NOTTINGHAM TRENT UNIVERSITY

School of Science and Technology

SOFT20111 - Software Engineering

Portfolio 5 - Merging : Theory and Practice

Name : Kong Yng Yng
Student ID : A4339

Version Control

A Version Control System, also known as a Revision Control System, is a system that tracks and records changes made to a file or a directory. These recorded changes can be accessed at a later time for reference purposes.

Most of the version control system currently available provides a transparent control over the repository. This means that all changes made by any users which has access to the said repository will be recorded, along with the reasons with the modification. This way, there will not be any arguments between who has the latest copy of a certain project as version control system only shows the latest version of a file. If you are doing a project in a team, a good version control system, in this case, GitHub, which is a web-based version control system that hosts repositories online, is a suitable choice.

There are several basic functions that a version control system provides. First there is the committing. Committing (check in)means updating in the version control system to let the system know about your changes and then store them in the repository. If the changes made are local, and not committed, other collaborators of the same project will not have access to them and of course, the version control system will not have any record of the changes.

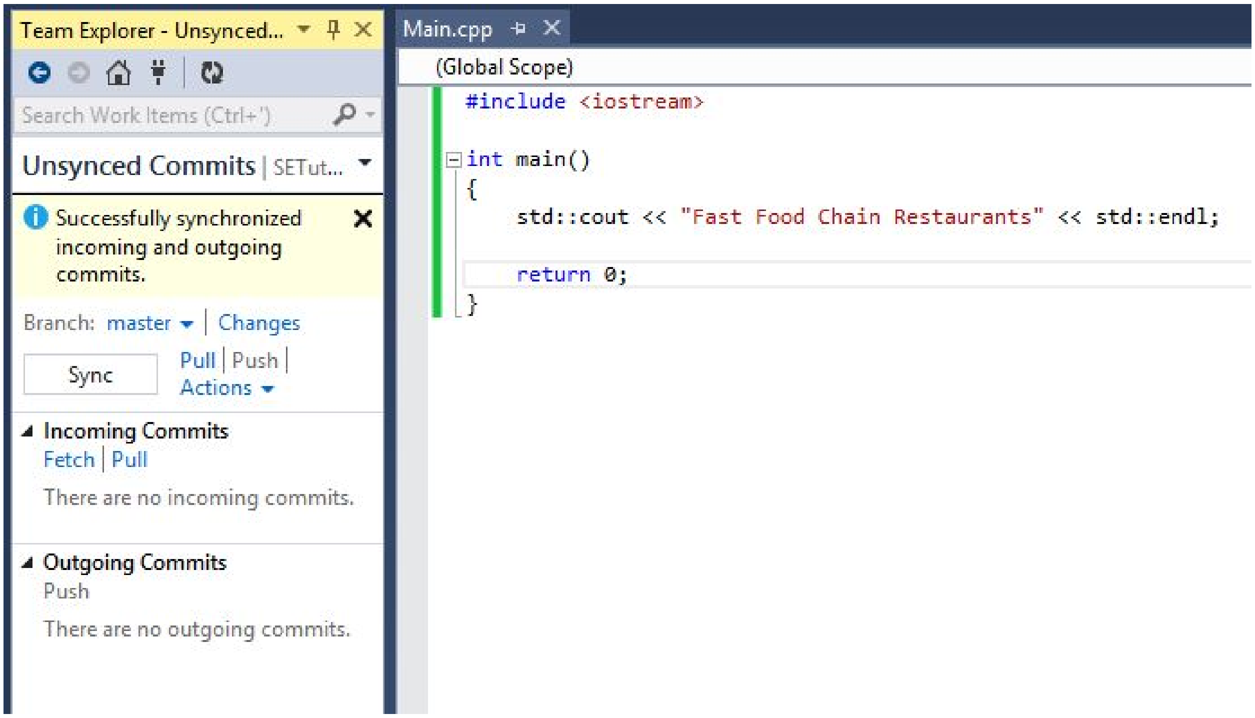
Next, check out is where you copy a repository to create a local working repository. This allows you to make the necessary modifications to the files in the copied repository before committing them to the original repository.

When a few people are working on a project together, sometimes there will be conflicts, for example two person made changes and committed them almost at the same time. In cases like this, the version control system will provide a way to view the difference between the conflicting versions, allowing you to make a choice. You can either edit the files manually to merge the options, or allow one revision to win over the other.

Also, when working in a team on a project, branching off some of the files before modifying them will be a good option. Branching is duplication of an object, in this case, a file from master (where the file originated from) so that it can be modified without affecting the original file. Once a person is certain that the changes made in the branch is working, they can merge it with the parent branch.

Demonstration

This is an example of using version control with a collaborator.



Successfully synchronized incoming and outgoing commits.

There are no incoming commits.

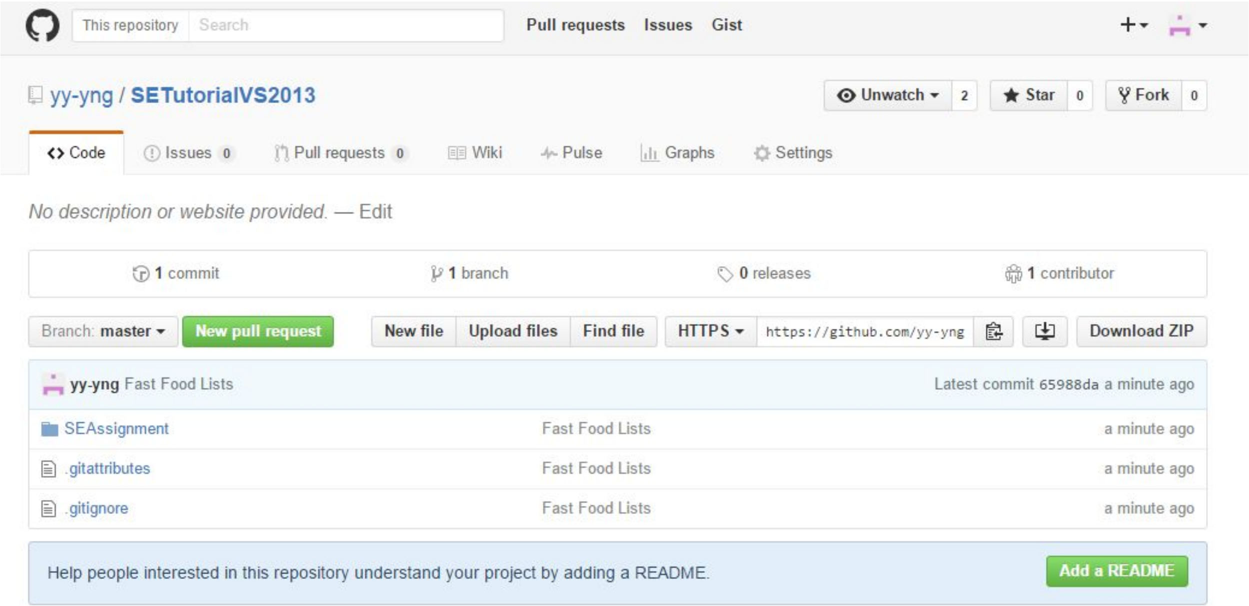
There are no outgoing commits.

```
#include <iostream>

int main()
{
    std::cout << "Fast Food Chain Restaurants" << std::endl;

    return 0;
}
```

Figure 1



No description or website provided. — Edit

1 commit | 1 branch | 0 releases | 1 contributor

https://github.com/yy-yng

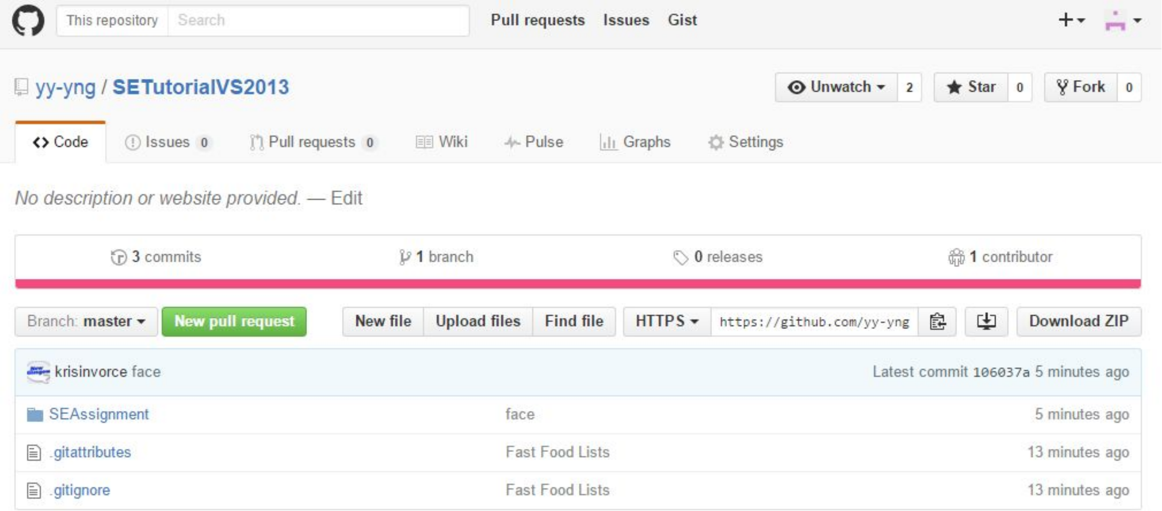
yy-yng Fast Food Lists — Latest commit 65988da a minute ago

SEAssignment	Fast Food Lists	a minute ago
.gitattributes	Fast Food Lists	a minute ago
.gitignore	Fast Food Lists	a minute ago

Help people interested in this repository understand your project by adding a README.

Figure 2

Figure 1 and Figure 2 shows the first commit to the repository.

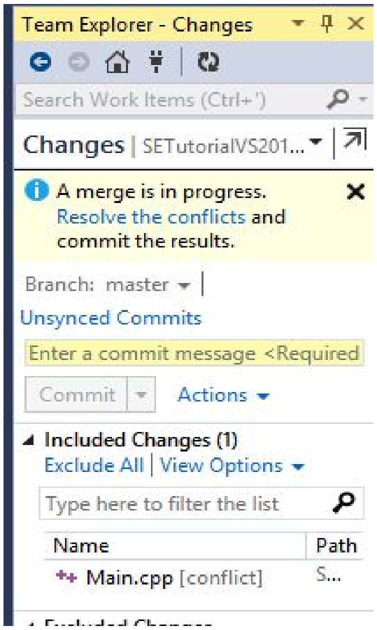


krisinvorce face | Latest commit 106037a 5 minutes ago

SEAssignment	face	5 minutes ago
.gitattributes	Fast Food Lists	13 minutes ago
.gitignore	Fast Food Lists	13 minutes ago

Figure 3 shows latest commit by the collaborator.

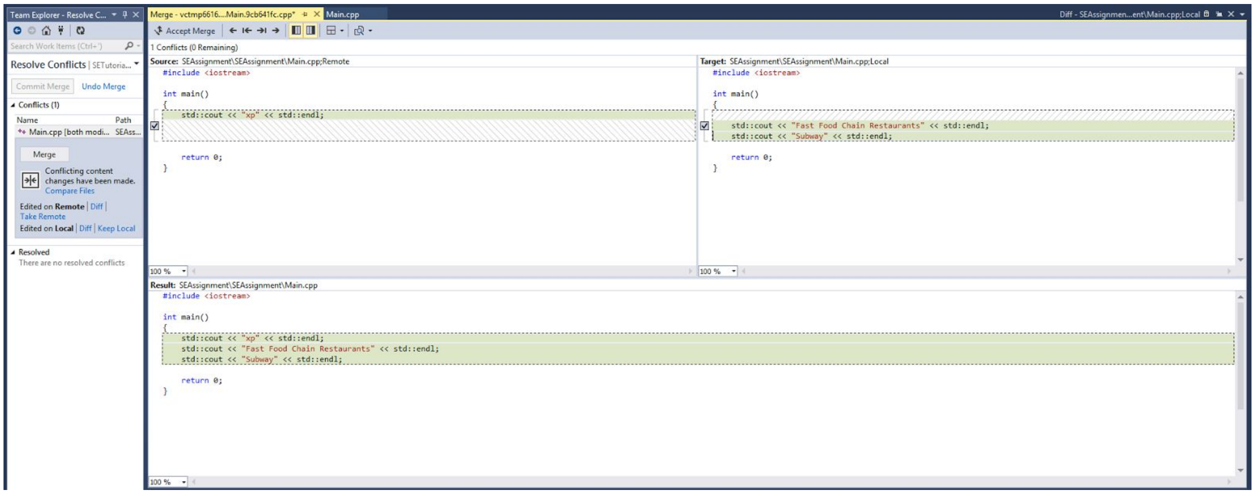
When user try to commit another version of the same file before fetching the latest version from GitHub, a message showing conflict has happened will appear and users can choose to keep the current version, the latest version by the collaborator or merge both versions.


Team Explorer - Changes
Search Work Items (Ctrl+')
Changes | SETutorialVS201...
Branch: master
Unsynced Commits
Enter a commit message <Required
Commit
Actions
Included Changes (1)
Exclude All | View Options
Type here to filter the list
Excluded Changes

A merge is in progress. Resolve the conflicts and commit the results.

Name	Path
Main.cpp [conflict]	S...

Figure 4 shows that merging is in progress..


Team Explorer - Resolve C...
Search Work Items (Ctrl+')
Resolve Conflicts | SETutoria...
Commit Merge
Undo Merge
Conflicts (1)
Name
Path
Main.cpp [both modi...
SEAss...
Merge
Compare Files
Edited on Remote | Diff |
Take Remote
Edited on Local | Diff | Keep Local
Resolved
Merge - vctmp6616....Main.9cb641fc.cpp*
Main.cpp
Diff - SEAssignmen...ent\Main.cpp;Local
Accept Merge
100 %

Conflicting content changes have been made.

There are no resolved conflicts

1 Conflicts (0 Remaining)

Source: SEAssignment\SEAssignment\Main.cpp;Remote

```
#include <iostream>

int main()
{
☑   std::cout << "xp" << std::endl;


    return 0;
}
```

Target: SEAssignment\SEAssignment\Main.cpp;Local

```
#include <iostream>

int main()
{

☑   std::cout << "Fast Food Chain Restaurants" << std::endl;
    std::cout << "Subway" << std::endl;

    return 0;
}
```

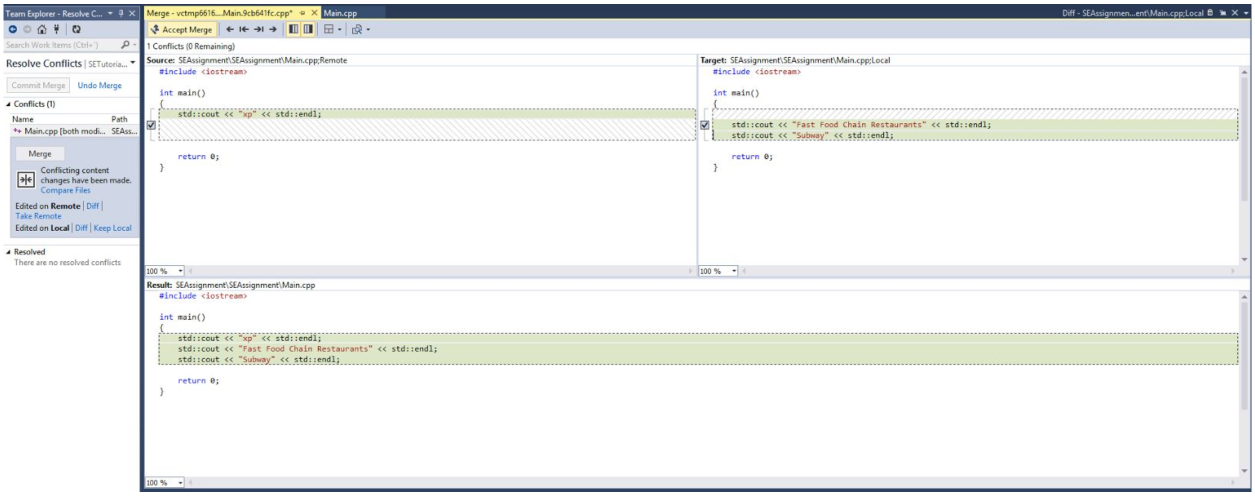
Result: SEAssignment\SEAssignment\Main.cpp

```
#include <iostream>

int main()
{
    std::cout << "xp" << std::endl;
    std::cout << "Fast Food Chain Restaurants" << std::endl;
    std::cout << "Subway" << std::endl;

    return 0;
}
```

Figure 5


Team Explorer - Resolve C...
Search Work Items (Ctrl+')
Resolve Conflicts | SETutoria...
Commit Merge
Undo Merge
Conflicts (1)
Name
Path
Main.cpp [both modi...
SEAss...
Merge
Compare Files
Edited on Remote | Diff |
Take Remote
Edited on Local | Diff | Keep Local
Resolved
Merge - vctmp6616....Main.9cb641fc.cpp*
Main.cpp
Diff - SEAssignmen...ent\Main.cpp;Local
Accept Merge
100 %

Conflicting content changes have been made.

There are no resolved conflicts

1 Conflicts (0 Remaining)

Source: SEAssignment\SEAssignment\Main.cpp;Remote

```
#include <iostream>

int main()
{
☑   std::cout << "xp" << std::endl;


    return 0;
}
```

Target: SEAssignment\SEAssignment\Main.cpp;Local

```
#include <iostream>

int main()
{

☑   std::cout << "Fast Food Chain Restaurants" << std::endl;
    std::cout << "Subway" << std::endl;

    return 0;
}
```

Result: SEAssignment\SEAssignment\Main.cpp

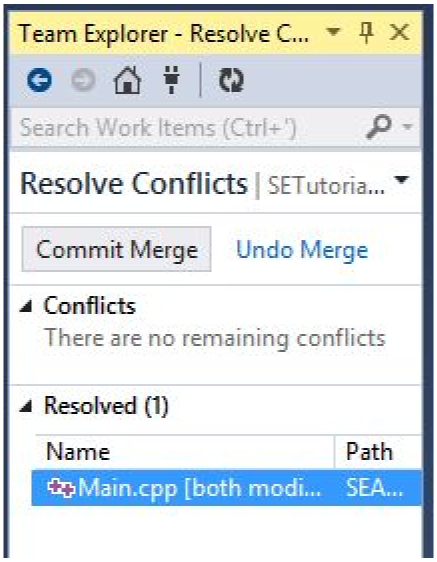
```
#include <iostream>

int main()
{
    std::cout << "xp" << std::endl;
    std::cout << "Fast Food Chain Restaurants" << std::endl;
    std::cout << "Subway" << std::endl;

    return 0;
}
```

Figure 6

Figure 5 and 6 shows the difference between versions and also the merged version. When the user accepts one of these version, it will appear in the resolved conflicts list.



Resolve Conflicts | SETutoria...

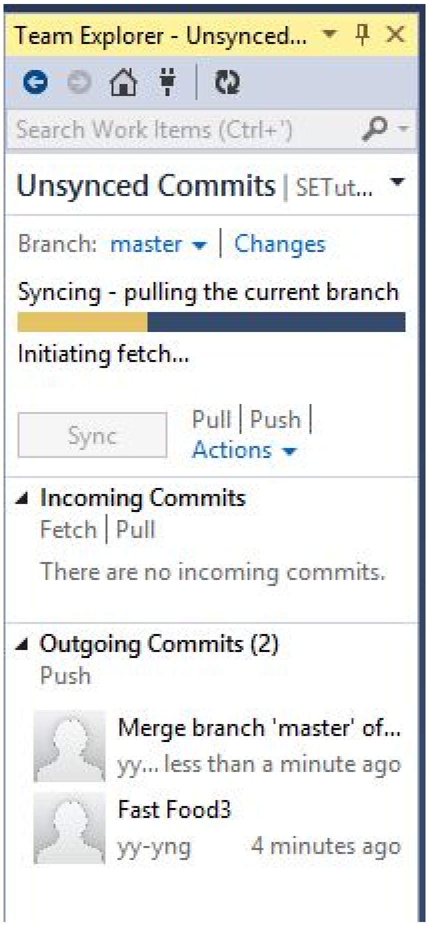
Conflicts

There are no remaining conflicts

Resolved (1)

Name	Path
Main.cpp [both modi...	SEA...

Figure 7 shows the resolved conflict list.



Unsynced Commits | SETut...

Branch: master

Syncing - pulling the current branch

Initiating fetch...

Incoming Commits

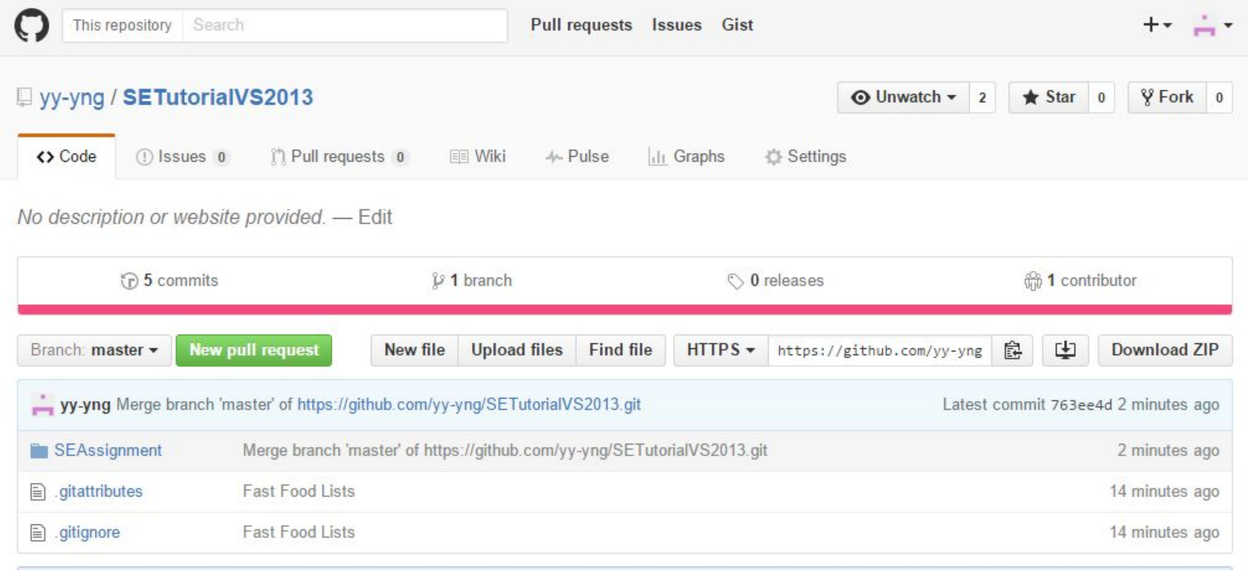
There are no incoming commits.

Outgoing Commits (2)

Merge branch 'master' of...
yy... less than a minute ago

Fast Food3
yy-yng 4 minutes ago

Figure 8 shows the syncing (committing) of the merged version



yy-yng / SETutorialVS2013

No description or website provided. — Edit

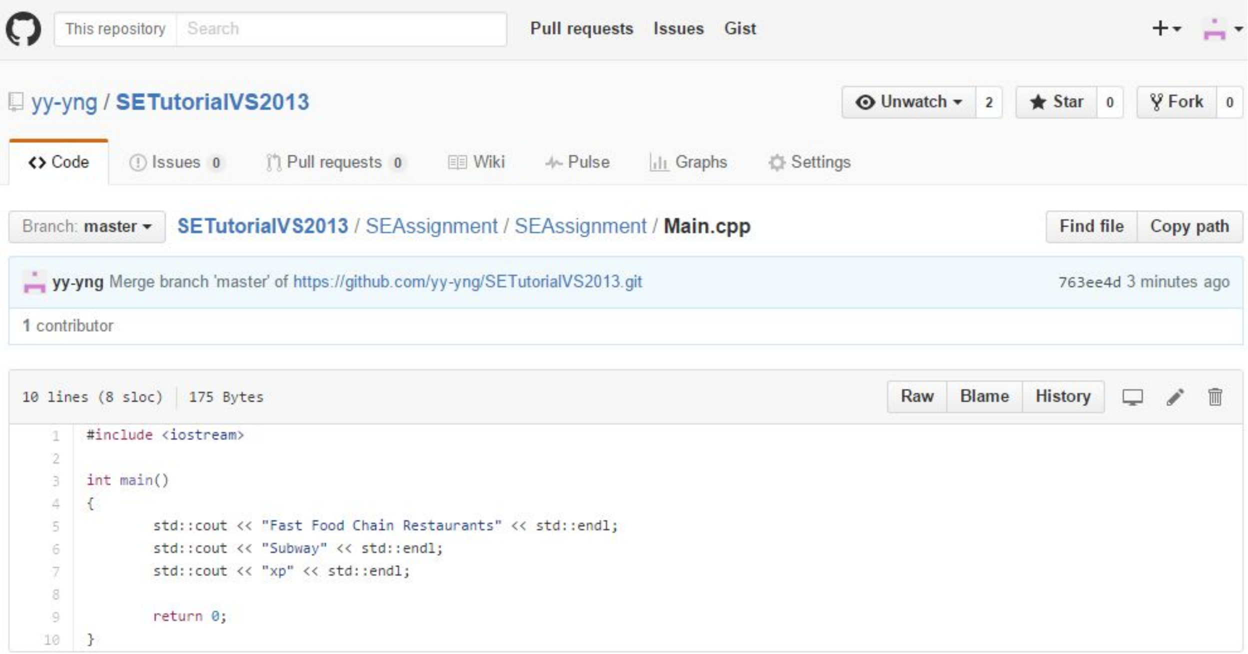
5 commits 1 branch 0 releases 1 contributor

https://github.com/yy-yng

yy-yng Merge branch 'master' of https://github.com/yy-yng/SETutorialVS2013.git Latest commit 763ee4d 2 minutes ago

SEAssignment	Merge branch 'master' of https://github.com/yy-yng/SETutorialVS2013.git	2 minutes ago
.gitattributes	Fast Food Lists	14 minutes ago
.gitignore	Fast Food Lists	14 minutes ago

Figure 8



yy-yng / SETutorialVS2013

SETutorialVS2013 / SEAssignment / SEAssignment / Main.cpp

yy-yng Merge branch 'master' of https://github.com/yy-yng/SETutorialVS2013.git 763ee4d 3 minutes ago

1 contributor

10 lines (8 sloc) | 175 Bytes

```
#include <iostream>

int main()
{
	std::cout << "Fast Food Chain Restaurants" << std::endl;
	std::cout << "Subway" << std::endl;
	std::cout << "xp" << std::endl;

	return 0;
}
```

Figure 9

Figure 8 and 9 shows the latest update to the repository, which is the merged version of the main.cpp.