
        README.md

nothing added to commit but untracked files present (use "git add" to track)

sanke@LAPTOP-FCU1PJ2S MINGW64 /e/AIDI/Sem 2/AIDI 2004/Lab1/git (main)
$
```

adding to staging area

```
sanke@LAPTOP-FCU1PJ2S MINGW64 /e/AIDI/Sem 2/AIDI 2004/Lab1/git (main)
$ git add .

sanke@LAPTOP-FCU1PJ2S MINGW64 /e/AIDI/Sem 2/AIDI 2004/Lab1/git (main)
$ git status
On branch main
Your branch is up to date with 'origin/main'.

Changes to be committed:
  (use "git restore --staged <file>..." to unstage)
        new file:   README.md

sanke@LAPTOP-FCU1PJ2S MINGW64 /e/AIDI/Sem 2/AIDI 2004/Lab1/git (main)
$
```
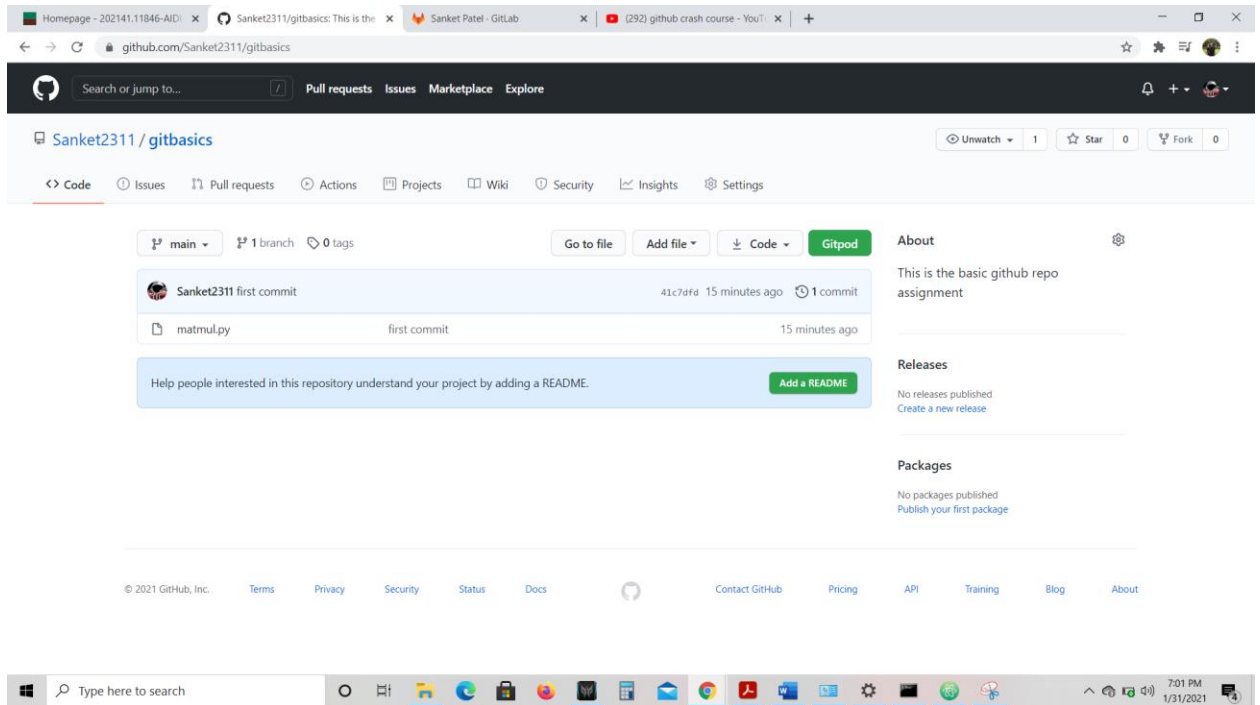
Let's commit readme file

```
sanke@LAPTOP-FCU1PJ2S MINGW64 /e/AIDI/Sem 2/AIDI 2004/Lab1/git (main)
$ git commit -m "Added ReadMe file"
[main 10e26df] Added ReadMe file
 1 file changed, 0 insertions(+), 0 deletions(-)
 create mode 100644 README.md

sanke@LAPTOP-FCU1PJ2S MINGW64 /e/AIDI/Sem 2/AIDI 2004/Lab1/git (main)
$
```

We still need to push changes

Let's push read me changes

I forgot to save changes initially. So, the committed file doesn't have any description inside the file. The uploaded README.md file was empty.
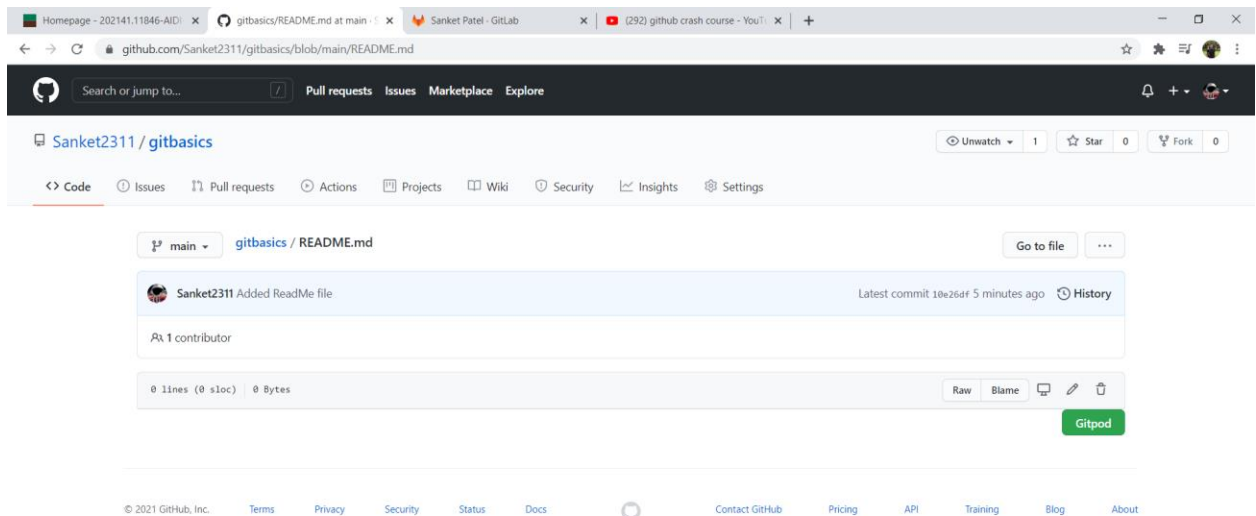
So, I decided to save the description and push the changes again to the remote repo.

Let's save and commit again.

After saving and checking status

Before

After

We can also see that description is being shown in main repo.

Step7: **Create a branch in your repo and upload any python script in that branch**

Creating and switching to a new branch named: random_matrix

MINGW64:/e/AIDI/Sem 2/AIDI 2004/Lab1/git   —

```
sanke@LAPTOP-FCU1PJ2S MINGW64 /e/AIDI/Sem 2/AIDI 2004/Lab1/git (main)
$ git branch random_matrix

sanke@LAPTOP-FCU1PJ2S MINGW64 /e/AIDI/Sem 2/AIDI 2004/Lab1/git (main)
$ git checkout random_matrix
Switched to branch 'random_matrix'

sanke@LAPTOP-FCU1PJ2S MINGW64 /e/AIDI/Sem 2/AIDI 2004/Lab1/git (random_matrix)
$
```

Creating the additional python file

```
sanke@LAPTOP-FCU1PJ2S MINGW64 /e/AIDI/Sem 2/AIDI 2004/Lab1/git (random_matrix)
$ touch matrix_generator.py
```

Another python file to generate a random 3X3 matrix:

matrix_generator.py — E:\AIDI\Sem 2\AIDI 2004\Lab1\git — Atom
File Edit View Selection Find Packages Help

```
Project          matmul.py          README.md          matrix_generator.py

git              1    #This program generates a random 3X3 matrix
  .git           2    import numpy as np
  matmul.py      3
  matrix_generator.py    4    def matrix_gen():
  README.md      5        mat= np.random.randint(9,size=(3,3))
                 6        return mat
                 7
                 8    print(matrix_gen())
                 9    |
```

Step8: Navigate to your newly created branch and provide screenshot showing status of your repo

```
sanke@LAPTOP-FCU1PJ2S MINGW64 /e/AIDI/Sem 2/AIDI 2004/Lab1/git (random_matrix)
$ git status
On branch random_matrix
Untracked files:
  (use "git add <file>..." to include in what will be committed)
        matrix_generator.py

nothing added to commit but untracked files present (use "git add" to track)

sanke@LAPTOP-FCU1PJ2S MINGW64 /e/AIDI/Sem 2/AIDI 2004/Lab1/git (random_matrix)
$
```
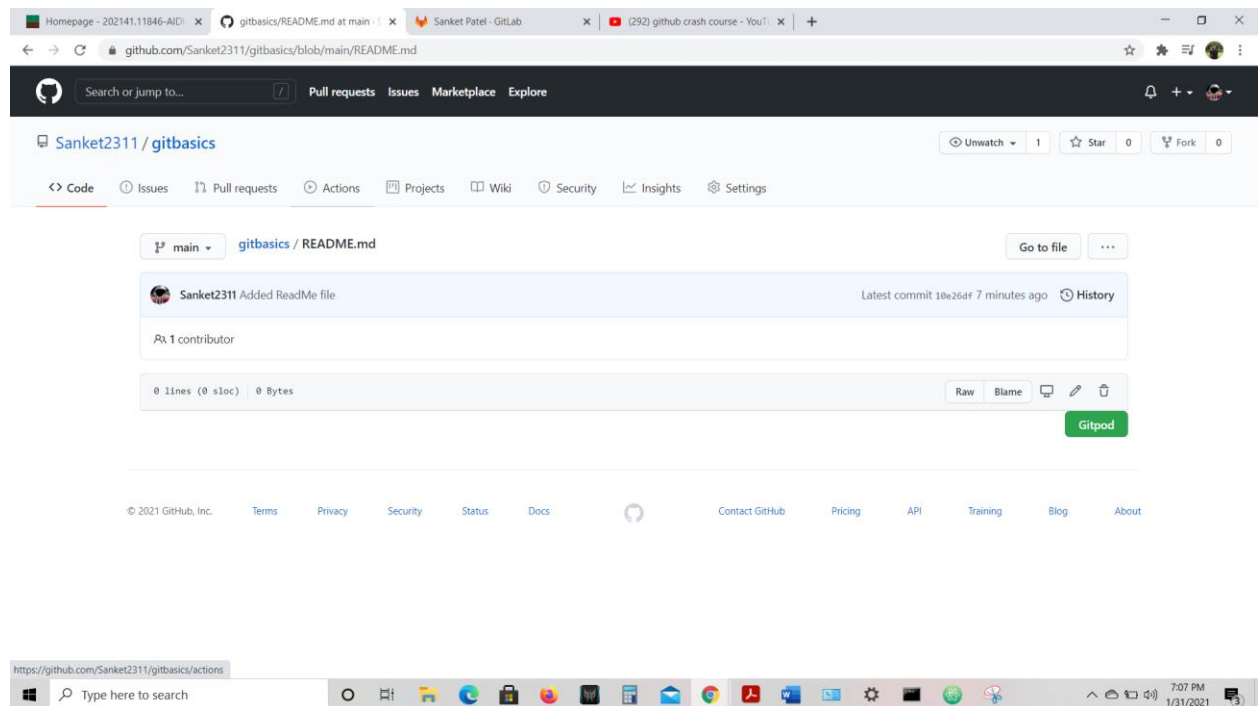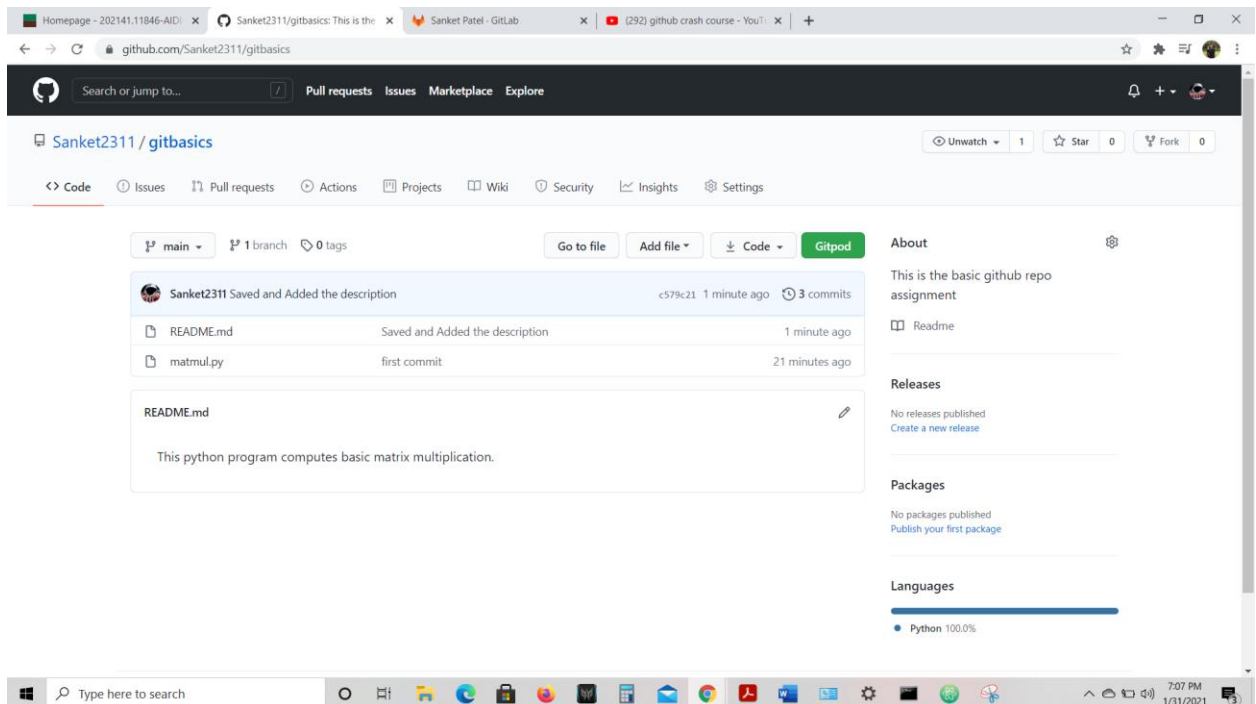
```
MINGW64:/e/AIDI/Sem 2/AIDI 2004/Lab1/git                              —    □

sanke@LAPTOP-FCU1PJ2S MINGW64 /e/AIDI/Sem 2/AIDI 2004/Lab1/git (random_matrix)
$ git add .

sanke@LAPTOP-FCU1PJ2S MINGW64 /e/AIDI/Sem 2/AIDI 2004/Lab1/git (random_matrix)
$ git commit -m "Added Random matrix generator"
[random_matrix e37f7e4] Added Random matrix generator
 1 file changed, 8 insertions(+)
 create mode 100644 matrix_generator.py

sanke@LAPTOP-FCU1PJ2S MINGW64 /e/AIDI/Sem 2/AIDI 2004/Lab1/git (random_matrix)
$ git status
On branch random_matrix
nothing to commit, working tree clean

sanke@LAPTOP-FCU1PJ2S MINGW64 /e/AIDI/Sem 2/AIDI 2004/Lab1/git (random_matrix)
$
```

Let's go back to main branch

```
sanke@LAPTOP-FCU1PJ2S MINGW64 /e/AIDI/Sem 2/AIDI 2004/Lab1/git (random_matrix)
$ git checkout main
Switched to branch 'main'
Your branch is up to date with 'origin/main'.

sanke@LAPTOP-FCU1PJ2S MINGW64 /e/AIDI/Sem 2/AIDI 2004/Lab1/git (main)
$ git status
On branch main
Your branch is up to date with 'origin/main'.

nothing to commit, working tree clean
```

Let's merge both branches(main and random_matrix)

```
sanke@LAPTOP-FCU1PJ2S MINGW64 /e/AIDI/Sem 2/AIDI 2004/Lab1/git (Main)
$ git merge random_matrix -m "Added random matrix generator"
Updating c579c21..e37f7e4
Fast-forward (no commit created; -m option ignored)
 matrix_generator.py | 8 ++++++++
 1 file changed, 8 insertions(+)
 create mode 100644 matrix_generator.py
```

```
$ git merge random_matrix -m "Added matrix generator"
Already up to date.
```

Both branches are merged

Now let's check status and push changes

Step9: Provide a screenshot showing your log of activities and perform your final commit

```
sanke@LAPTOP-FCU1PJ2S MINGW64 /e/AIDI/Sem 2/AIDI 2004/Lab1/git (main)
$ git push
Enumerating objects: 4, done.
Counting objects: 100% (4/4), done.
Delta compression using up to 8 threads
Compressing objects: 100% (3/3), done.
Writing objects: 100% (3/3), 450 bytes | 450.00 KiB/s, done.
Total 3 (delta 0), reused 0 (delta 0), pack-reused 0
To https://github.com/Sanket2311/gitbasics.git
   c579c21..e37f7e4  main -> main

sanke@LAPTOP-FCU1PJ2S MINGW64 /e/AIDI/Sem 2/AIDI 2004/Lab1/git (main)
$
```
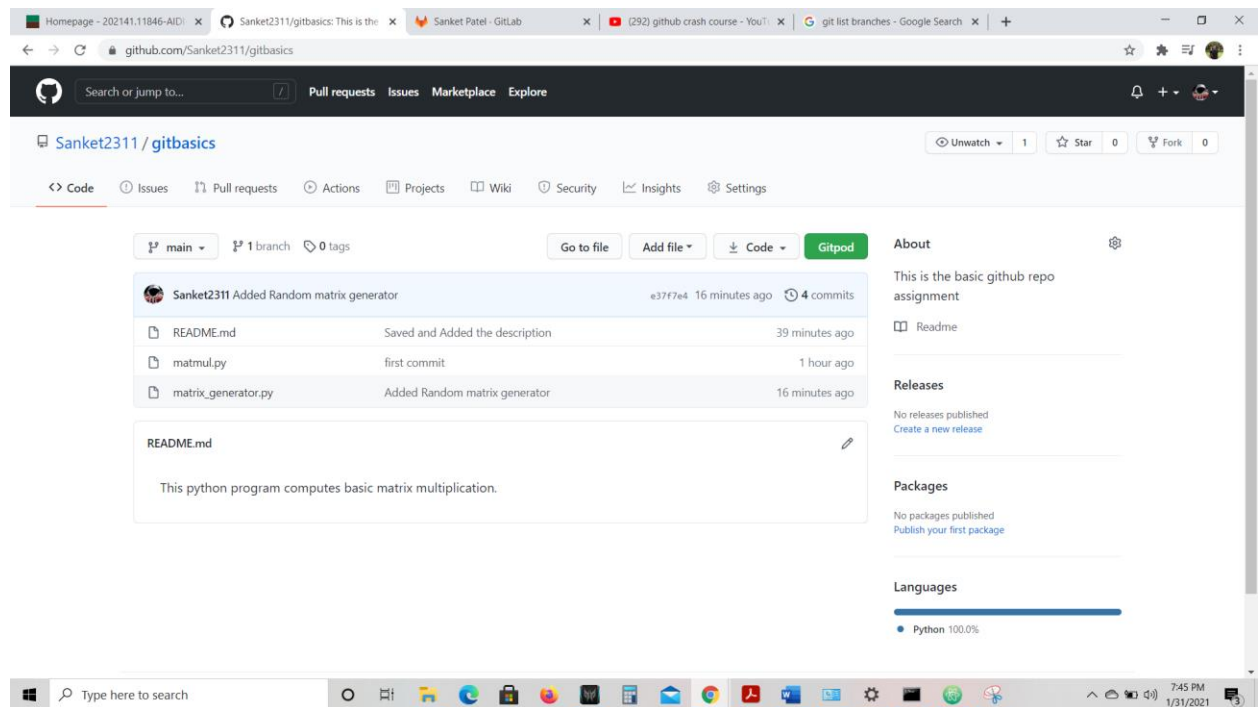
Before

After

Extra:

Now, Let's upload whole branch to remote repo.

```
sanke@LAPTOP-FCU1PJ2S MINGW64 /e/AIDI/Sem 2/AIDI 2004/Lab1/git (main)
$ git checkout random_matrix
Switched to branch 'random_matrix'

sanke@LAPTOP-FCU1PJ2S MINGW64 /e/AIDI/Sem 2/AIDI 2004/Lab1/git (random_matrix)
$ git push
fatal: The current branch random_matrix has no upstream branch.
To push the current branch and set the remote as upstream, use

    git push --set-upstream origin random_matrix


sanke@LAPTOP-FCU1PJ2S MINGW64 /e/AIDI/Sem 2/AIDI 2004/Lab1/git (random_matrix)
$ git push --set-upstream origin random_matrix
Total 0 (delta 0), reused 0 (delta 0), pack-reused 0
remote:
remote: Create a pull request for 'random_matrix' on GitHub by visiting:
remote:      https://github.com/Sanket2311/gitbasics/pull/new/random_matrix
remote:
To https://github.com/Sanket2311/gitbasics.git
 * [new branch]      random_matrix -> random_matrix
Branch 'random_matrix' set up to track remote branch 'random_matrix' from 'origin'.

sanke@LAPTOP-FCU1PJ2S MINGW64 /e/AIDI/Sem 2/AIDI 2004/Lab1/git (random_matrix)
$
```

Before

After

Note: Remote branch random_matrix was pushed to remote repo after it was merged with main in local system. Hence, it contains other files than only a python file(matrix_generator). But, branching and pushing concepts are clear.

Log screenshot:

MINGW64:/e/AIDI/Sem 2/AIDI 2004/Lab1/git

```
sanke@LAPTOP-FCU1PJ2S MINGW64 /e/AIDI/Sem 2/AIDI 2004/Lab1/git (random_matrix)
$ git log --all
commit e37f7e41fe44aefcfca837fb72a2fa46a9391764 (HEAD -> random_matrix, origin/random_matrix, origin/Main, Main)
Author: Sanket Patel <sanket.sankry@gmail.com>
Date:   Sun Jan 31 19:29:23 2021 -0500

    Added Random matrix generator

commit c579c21c8d8d8aecad41e69bad4db5dbe0eb7eef
Author: Sanket Patel <sanket.sankry@gmail.com>
Date:   Sun Jan 31 19:06:54 2021 -0500

    Saved and Added the description

commit 10e26dfa82fe5f54bee5b693e1db3797e653a965
Author: Sanket Patel <sanket.sankry@gmail.com>
Date:   Sun Jan 31 19:00:55 2021 -0500

    Added ReadMe file

commit 41c7dfd1c8994cbcf64b218041d4d6e7c98e4bfe
Author: Sanket Patel <sanket.sankry@gmail.com>
Date:   Sun Jan 31 18:47:20 2021 -0500

    first commit

sanke@LAPTOP-FCU1PJ2S MINGW64 /e/AIDI/Sem 2/AIDI 2004/Lab1/git (random_matrix)
$
```

Step10: Make your repo public and share the link of your repo for check.

Link: https://github.com/Sanket2311/gitbasics