

Distance learning using the Gitlab versioning system



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Similar working environment as in the IT companies

- rented server (located in Germany)
- students work in groups on a group project and
- introduced a git



example.txt



local machine



upload



example.txt



server



make some changes

example.txt



upload



The file already exists. Do you want to overwrite it?



example.txt



example(1).txt



server

local machine



What is git?

Git is an essential tool for collaborative work in IT companies.

Version Control system (VCS)

Manage versions of program code (90% of use cases)

Source code management (SCM)

Git allows us to:

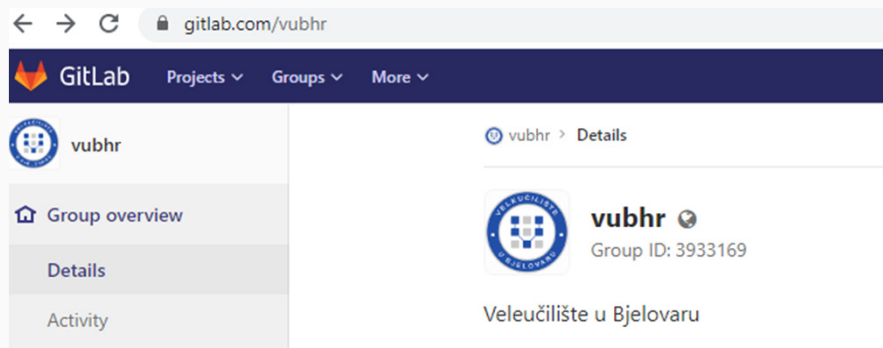
- Browse the history of all saved changes on files
- File comparison
- Push (upload) or pull (download) changes into/from a centralized system





The most famous is github.

We are using gitlab and as institution we have a premium account for all our students



root repository



Computer science department repository



Repositories for classes

Subgroups and projects Shared projects Archived projects

- prin Owner
Programsko inženjerstvo
- ksnb Owner
Korisnička sučelja na bazama
- racvid
Računarski i robotski vid
- Projekti
Projekti
- .NET
.NET programiranje
- iot
Internet stvari
- oop
Objektno orijentirano programiranje
- uup
Uvod u programiranje
- java
Osnove programskog jezika Java
- csharp
C# programiranje
- c
Programski jezik C
- web2 Owner
Web programiranje 2
- asp
Algoritmi i strukture podataka

Repository of class web2

vubhr > web2 > Details

web2 Group ID: 4510312 | Leave group

Web programiranje 2

Subgroups and projects Shared projects Archived projects

Search by name Last created

- 2020 Owner
- 2019

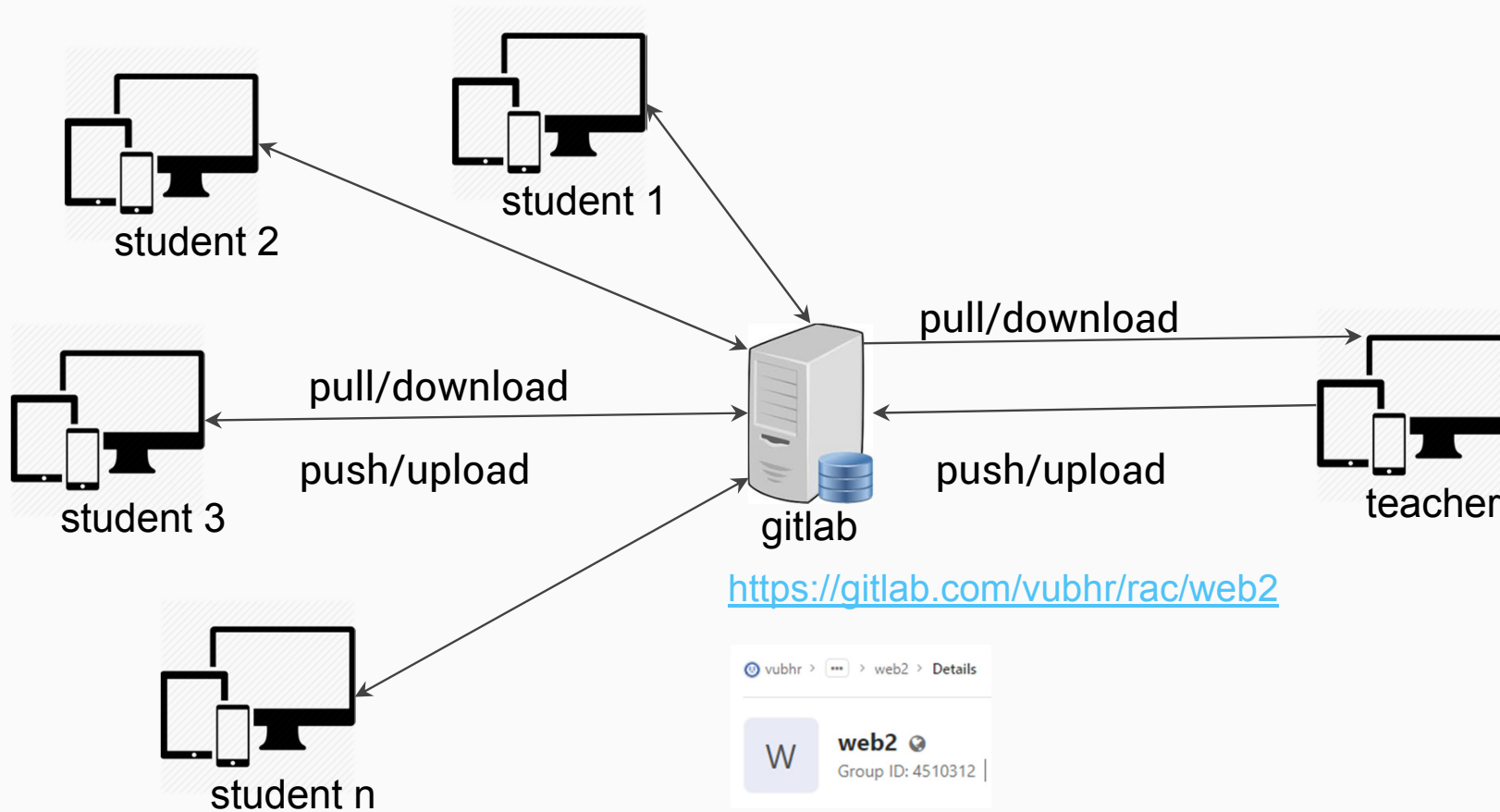
Year 2020 and students projects

vubhr > 2020 > Details

2020 Group ID: 7375878 | Leave group

Subgroups and projects Shared projects Archived projects

- Aloncar
- aredep
- asitek





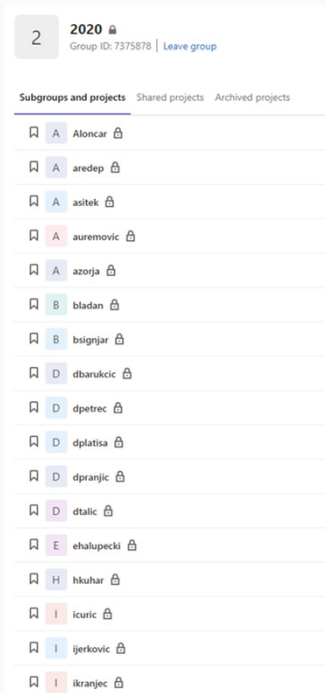
gitlab



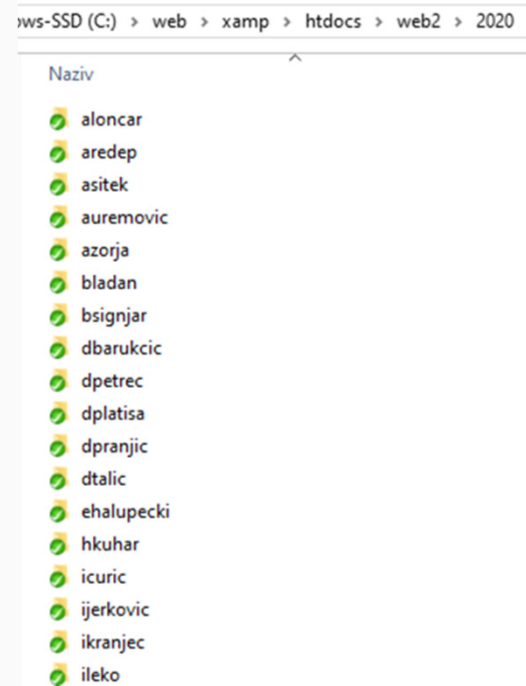
synchronized



teacher



Repository on gitlab



Repository on my local machine

In general, disadvantages of git are:







- the full functionality of the git can only be used on text files
- it is a complex tool and beginners find it very difficult to use

Tortoise git is a visual tool that makes it easy to work with git by integrating it into the operating system.

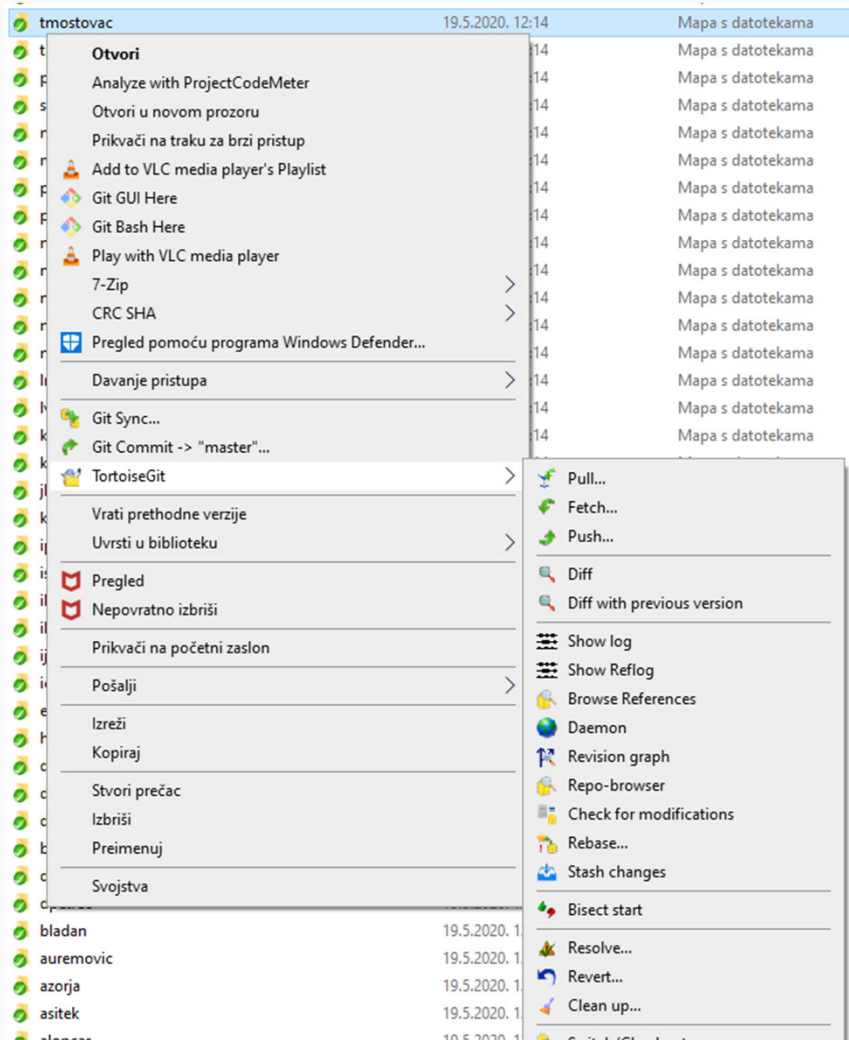




Tortoise git marks directories that are part of the git repository, and if it is not then the directory looks as usual

 some directry outside the git	22.5.2020. 12:06	Mapa s datotekama
 zzarinac	19.5.2020. 12:14	Mapa s datotekama
 vdeanovic	19.5.2020. 12:14	Mapa s datotekama
 vmilkovic	19.5.2020. 12:14	Mapa s datotekama
 tmostovac	19.5.2020. 12:14	Mapa s datotekama
 tpojatina	19.5.2020. 12:14	Mapa s datotekama

By right-clicking on the directory located in the git repository, options for working with git appears.



Some of the most important options are:

- Git Sync, synchronizes data on the server (GitLab) with the local repository
- Git Commit -> master, saves files and send to the Gitlab
- Pull - pulls certain files from GitLab to the local repository
- Push - sends certain files to the server
- Revert - restores changes
- diff - finds differences between individual commits and
- Show Logs - shows gitlog

The Git log is especially interesting if you want to track a student's progress on an assignment

C:\web\xamp\htdocs\playground\2020\tmostovac - Log Messages - TortoiseGit

master From: 19. 3.2020. To: 5. 4.2020. Filter by Subject, Messages, Paths, Authors, Emails, SHA-1, Refname, Notes Author Email

Graph	Actions	Message	Author	Date
		Working tree changes		
		master origin/master origin/HEAD zadnji zadatak ne šlj...	Tony Mostovac	5.4.20...
		jedva	Tony Mostovac	2.4.202...
		improved, cak je ovo i bolje	Tony Mostovac	2.4.202...
		test	Tony Mostovac	2.4.202...
		help teacher	Tony Mostovac	2.4.202...
		help	Tony Mostovac	2.4.202...
		kil me	Tony Mostovac	2.4.202...
		Final, lab4 done	Tony Mostovac	26.3.20...
		Add zadatak4	Tony Mostovac	26.3.20...
		Labaratorjeske vjezbe 4, zadatak 1 i 2 , add	Tony Mostovac	26.3.20...
		krivo korištenje break-a i ifa	Tomislav Adamović	21.3.20...
		dodan zadnji zadatak	Tony Mostovac	21.3.20...
		uljepšavanje	Tony Mostovac	21.3.20...
		ostao jos zadnji zadatak	Tony Mostovac	21.3.20...
		uljepšavanje	Tony Mostovac	20.3.20...
		izmjene	Tomislav Adamović	20.3.20...
		Merge branch 'master' of https://gitlab.com/vubhr/rac/web2/20...	Tomislav Adamović	20.3.20...
		Greska prikom dobivanje poruke na drop down menu, uvijek ps...	Tony Mostovac	20.3.20...
		oke, sad je stvarno final sto ce tice zadatka 1	Tony Mostovac	20.3.20...
		opet male dorade	Tomislav Adamović	20.3.20...
		malo sam napravio dorade dodao sam isset funkciju koja provjer...	Tomislav Adamović	20.3.20...
		final	Tony Mostovac	20.3.20...
		Intial commt	Tomislav Adamović	19.3.20...

SHA-1: 29d523f516914447a922c36f6612fbb686e3b7b7

		Add zadatak4	Tony Mostovac	26.3.20...
		Labaratorjeske vjezbe 4, zadatak 1 i 2 , add	Tony Mostovac	26.3.20...
		krivo korištenje break-a i ifa	Tomislav Adamović	21.3.20...
		dodan zadnji zadatak	Tony Mostovac	21.3.20...
		uljepšavanje	Tony Mostovac	21.3.20...
		ostao jos zadnji zadatak	Tony Mostovac	21.3.20...
		uljepšavanje	Tony Mostovac	20.3.20...
		izmjene	Tomislav Adamović	20.3.20...
		Merge branch 'master' of https://gitlab.com/vubhr/rac/web2/20...	Tomislav Adamović	20.3.20...

- Compare with working tree
- Show changes as unified diff
- Compare with previous revision
- Browse repository
- Merge to "master"...



In order to process all the information that git gives us, I wrote four scripts.

- pulls.sh, allows us to retrieve all student's changes from the previous day
- gitlog2json.sh, allows us to retrieve git logs from the previous day
- compare.php, compares all the files uploaded by the students

```
student1/3zadatak1.php - student2/3zadatak1.php- similarity2 : 443 (94.456289978678 %)  
student1/3zadatak1.php - student3/3zadatak1.php- similarity2 : 471 (95.440729483283 %)  
student1/3zadatak1.php - student4/3zadatak1.php- similarity2 : 478 (100 %)  
student1/3zadatak2.php - student3/3zadatak2a.php- similarity2 : 1710 (91.175686483604 %)  
student1/3zadatak2.php - student4/3zadatak2.php- similarity2 : 1749 (100 %)  
student1/3zadatak3.php - student1/3zadatak4.php- similarity2 : 2529 (98.042256251211 %)  
student1/3zadatak3.php - student4/3zadatak3.php- similarity2 : 2533 (100 %)
```

- The fourth script, differences.php allows us to visually review two suspicious files



git data processing

```
<!-- Inicijalizacija !-->
```

```
<?php
  if(isset($_GET['ime'])){
    $ime=$_GET['ime'];
  }else{
    $ime="";
  }
}
```

```
if(isset($_GET['prezime'])){
  $prezime=$_GET['prezime'];
}else{
  $prezime="";
}
}
```

```
if(isset($_GET['godiste'])){
  $godiste=$_GET['godiste'];
}else{
  $godiste="";
}
}
```

```
if(isset($_GET['spol'])){
  $spol=$_GET['spol'];
}else{
  $spol="";
}
}
```

```
if(isset($_GET['email'])){
  $email=$_GET['email'];
}else{
  $email="";
}
}
```

```
if(isset($_GET['password'])){
  $password=$_GET['password'];
}else{
  $password="";
}
}
```

```
<?php
  if(isset($_GET['ime'])){
    $ime=$_GET['ime'];
  }else{
    $ime="";
  }
}
```

```
if(isset($_GET['prez'])){
  $prez=$_GET['prez'];
}else{
  $prez="";
}
}
```

```
if(isset($_GET['god'])){
  $god=$_GET['god'];
}else{
  $god="";
}
}
```

```
if(isset($_GET['spol'])){
  $spol=$_GET['spol'];
}else{
  $spol="";
}
}
```

```
if(isset($_GET['email'])){
  $email=$_GET['email'];
}else{
  $email="";
}
}
```

```
if(isset($_GET['pass'])){
  $pass=$_GET['pass'];
}else{
  $pass="";
}
}
```

comment deleted

prez instead of prezime

god instead of godiste

pass instead of password



By automating scripts on our server, it will provide us additional opportunities like estimating the complexity of the code.

When we do this, we will be able to say:

- Who wrote the most active lines of code
- do you write enough comments
- do you write buggy code
- how complex is the code you wrote
- comparison of all parameters with all other students
- guidelines for students on how they can progress in their work
- sending the reports
- suggest grading for students assignments

It will allow us to monitor and manage student progress



Conclusion

Our goal is to provide an environment similar to IT companies so that students get used to future work as soon as possible and gain as much experience as possible for future work. Insight into what students are doing and how they are doing, by automating the monitoring system, will allow us to focus on important issues that the system would recognize early on.

Remote work is often used in IT companies.

This way you can work with anyone in the world wherever there is an internet and anytime.

So, this crisis has enabled us to make the most of the potential of remote work that students will be able to use in future work.

