THE HONG KONG POLYTECHNIC UNIVERSITY
香港理工大學

Information Technology Services Office

Use Case for GitLab

Using GitLab for R Program Development and Execution on Pilot HPC Platform

Version: 2.0

USER GUIDE

Table of Contents

Introduction

You could use GitLab Service for Research to manage your program code development supporting Git version control.

In this document, there is an example on how to integrate with your Git repository (your R program) to developing or coding in your RStudio of your machine and run it in Pilot HPC Platform.

Details about the Pilot HPC Platform and GitLab Service for Research, please refer to the ITS Support for Research Website.

Purpose

This User Guide contains all essential information and step-by-step procedures for the user (PolyU’s researcher) to develop R program in RStudio, manage or store the code in GitLab Service for Research and run the R program in Pilot HPC Platform. All the code in your machine and Pilot HPC Platform have been aligned through the GitLab Service for Research.

Part I: Get started with GitLab

1. You should first register for the GitLab Service, prepare a Git installation on your machine and do the Git global setup to get started.

2. Please follow the steps in the "GitLab Service for Research User Guide" from ***Part I to Part II.***

Part II: File (Repository) Synchronization among GitLab service, RStudio and Pilot HPC Platform

After completing the basic setup, below is the instruction on how to use the example to demonstrate the files (.R file and .pbs file) synchronization among GitLab Service for Research (Git), RStudio and Pilot HPC Platform (HPC).

A) Install Anaconda 3 and RStudio in Anaconda 3

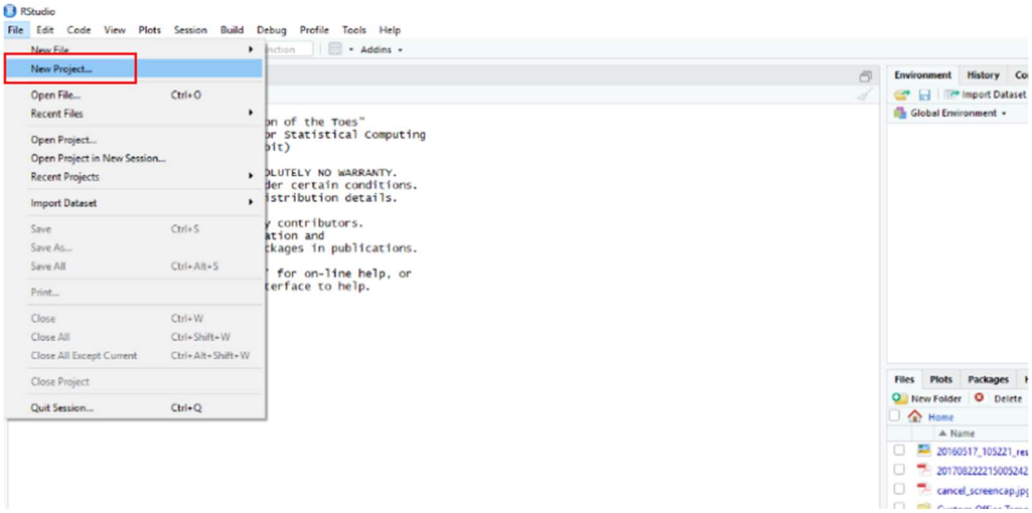
1. You should install the Anaconda 3 and RStudio in Anaconda 3 first.
2. Please follow the steps in the "GitLab Service for Research User Guide" from ***Appendix A & B.***

B) R script (.R file) and PBS script (.pbs file)

Second, you will need a R script (.R file) and set up a Portable Batch System (PBS) script (.pbs file) for submitting job in HPC.

From the following, we will be downloading the files of "sample.R" and "R.pbs" from the sharing Git repository from ITS, it is named as "use-case-R-sample":

1. Download the sample files from the sharing Git repository from ITS.
2. Click File -> New Project.



```
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' for on-line help, or
terface to help.
```
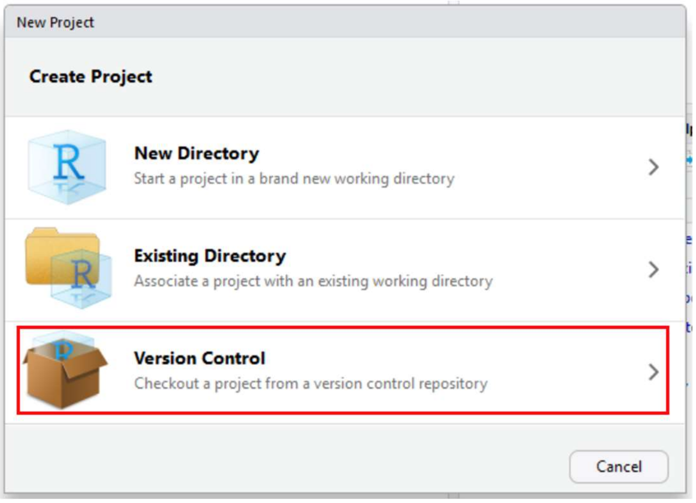
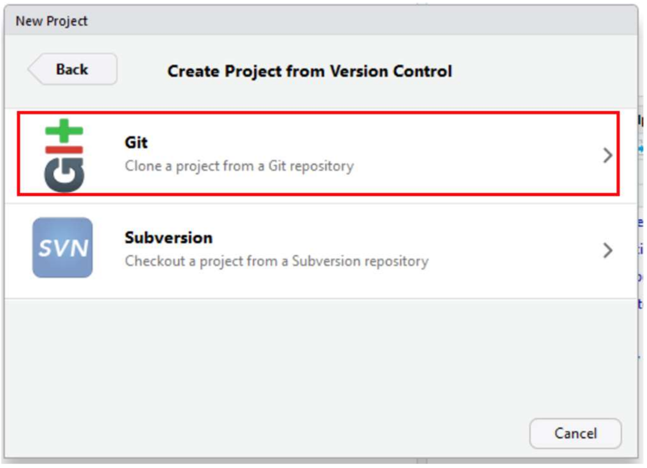
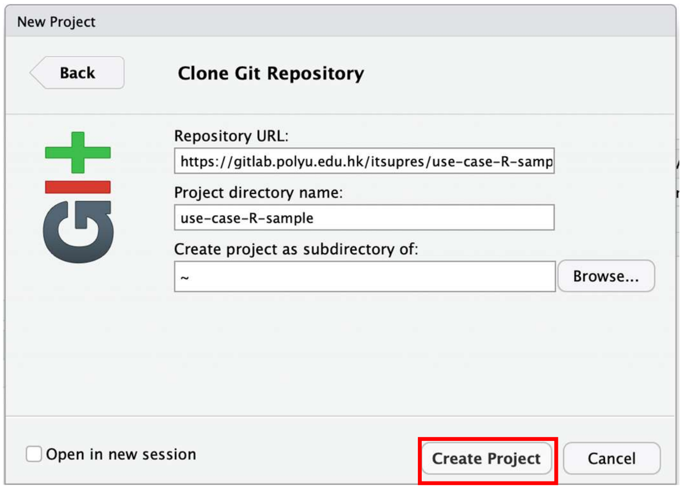

3. Select "Version Control".


New Project
Create Project
New Directory
Start a project in a brand new working directory
Existing Directory
Associate a project with an existing working directory
Version Control
Checkout a project from a version control repository
Cancel

4. Select “Git”.


New Project
Back
Create Project from Version Control
Git
Clone a project from a Git repository
SVN
Subversion
Checkout a project from a Subversion repository
Cancel

5. Copy and paste below Git URL in “Repository URL”: ***https://gitlab.polyu.edu.hk/itsupres/use-case-R-sample.git***
6. Enter the project repository name.
7. Click “Create Project”.

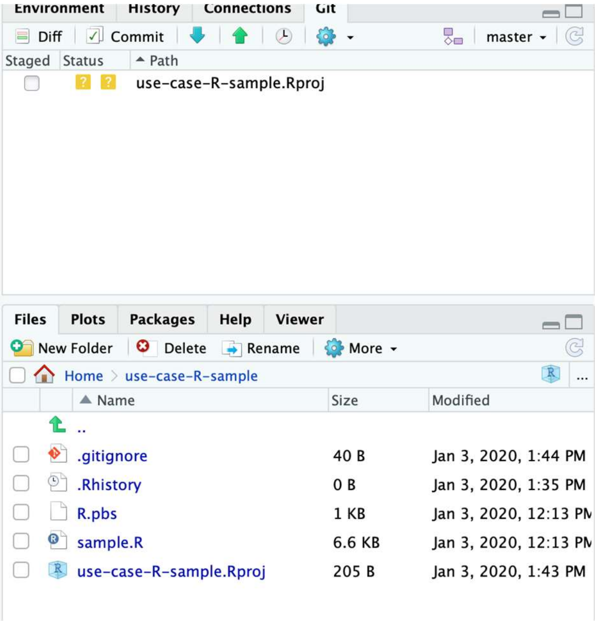


Repository URL:
https://gitlab.polyu.edu.hk/itsupres/use-case-R-samp

Project directory name:
use-case-R-sample

Create project as subdirectory of:
~

8. The Git repository will be cloned in RStudio.



Staged	Status	Path
□	? ?	use-case-R-sample.Rproj

	Name	Size	Modified
	..		
□	.gitignore	40 B	Jan 3, 2020, 1:44 PM
□	.Rhistory	0 B	Jan 3, 2020, 1:35 PM
□	R.pbs	1 KB	Jan 3, 2020, 12:13 PM
□	sample.R	6.6 KB	Jan 3, 2020, 12:13 PM
□	use-case-R-sample.Rproj	205 B	Jan 3, 2020, 1:43 PM

C) Push the sharing Git repository to the new created Git repository

1. You should create a new repository in your Git, please refer the steps from ***Part III*** in the “GitLab Service for Research User Guide”.

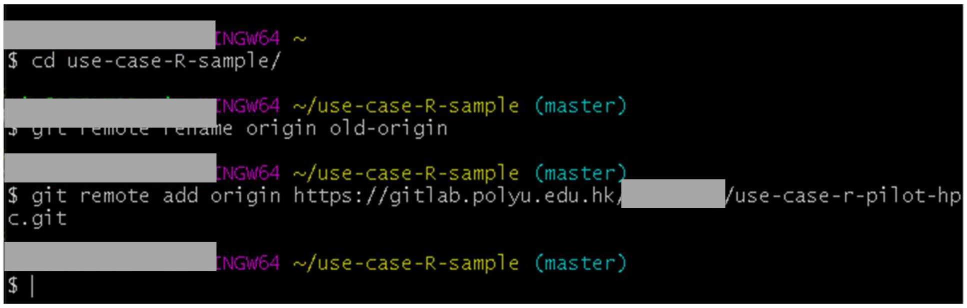
2. It this example, the new created Git repository is “use-case-R-pilot-hpc”.

3. Push the Git repository from Part B to the new created repository by using below command.
4. Change the location in your command-line client.

```
$ cd use-case-R-sample
```

5. Use the git remote command and add a connection to your new created repository.

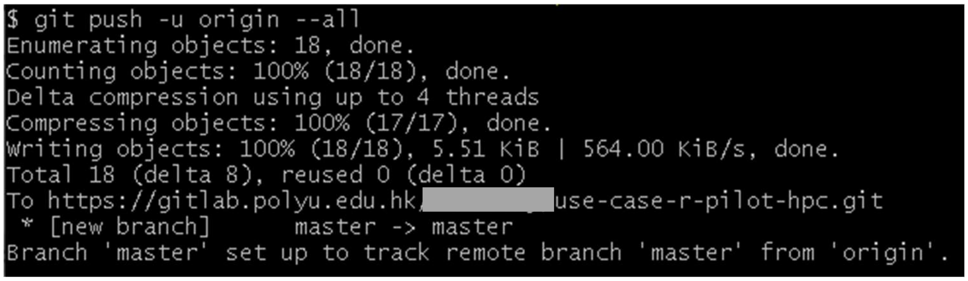
```
$ git remote rename origin old-origin
$ git remote add origin https://gitlab.polyu.edu.hk/NetID/use-case-R-pilot-hpc.git
```



```
[redacted]INGW64 ~
$ cd use-case-R-sample/

[redacted]INGW64 ~/use-case-R-sample (master)
me origin old-origin

[redacted]INGW64 ~/use-case-R-sample (master)
$ git remote add origin https://gitlab.polyu.edu.hk/[redacted]/use-case-r-pilot-hp
c.git

[redacted]INGW64 ~/use-case-R-sample (master)
$ |
```

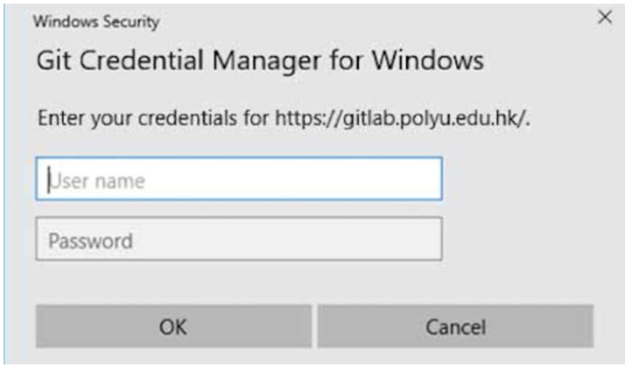
6. Git push.

```
$ git push -u origin --all
```



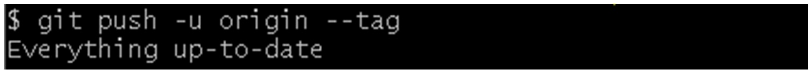
```
$ git push -u origin --all
Enumerating objects: 18, done.
Counting objects: 100% (18/18), done.
Delta compression using up to 4 threads
Compressing objects: 100% (17/17), done.
Writing objects: 100% (18/18), 5.51 KiB | 564.00 KiB/s, done.
Total 18 (delta 8), reused 0 (delta 0)
To https://gitlab.polyu.edu.hk/[redacted]use-case-r-pilot-hpc.git
 * [new branch]      master -> master
Branch 'master' set up to track remote branch 'master' from 'origin'.
```

Enter the credentials. (Window user only when user are 1st time login.)



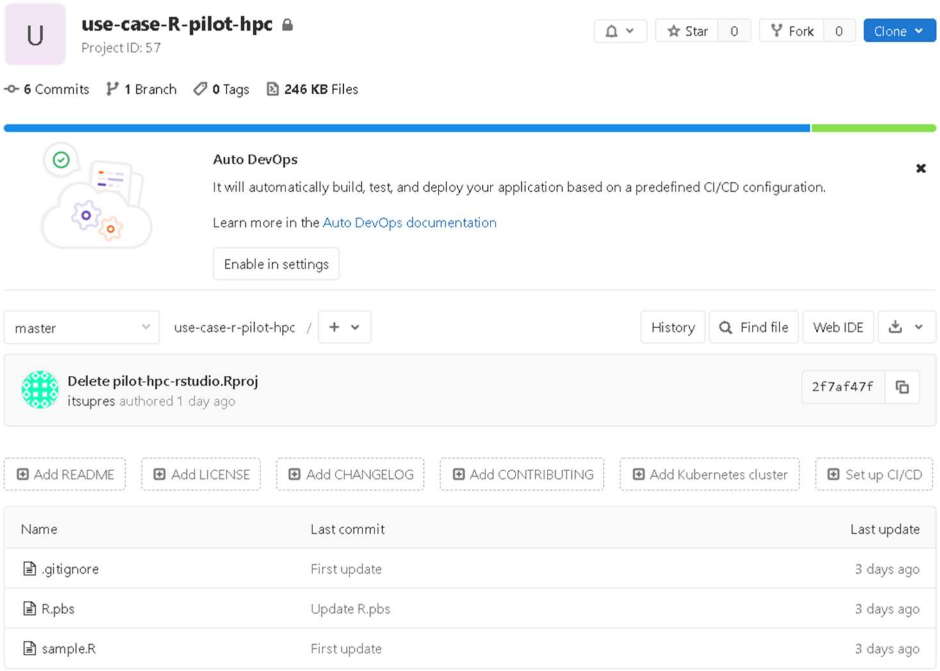
Enter your credentials for https://gitlab.polyu.edu.hk/.

```
$ git push -u origin --tag
```



```
$ git push -u origin --tag
Everything up-to-date
```

7. Reload the page in Git and check if those files have been uploaded in your new created repository.



Auto DevOps

It will automatically build, test, and deploy your application based on a predefined CI/CD configuration.

Learn more in the Auto DevOps documentation

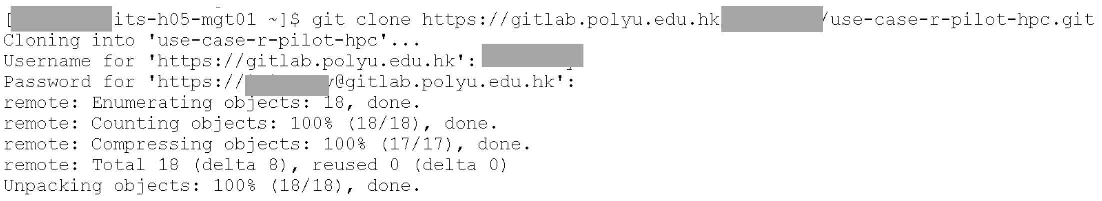
Delete pilot-hpc-rstudio.Rproj
itsupres authored 1 day ago

Name	Last commit	Last update
.gitignore	First update	3 days ago
R.pbs	Update R.pbs	3 days ago
sample.R	First update	3 days ago

D) Connect Pilot HPC Platform with Git

1. Please make sure you are the Pilot HPC Platform registered user, details please refer to IT Support for Research Website.
2. Login to Pilot HPC Platform. (Mac user please use terminal.)

```
$ ssh h05.its.polyu.edu.hk

$ git clone https://gitlab.polyu.edu.hk/NetID/use-case-r-pilot-hpc.git
```

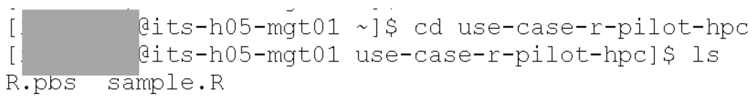


```
[[redacted]its-h05-mgt01 ~]$ git clone https://gitlab.polyu.edu.hk[redacted]/use-case-r-pilot-hpc.git
Cloning into 'use-case-r-pilot-hpc'...
Username for 'https://gitlab.polyu.edu.hk': [redacted]
Password for 'https://[redacted]@gitlab.polyu.edu.hk':
remote: Enumerating objects: 18, done.
remote: Counting objects: 100% (18/18), done.
remote: Compressing objects: 100% (17/17), done.
remote: Total 18 (delta 8), reused 0 (delta 0)
Unpacking objects: 100% (18/18), done.
```

E) Submit job in Pilot HPC Platform and synchronize the result to Git

1. Check the downloaded files.

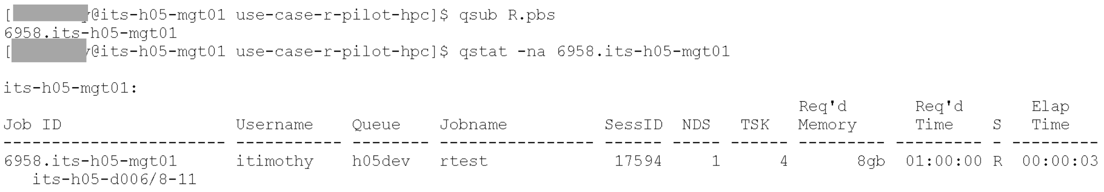
```
$ cd use-case-r-pilot-hpc

$ ls
```



```
[[redacted]@its-h05-mgt01 ~]$ cd use-case-r-pilot-hpc
[[redacted]@its-h05-mgt01 use-case-r-pilot-hpc]$ ls
R.pbs  sample.R
```

2. Submit job and check status.

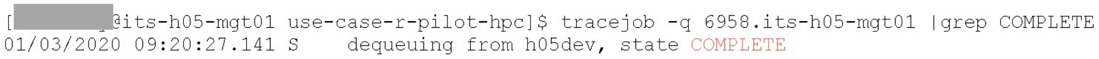
```
$ qsub R.pbs

> The JobID will be shown.

$ qstat -na JobID
```



```
[[redacted]@its-h05-mgt01 use-case-r-pilot-hpc]$ qsub R.pbs
6958.its-h05-mgt01
[[redacted]@its-h05-mgt01 use-case-r-pilot-hpc]$ qstat -na 6958.its-h05-mgt01

its-h05-mgt01:
                                                                           Req'd       Req'd       Elap
Job ID                    Username    Queue    Jobname          SessID  NDS   TSK    Memory      Time    S   Time
------------------------ ----------- -------- ---------------- ------ ----- ------ --------- --------- - ---------
6958.its-h05-mgt01        itimothy    h05dev   rtest             17594     1      4       8gb  01:00:00 R  00:00:03
   its-h05-d006/8-11
```

3. The job will be running, and you will see “COMPLETE” with the following command.

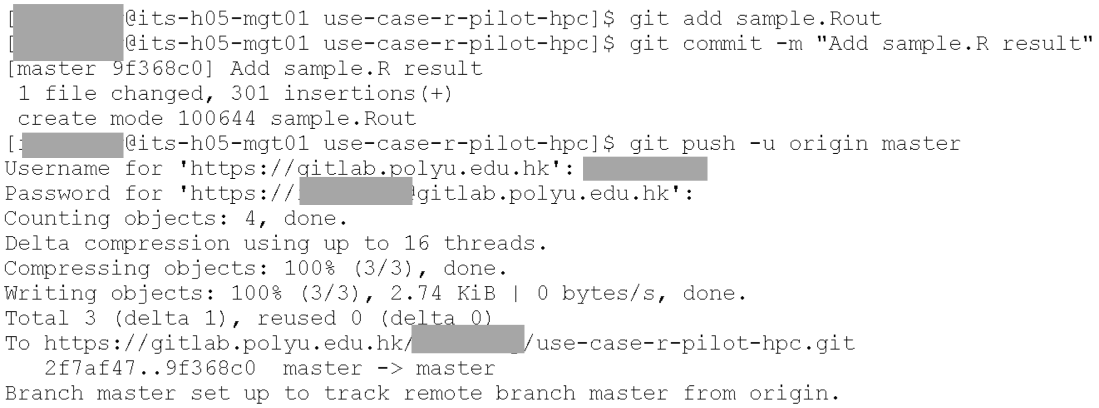
```
tracejob -q JobID |grep COMPLETE
```



```
[[redacted]@its-h05-mgt01 use-case-r-pilot-hpc]$ tracejob -q 6958.its-h05-mgt01 |grep COMPLETE
01/03/2020 09:20:27.141 S    dequeuing from h05dev, state COMPLETE
```

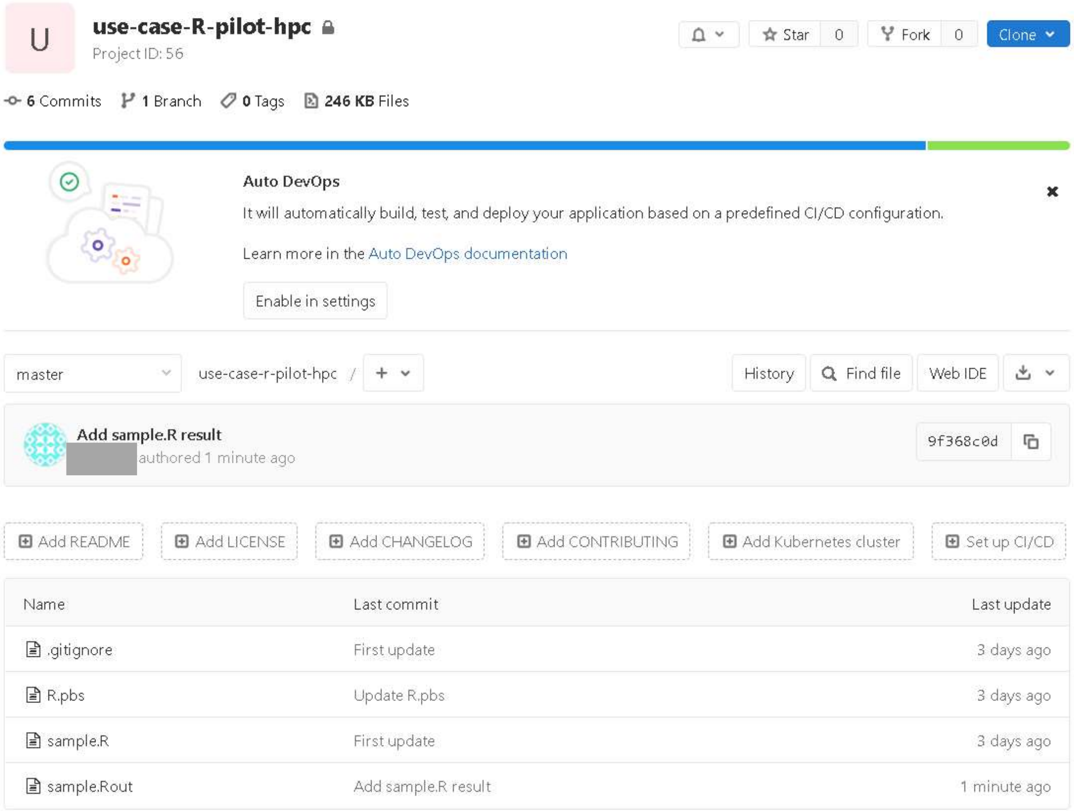
4. Using the command as below to synchronize the result to Git.

```
$ git add sample.Rout
$ git commit -m “add sample.R result”
$ git push -u origin master
```



```
[[redacted]@its-h05-mgt01 use-case-r-pilot-hpc]$ git add sample.Rout
[[redacted]@its-h05-mgt01 use-case-r-pilot-hpc]$ git commit -m "Add sample.R result"
[master 9f368c0] Add sample.R result
 1 file changed, 301 insertions(+)
 create mode 100644 sample.Rout
[[redacted]@its-h05-mgt01 use-case-r-pilot-hpc]$ git push -u origin master
Username for 'https://gitlab.polyu.edu.hk': [redacted]
Password for 'https://[redacted]gitlab.polyu.edu.hk':
Counting objects: 4, done.
Delta compression using up to 16 threads.
Compressing objects: 100% (3/3), done.
Writing objects: 100% (3/3), 2.74 KiB | 0 bytes/s, done.
Total 3 (delta 1), reused 0 (delta 0)
To https://gitlab.polyu.edu.hk/[redacted]/use-case-r-pilot-hpc.git
   2f7af47..9f368c0  master -> master
Branch master set up to track remote branch master from origin.
```

5. Reload the page in Git and check if the new file (sample.Rout) has been uploaded.



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Learn more in the Auto DevOps documentation

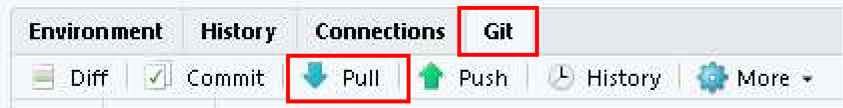
Add sample.R result

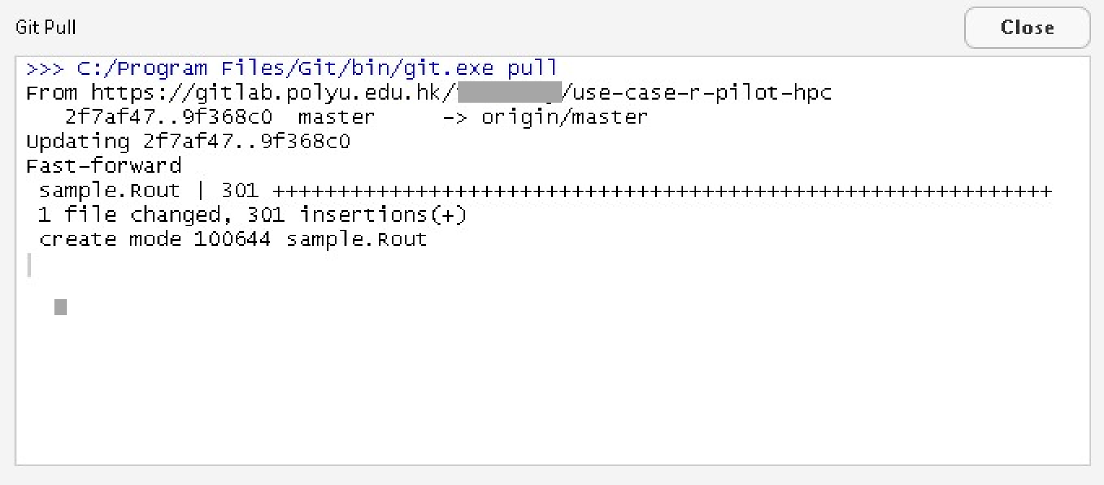
[redacted] authored 1 minute ago

Name	Last commit	Last update
.gitignore	First update	3 days ago
R.pbs	Update R.pbs	3 days ago
sample.R	First update	3 days ago
sample.Rout	Add sample.R result	1 minute ago

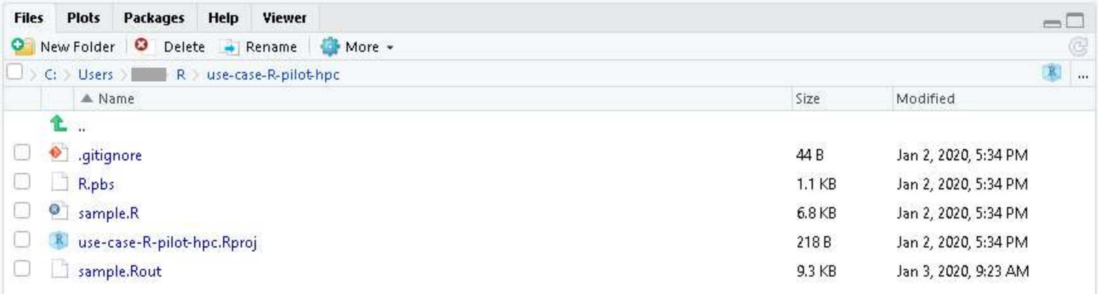
F) Synchronize the result to RStudio from Git

1. Click “Git” in RStudio.
2. Click “Pull” to get the update in RStudio.
3. The result will be updated from Git.





```
>>> C:/Program Files/Git/bin/git.exe pull
From https://gitlab.polyu.edu.hk/[redacted]/use-case-r-pilot-hpc
   2f7af47..9f368c0  master     -> origin/master
Updating 2f7af47..9f368c0
Fast-forward
 sample.Rout | 301 ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
 1 file changed, 301 insertions(+)
 create mode 100644 sample.Rout
```



Name	Size	Modified
..		
.gitignore	44 B	Jan 2, 2020, 5:34 PM
R.pbs	1.1 KB	Jan 2, 2020, 5:34 PM
sample.R	6.8 KB	Jan 2, 2020, 5:34 PM
use-case-R-pilot-hpc.Rproj	218 B	Jan 2, 2020, 5:34 PM
sample.Rout	9.3 KB	Jan 3, 2020, 9:23 AM

Reference

PolyU: IT Support for Research Website	
Homepage	https://www.polyu.edu.hk/its/researchsupport
GitLab Service for Research	https://www.polyu.edu.hk/its/researchsupport/en/gitlab-service-for-research/introduction/
User Guide - Get started with GitLab	https://www.polyu.edu.hk/its/researchsupport/en/gitlab-service-for-research/user-guides/
Pilot HPC Platform	https://www.polyu.edu.hk/its/researchsupport/en/pilot-hpc-platform/introduction/

If you have any question or enquiry, please contact IT HelpCentre.

Hotline: 2766 5900

WhatsApp/ WeChat: 6577 9669

Location: Room M201, Li Ka Shing Tower, PolyU

Online enquiry: IT Online ServiceDesk https://www.polyu.edu.hk/itservicedesk