Subversion

(An open source version control system)

Usage of TortoiseSVN client tool for version control

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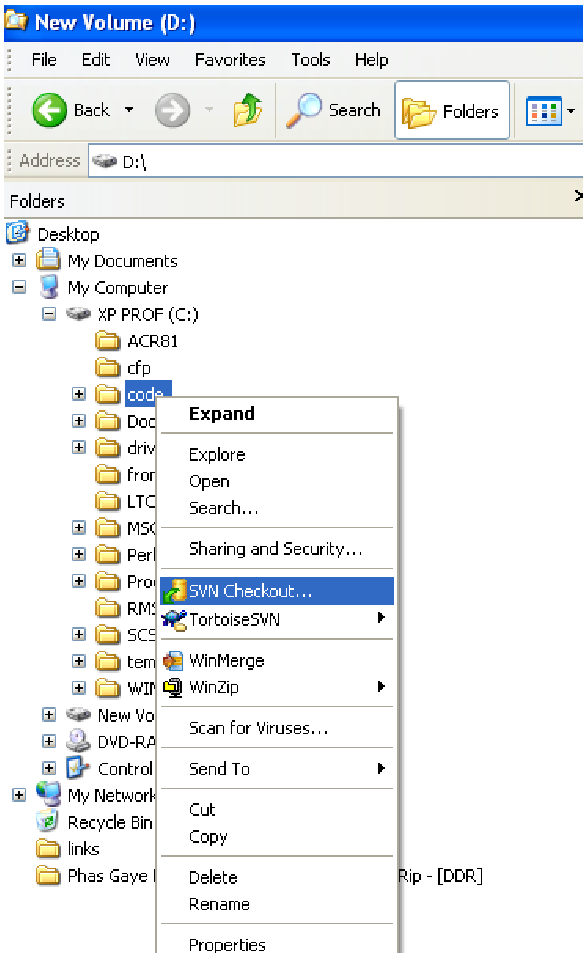
SubVersioN (SVN) Configuration Management Tool

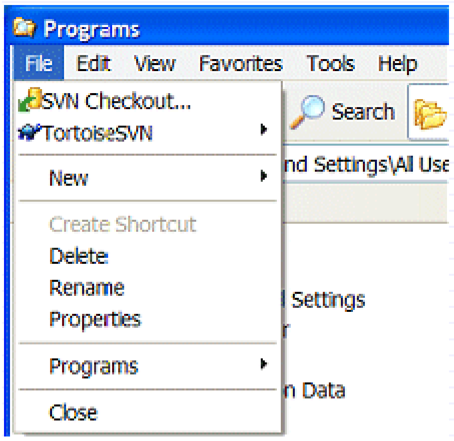
Subversion is a multi-platform open source version control system.

Subversion server: Subversion server has been installed on Linux Box: 192.168.173.112

Repository: Repository created for entire batch.

Subversion client: TortoiseSVN client has been installed on individual workstations. TortoiseSVN is a Subversion client, implemented as a windows shell extension, a plug-in to Windows Explorer. Note, that after installing TortoiseSVN client on your workstations, your Windows Explorer has extra buttons in the main menu and in the context (activated by right-clicking) menus.

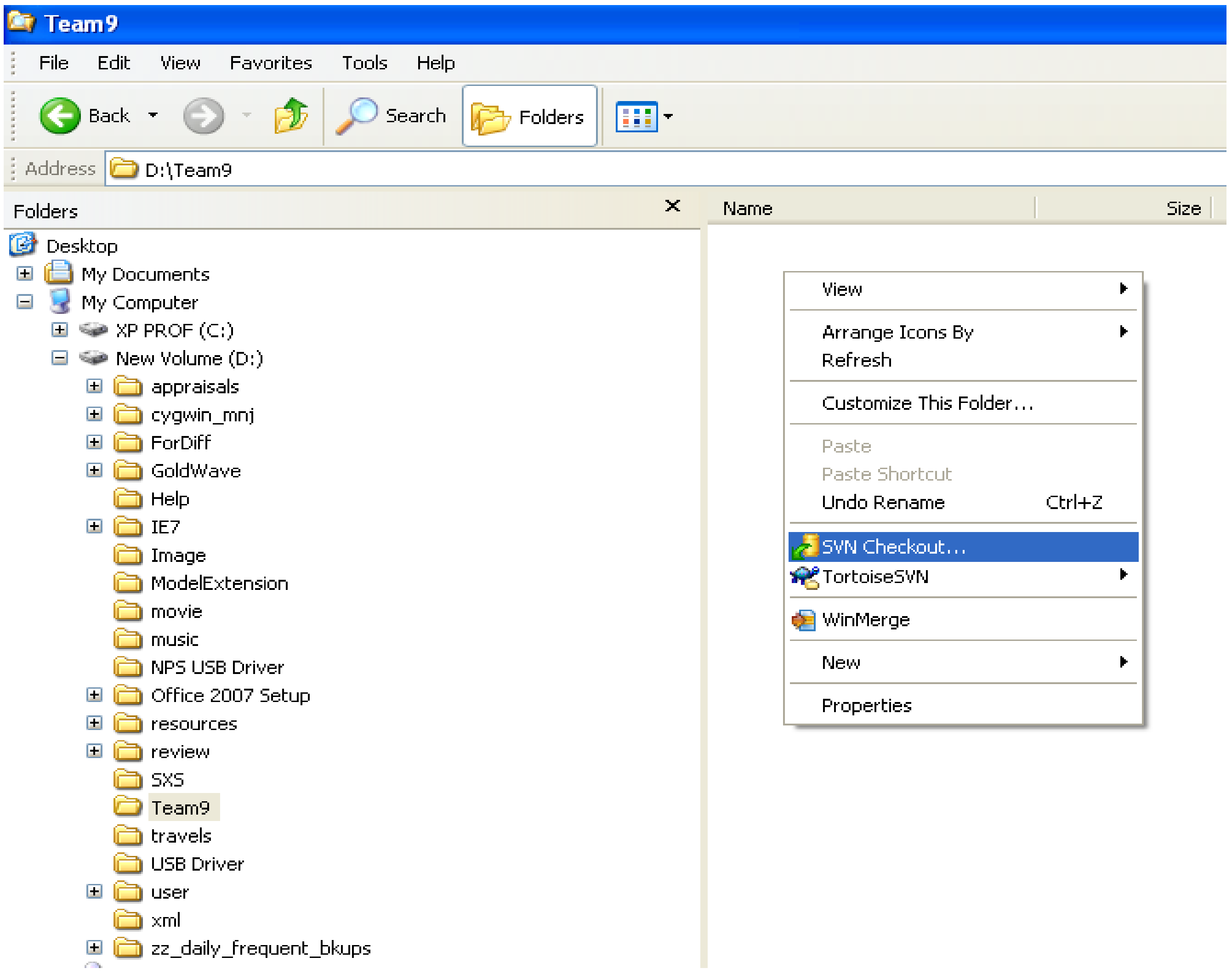




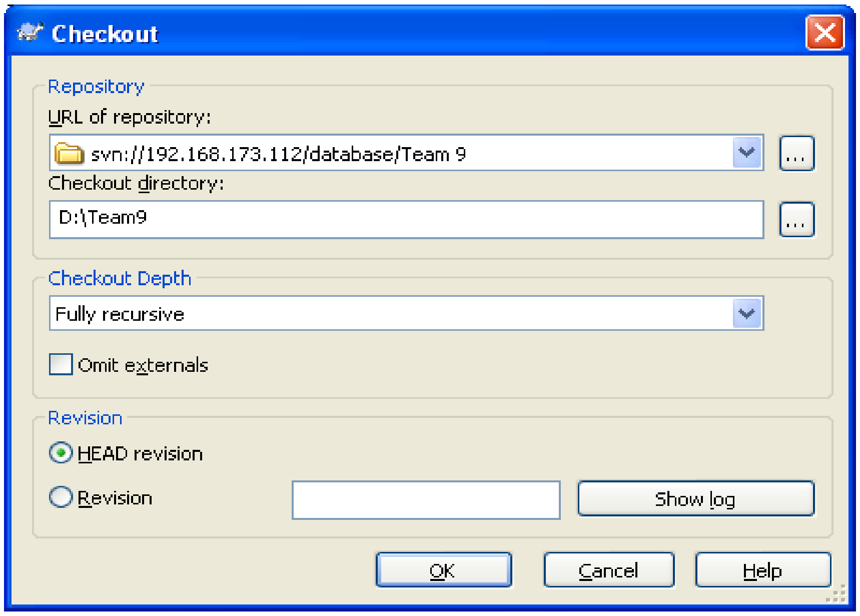
During the RLL (Real Life Lab) phase, engineers will have to store all their deliverables (source code and related documents) in the Subversion server. Below are the steps to be followed for proper usage of subversion using the TortoiseSVN client. The below steps assume the user to be “Team 9”. You will have to use your team’s username in the below steps.

Step1: Initial ‘Checkout’ of your team’s folder from SVN server

- Open windows explorer on your windows workstation.
- Create a folder with your team name. This folder will be your working directory.
- For e.g. Let us create a folder named “Team9” in D: drive. i.e. D:\Team9\
- On windows explorer, click on the “Team9” folder.
- On the empty area (on the right-hand side) right-click. A context-menu would appear (as shown in the below snapshot). Choose the “SVN Checkout…” option.



- A checkout dialog would appear (as shown in the below snapshot). In the "URL of repository:" field, type the URL path pointing to your team's repository on the subversion server. For e.g. svn://192.168.173.112/database/Team 9 NOTE: Replace "Team 9" in the URL with your team's name.



Repository

URL of repository: svn://192.168.173.112/database/Team 9

Checkout directory: D:\Team9

Checkout Depth: Fully recursive

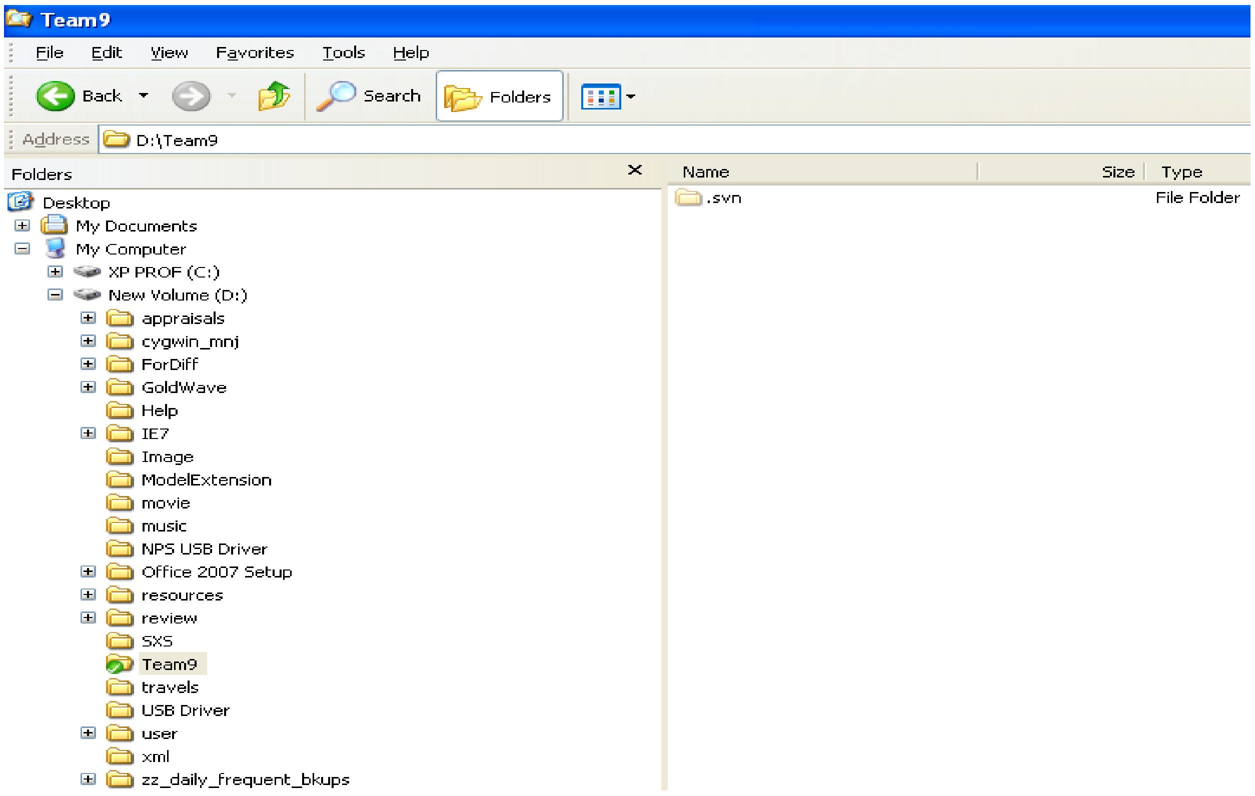
[ ] Omit externals

Revision

[● HEAD revision]

○ Revision

- Ensure that the "Checkout directory:" field is specifying the folder that you want to make your working directory.
- Click on OK. You will see a green tick icon on your working directory ("Team9" folder, in this case), a .svn folder and any other files/folders that might exist in your team's repository on the SVN server (as shown in the below snapshot)

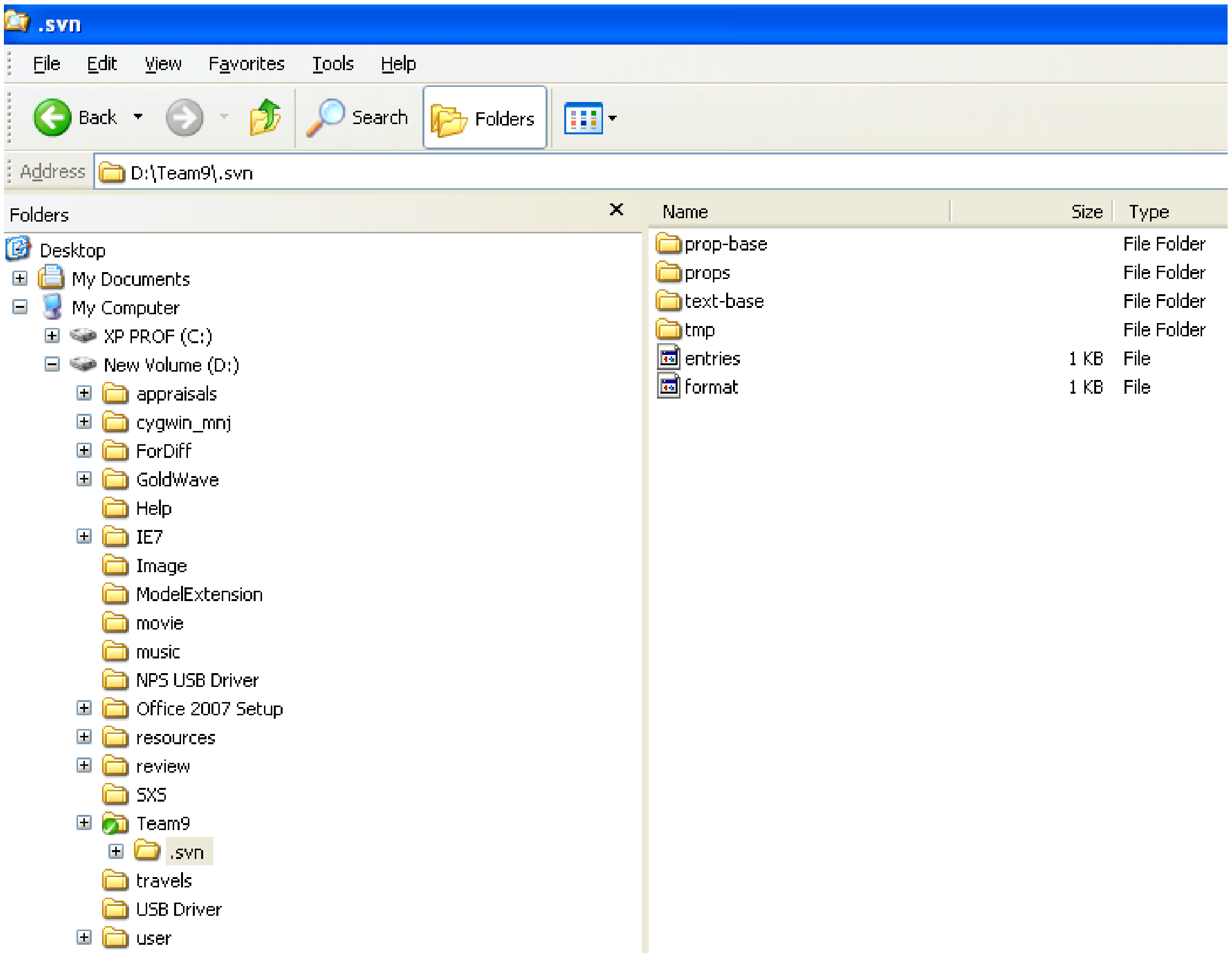


Address D:\Team9

Folders
- Desktop
  - My Documents
  - My Computer
    - XP PROF (C:)
    - New Volume (D:)
      - appraisals
      - cygwin_mnj
      - ForDiff
      - GoldWave
      - Help
      - IE7
      - Image
      - ModelExtension
      - movie
      - music
      - NPS USB Driver
      - Office 2007 Setup
      - resources
      - review
      - SXS
      - Team9
      - travels
      - USB Driver
      - user
      - xml
      - zz_daily_frequent_bkups

Name	Size	Type
.svn		File Folder

- The “.svn” folder contains some more directories which are used by subversion. You can ignore them for the time being.



Address: D:\Team9\.svn

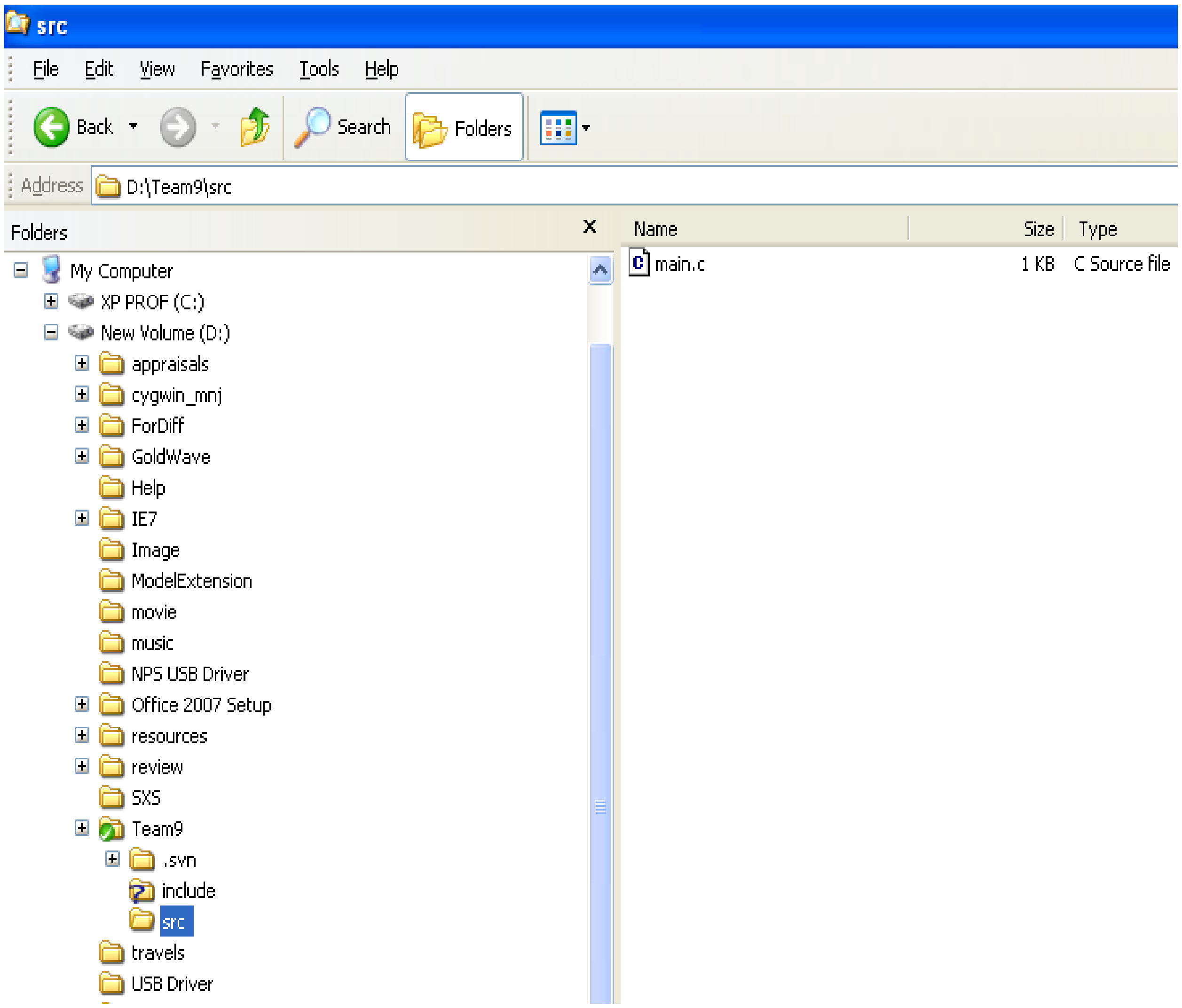
```
Desktop
  My Documents
  My Computer
    XP PROF (C:)
    New Volume (D:)
      appraisals
      cygwin_mnj
      ForDiff
      GoldWave
      Help
      IE7
      Image
      ModelExtension
      movie
      music
      NPS USB Driver
      Office 2007 Setup
      resources
      review
      SXS
      Team9
        .svn
      travels
      USB Driver
      user
```

Name	Size	Type
prop-base		File Folder
props		File Folder
text-base		File Folder
tmp		File Folder
entries	1 KB	File
format	1 KB	File

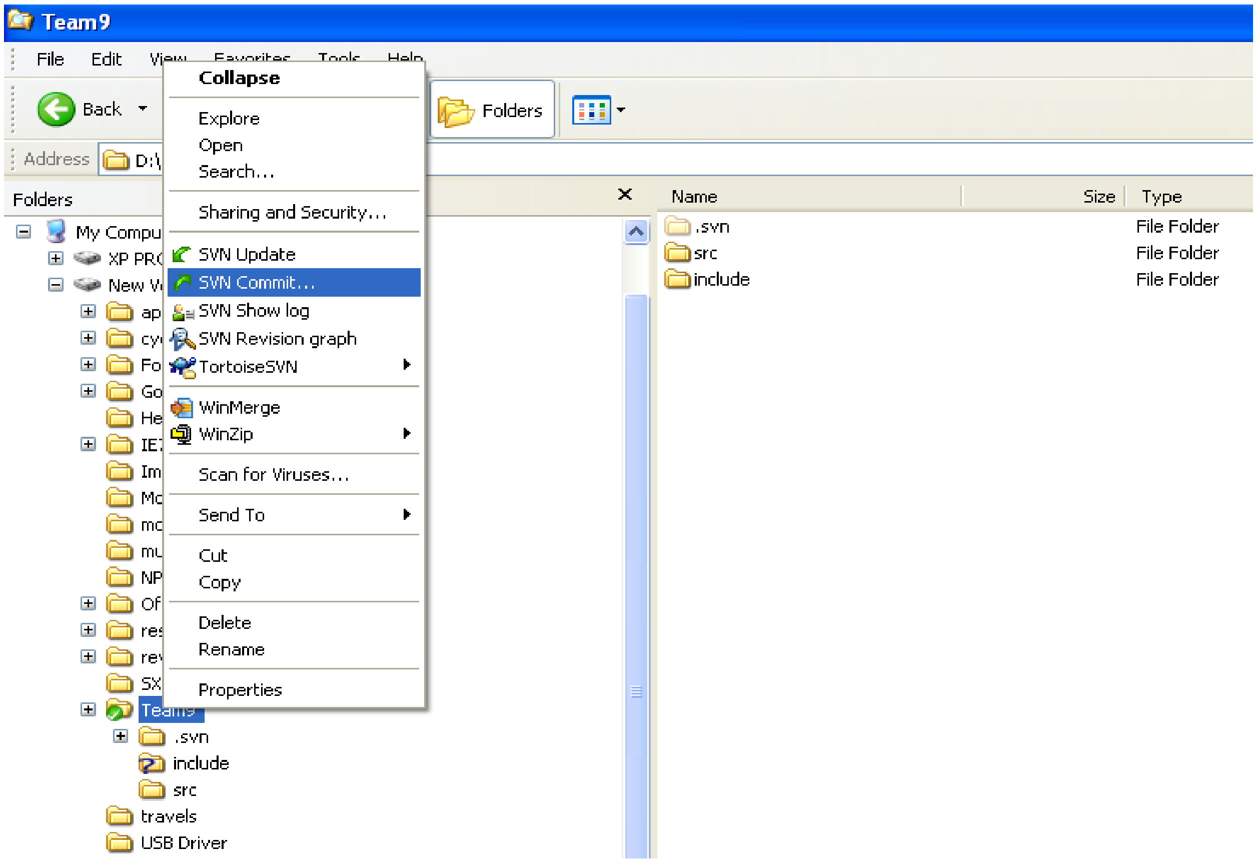
- Your team’s folder from SVN repository has now been successfully checked out (as your working directory) on your window’s workstation.
- You can now proceed with adding new files and folders in your working directory (using the steps mentioned below)

Step2: Adding new files and folders to your SVN repository

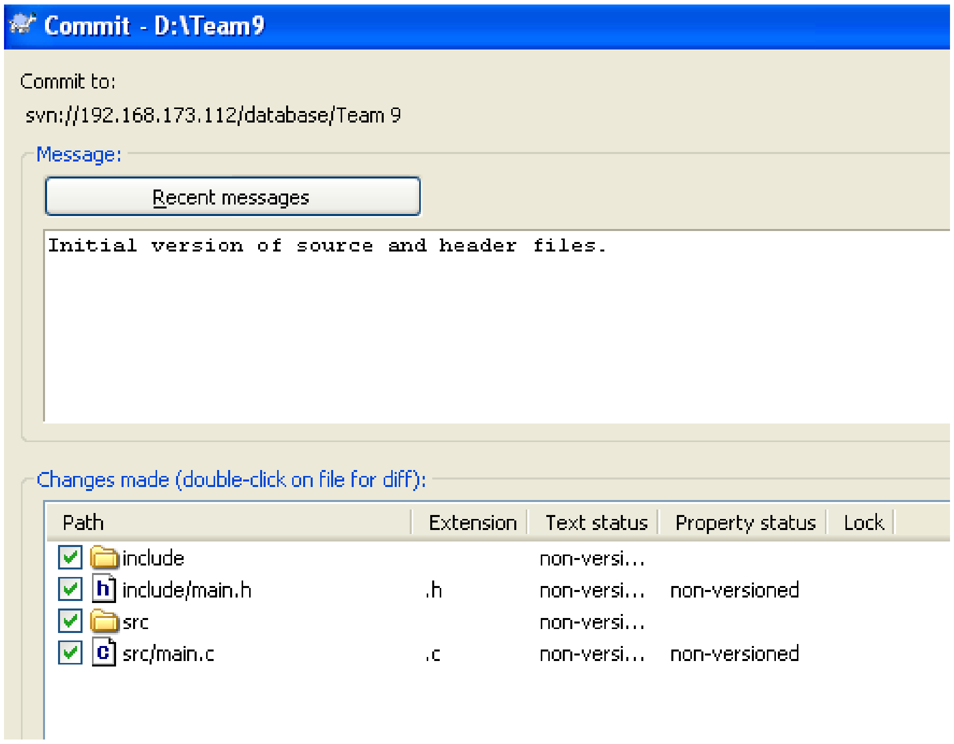
- Once you are ready with some source files, or documents , or folders that need to be added to your SVN repository, you must create those folders and files within your working directory (on the windows workstation) and perform an "SVN commit…" on your working directory. As an example, let us try to add a "src" directory containing "main.c" and an "include" directory containing "main.h" to our "Team 9" repository. Below are the steps to be followed –
- Copy (or create) the folders and files - "src" , "include" , main.cpp and main.h – under your working directory (which in this example is the "D:\Team9" folder)
- Below snapshot shows the new directories copied under the working directory. The new filenames and directory-names would appear to have a '?' icon on them.



- We now want to commit these changes to the SVN repository on the SVN server. Right-click on the working directory folder (Team9), and click on "SVN Commit…" (as shown in the following snapshot)



- A 'Commit' dialog will appear. You need to enter version comments for the files being checked-in...



Commit to:
svn://192.168.173.112/database/Team 9

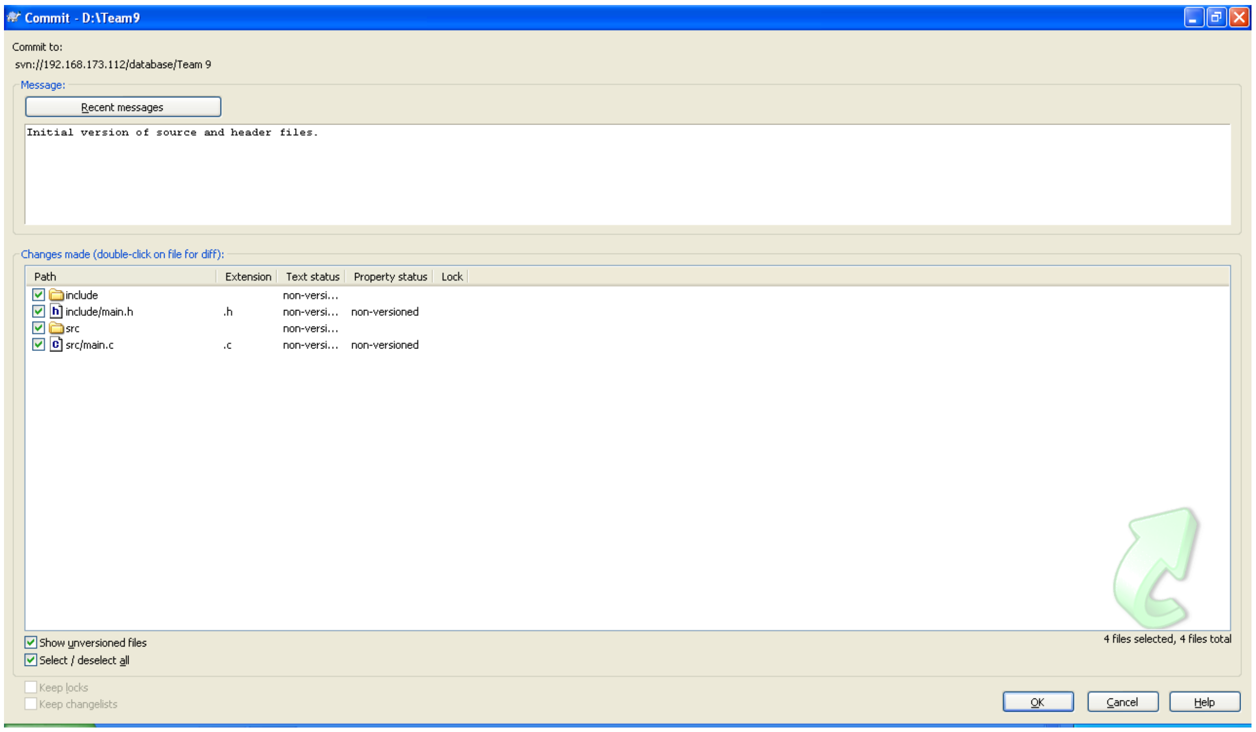
Message:

```
Initial version of source and header files.
```

Changes made (double-click on file for diff):

Path	Extension	Text status	Property status	Lock
✓ include		non-versi...		
✓ include/main.h	.h	non-versi...	non-versioned	
✓ src		non-versi...		
✓ src/main.c	.c	non-versi...	non-versioned	

- ...and click on ‘OK’ button.



Commit - D:\Team9

Commit to:
svn://192.168.173.112/database/Team 9

Message:

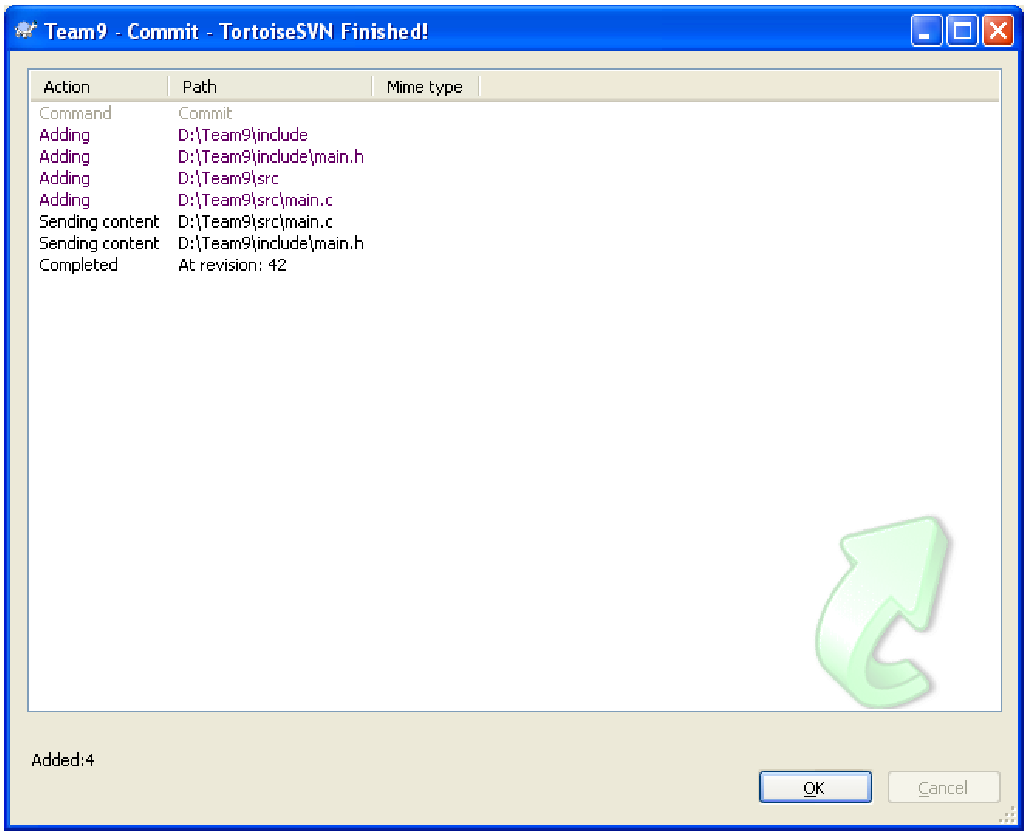
```
Initial version of source and header files.
```

Changes made (double-click on file for diff):

Path	Extension	Text status	Property status	Lock
✓ include		non-versi...		
✓ include/main.h	.h	non-versi...	non-versioned	
✓ src		non-versi...		
✓ src/main.c	.c	non-versi...	non-versioned	

✓ Show unversioned files
✓ Select / deselect all
4 files selected, 4 files total
Keep locks
Keep changelists

- The files must get added to the SVN repository and success messages would appear as shown below.

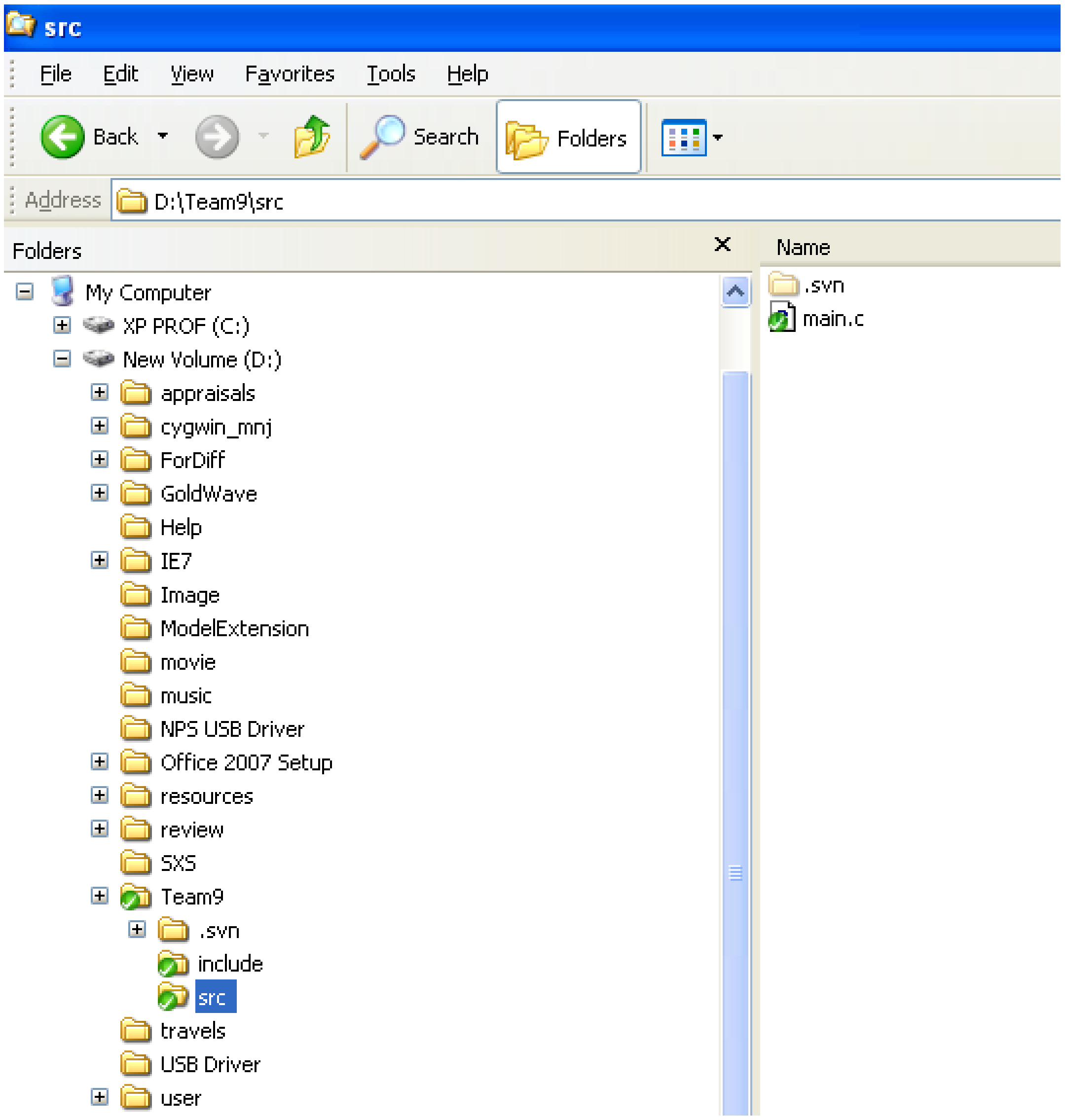


Team9 - Commit - TortoiseSVN Finished!

```
Action            Path                          Mime type
Command           Commit
Adding            D:\Team9\include
Adding            D:\Team9\include\main.h
Adding            D:\Team9\src
Adding            D:\Team9\src\main.c
Sending content   D:\Team9\src\main.c
Sending content   D:\Team9\include\main.h
Completed         At revision: 42
```

Added:4

- The new files and folders have now been successfully checked-in (committed) to the SVN repository. On your windows workstation the files will be shown with a green tick icon (as seen in below snapshot) indicating that they are in-sync with the SVN repository.



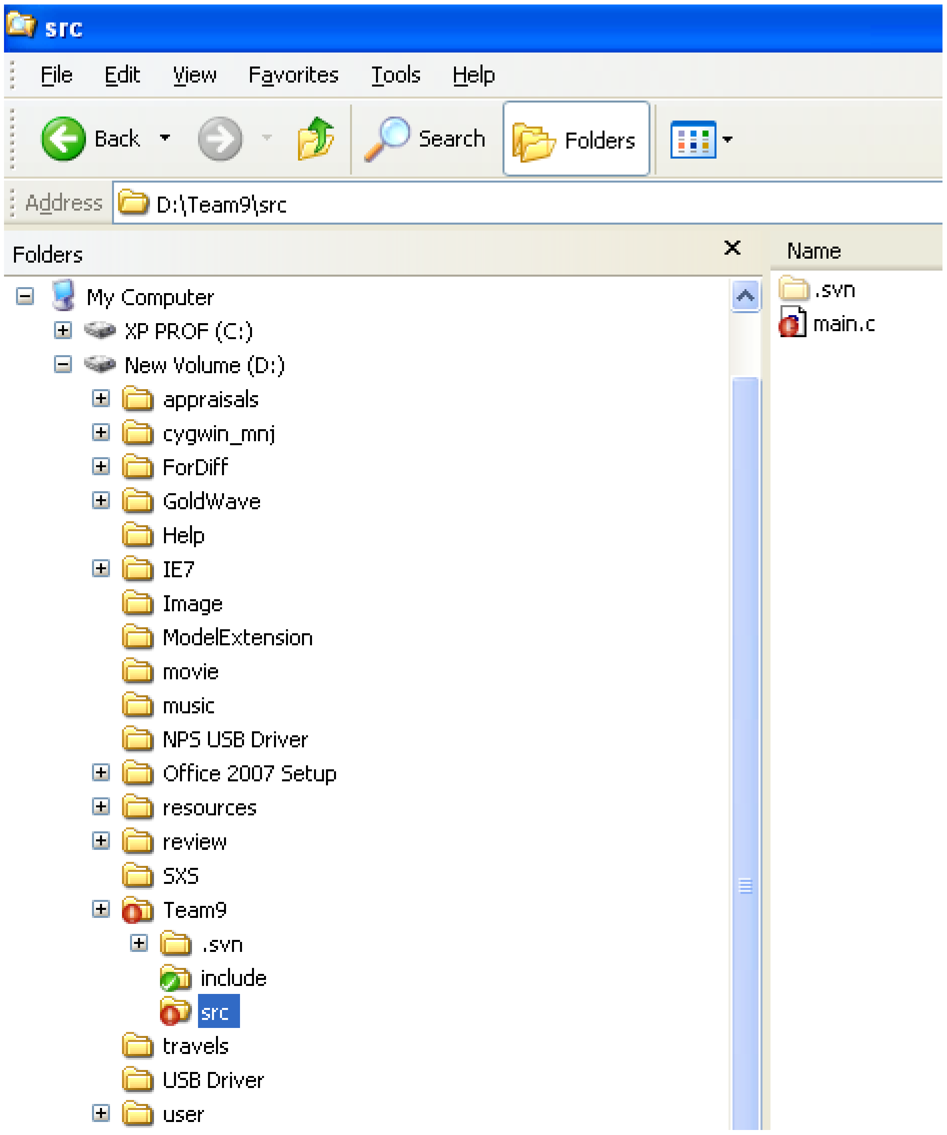
D:\Team9\src

My Computer
XP PROF (C:)
New Volume (D:)
appraisals
cygwin_mnj
ForDiff
GoldWave
Help
IE7
Image
ModelExtension
movie
music
NPS USB Driver
Office 2007 Setup
resources
review
SXS
Team9
.svn
include
src
travels
USB Driver
user

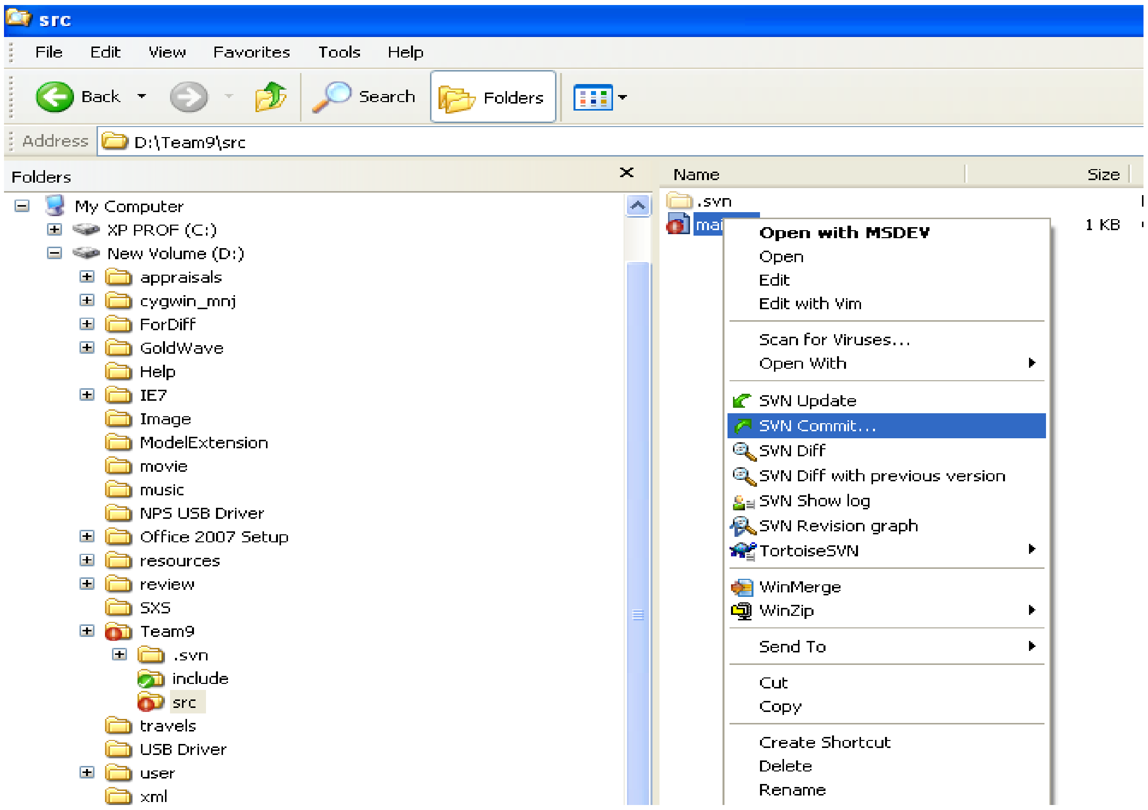
.svn
main.c

Step3: Modify files in working directory and commit the changes

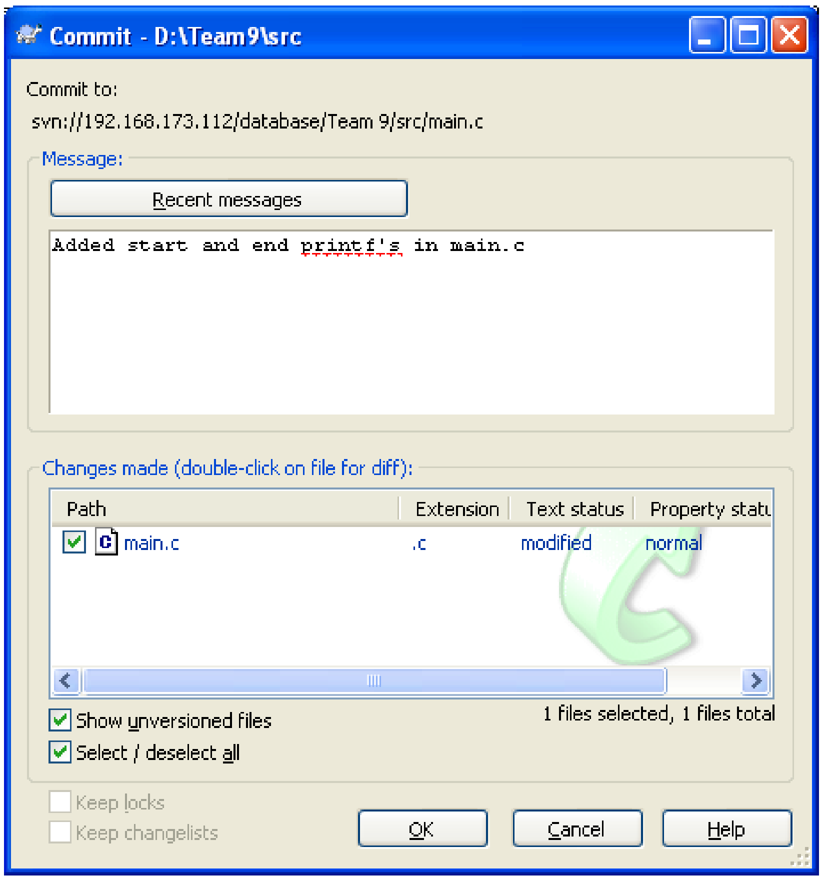
- While working in projects, one must cultivate the habit of regularly checking-in the changes into the configuration management tool (as an when the changes are in good shape). However, one needs to ensure that the check-in does not break a build.
- In the below example, assume that we are making further changes to main.c which is in our working directory. As soon as a file in the working directory changes, the green tick is replaced with a red exclamation icon on the filename and its parent folders, as shown in the below snapshot.



- When our changes to main.c are in a good shape (preferably, compiling fine and tested), we would like to check-them into the SVN repository. To check-in the changed main.c file, right-click on main.c and select “SVN Commit…” from the context menu, Add appropriate version comments for main.c and click on OK (as shown in the following three snapshots)



Address D:\Team9\src



Commit - D:\Team9\src

Commit to:
svn://192.168.173.112/database/Team 9/src/main.c

Message:

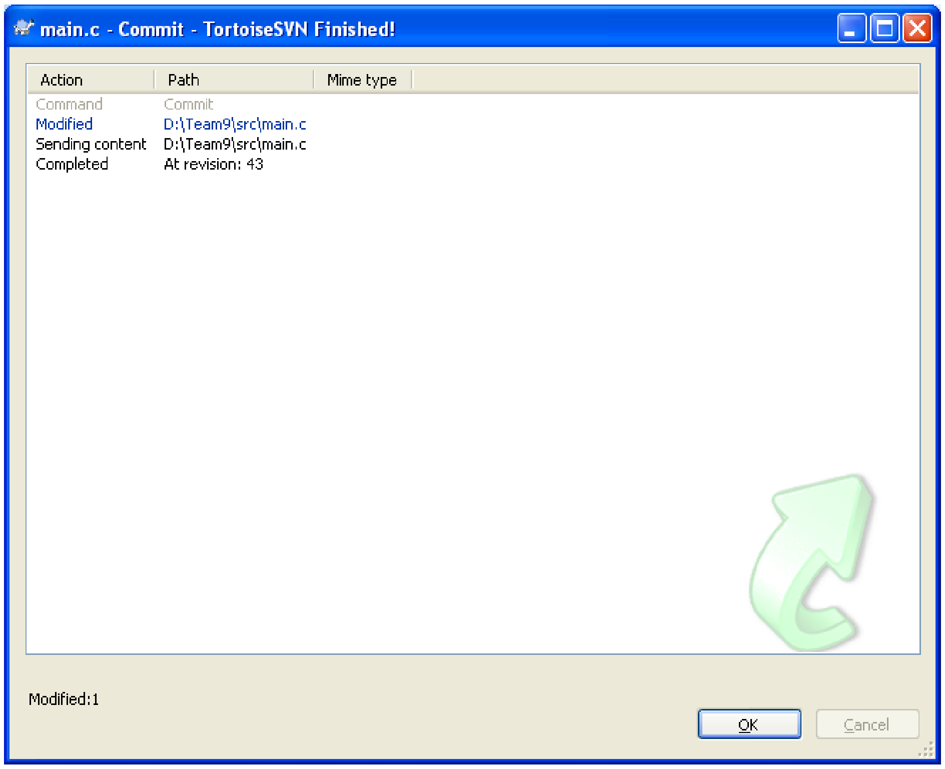
```
Added start and end printf's in main.c
```

Changes made (double-click on file for diff):

Path	Extension	Text status	Property statu
✓ main.c	.c	modified	normal

1 files selected, 1 files total

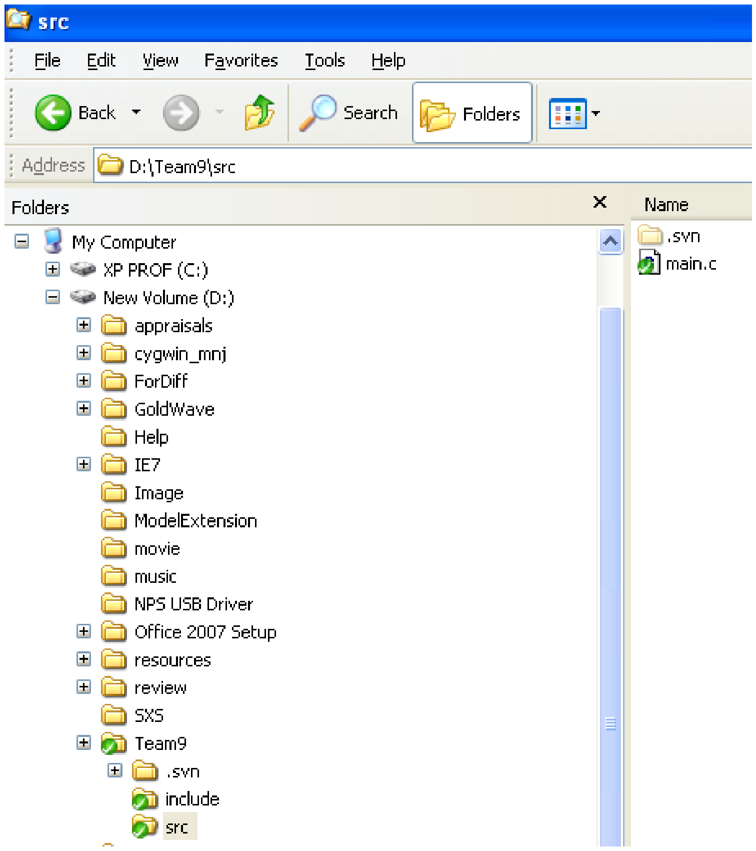
[✓] Show unversioned files
[✓] Select / deselect all
[ ] Keep locks
[ ] Keep changelists



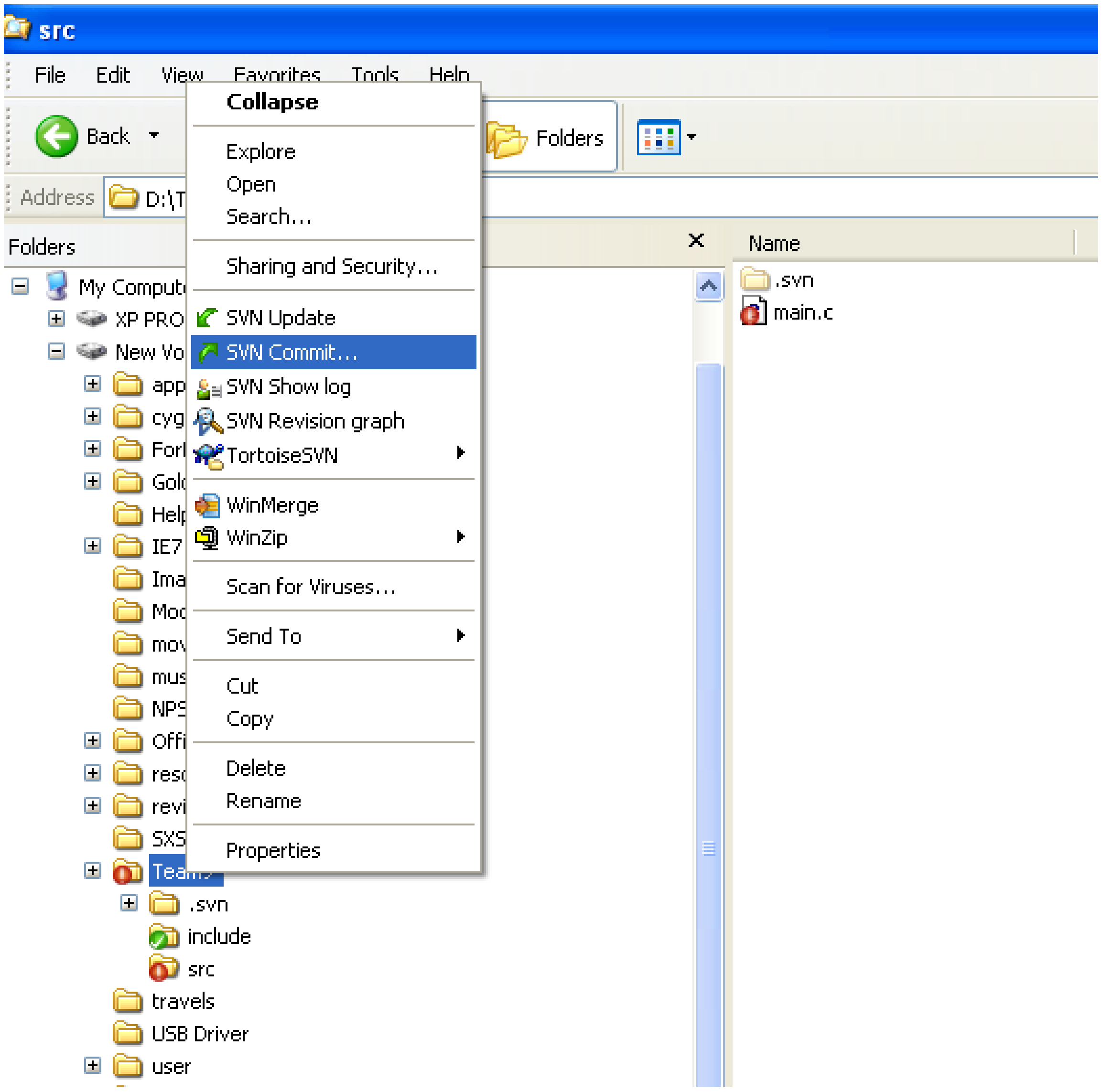
Action	Path	Mime type
Command	Commit	
Modified	D:\Team9\src\main.c	
Sending content	D:\Team9\src\main.c	
Completed	At revision: 43	

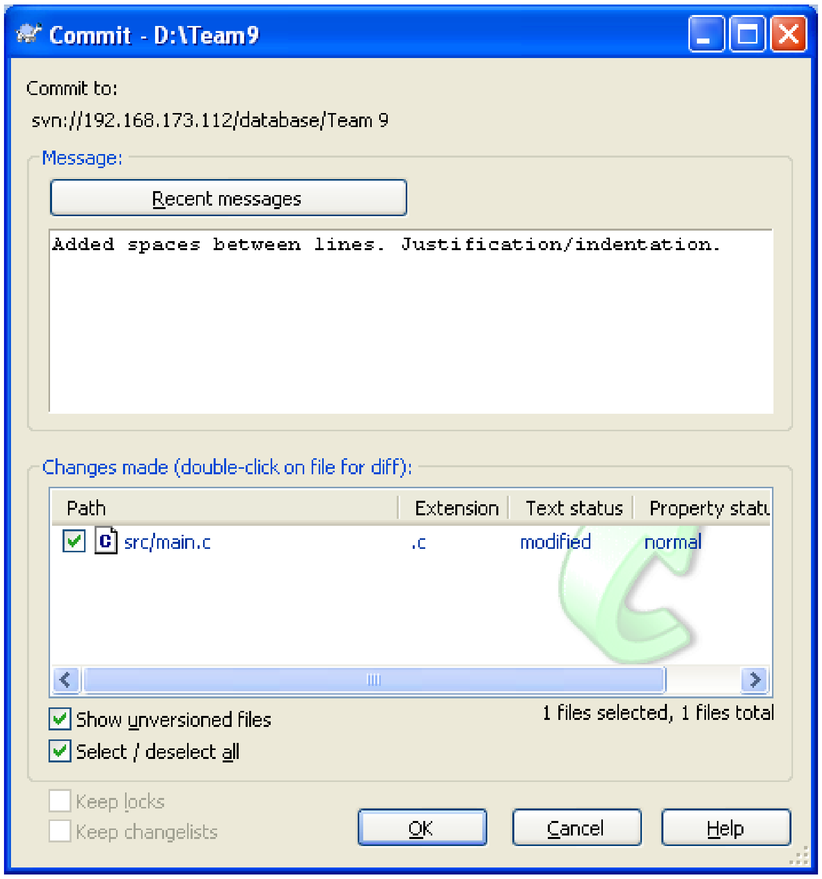
Modified:1

- A new version of main.c is created in the SVN repository and our working directory again shows green-tick icons.



- The above commit could also have been done by doing a right-click on the “Type9” folder in our working directory and selecting “SVN Commit…” as shown in the below snapshots. (This would try to commit all the changed files within our working directory)



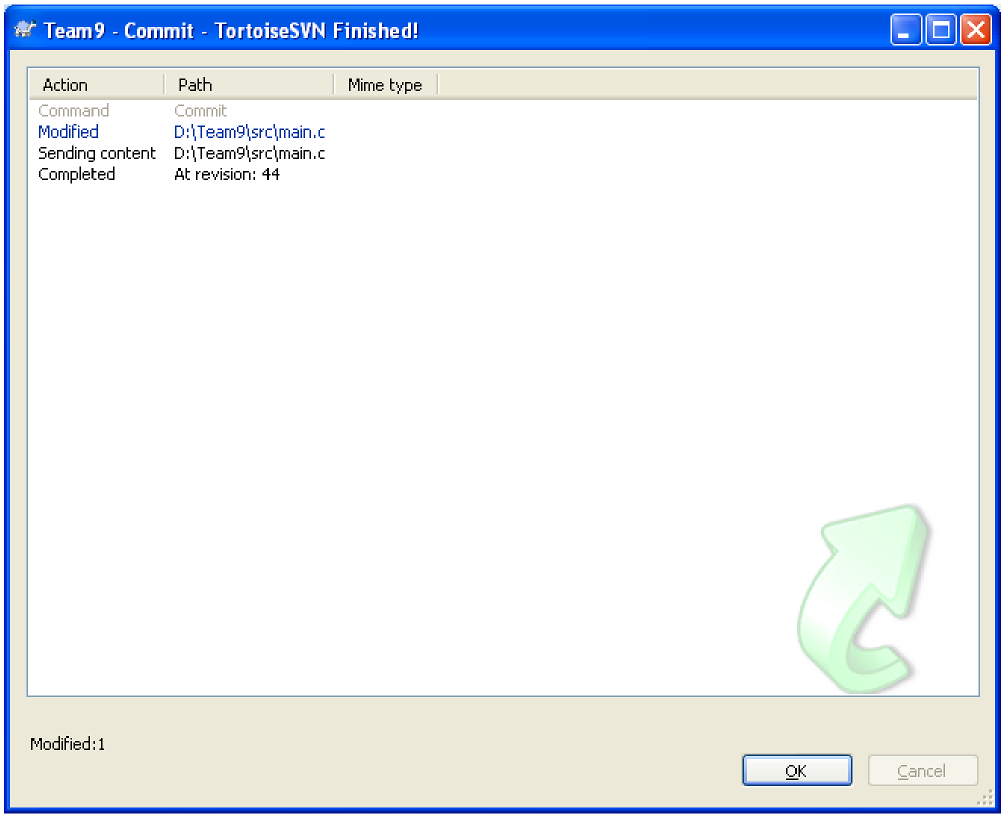


Commit to:
svn://192.168.173.112/database/Team 9

```
Added spaces between lines. Justification/indentation.
```

Path	Extension	Text status	Property statu
✓ src/main.c	.c	modified	normal

Show unversioned files [✓]
Select / deselect all [✓]
1 files selected, 1 files total
Keep locks [ ]
Keep changelists [ ]

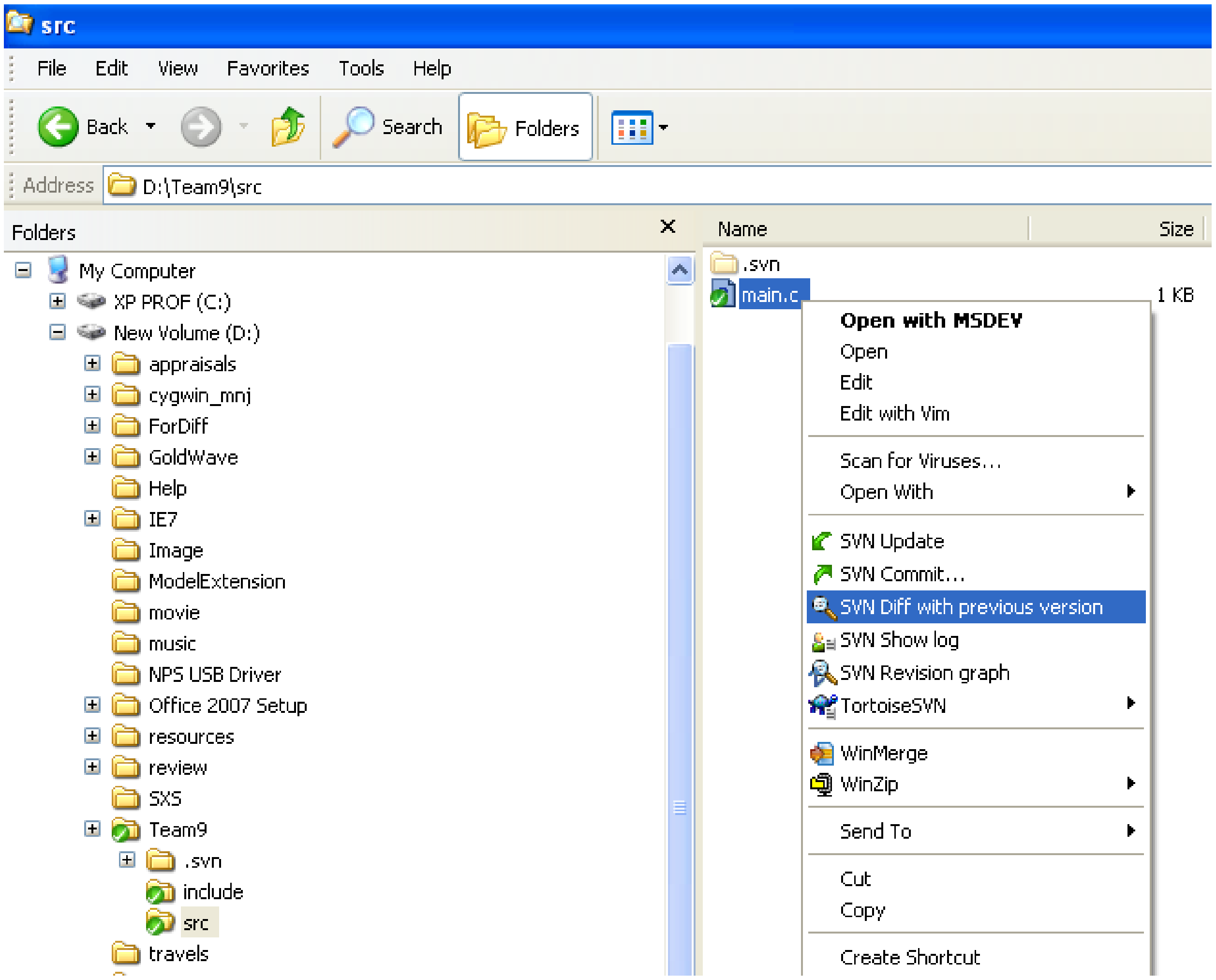


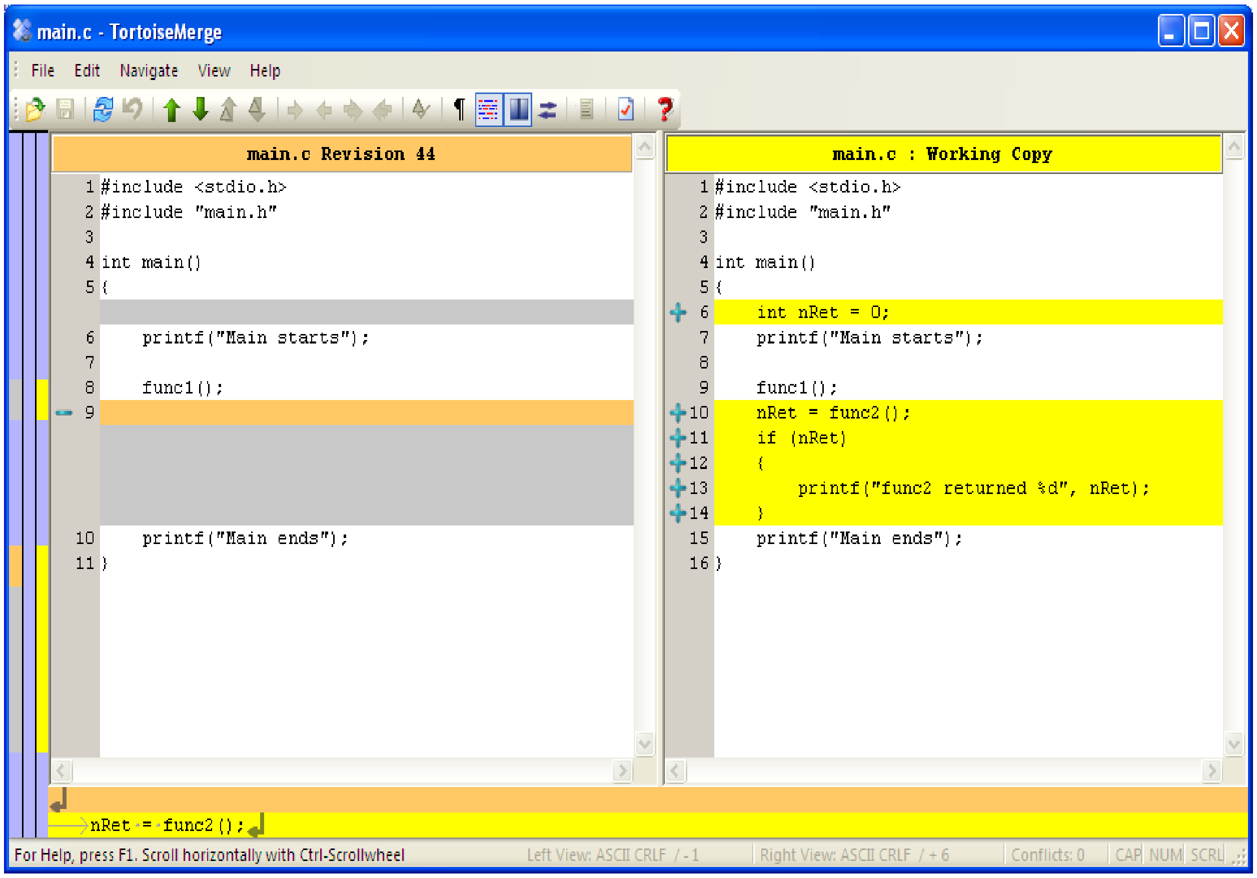
Action	Path	Mime type
Command	Commit	
Modified	D:\Team9\src\main.c	
Sending content	D:\Team9\src\main.c	
Completed	At revision: 44	

Modified:1

Additional Info: Perform a 'Diff' between current and previous version

- You could right-click on any file in your working directory and select the option "SVN Diff with previous version" to see the changes between the last two versions of the file in the SVN repository. (In the below example the last two versions of main.c in the SVN repository are 44 and 45)





main.c Revision 44

```
#include <stdio.h>
#include "main.h"

int main()
{

    printf("Main starts");

    func1();



    printf("Main ends");
}
```

main.c : Working Copy

```
#include <stdio.h>
#include "main.h"

int main()
{
    int nRet = 0;
    printf("Main starts");

    func1();
    nRet = func2();
    if (nRet)
    {
        printf("func2 returned %d", nRet);
    }
    printf("Main ends");
}
```

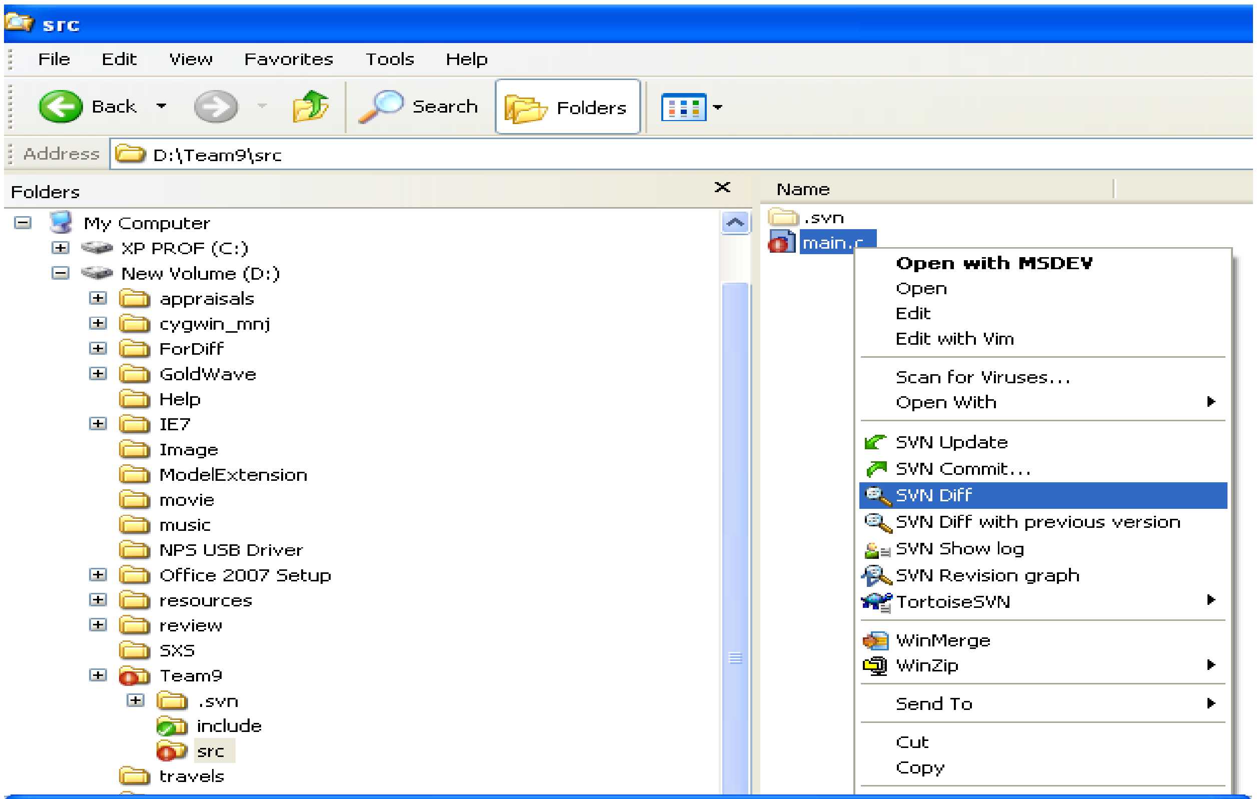
```
nRet = func2();
```

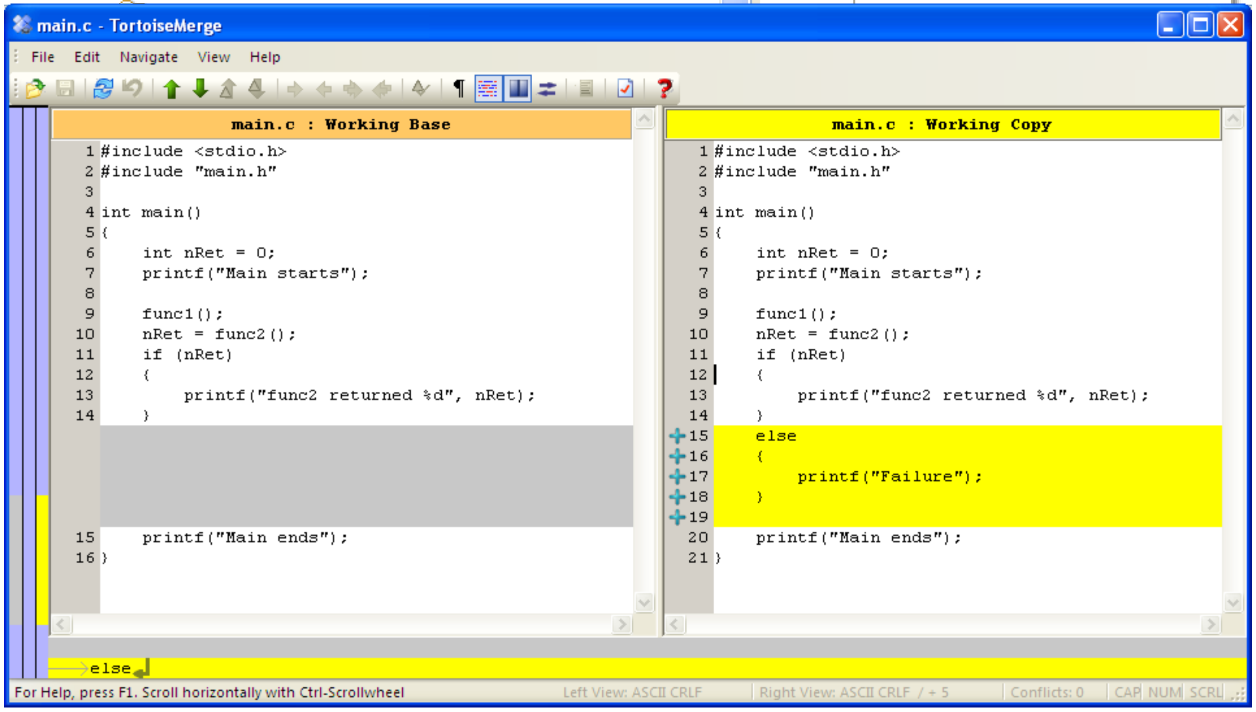
For Help, press F1. Scroll horizontally with Ctrl-Scrollwheel   Left View: ASCII CRLF / - 1   Right View: ASCII CRLF / + 6   Conflicts: 0   CAP NUM SCRL

NOTE: If you right-click on a file that has been changed in your working directory (i.e. is not matching the latest version in the SVN repository), then you would see two 'diff' menu options in the context menu-

- o "SVN Diff" and "SVN Diff with previous version".

- By selecting the option "SVN Diff" you could see the changes between the current working directory version (i.e. the changed local copy of the file) and the latest versions of the file in the SVN repository.




main.c - TortoiseMerge
File Edit Navigate View Help
main.c : Working Base
main.c : Working Copy
else
For Help, press F1. Scroll horizontally with Ctrl-Scrollwheel
Left View: ASCII CRLF
Right View: ASCII CRLF / + 5
Conflicts: 0
CAP NUM SCRL

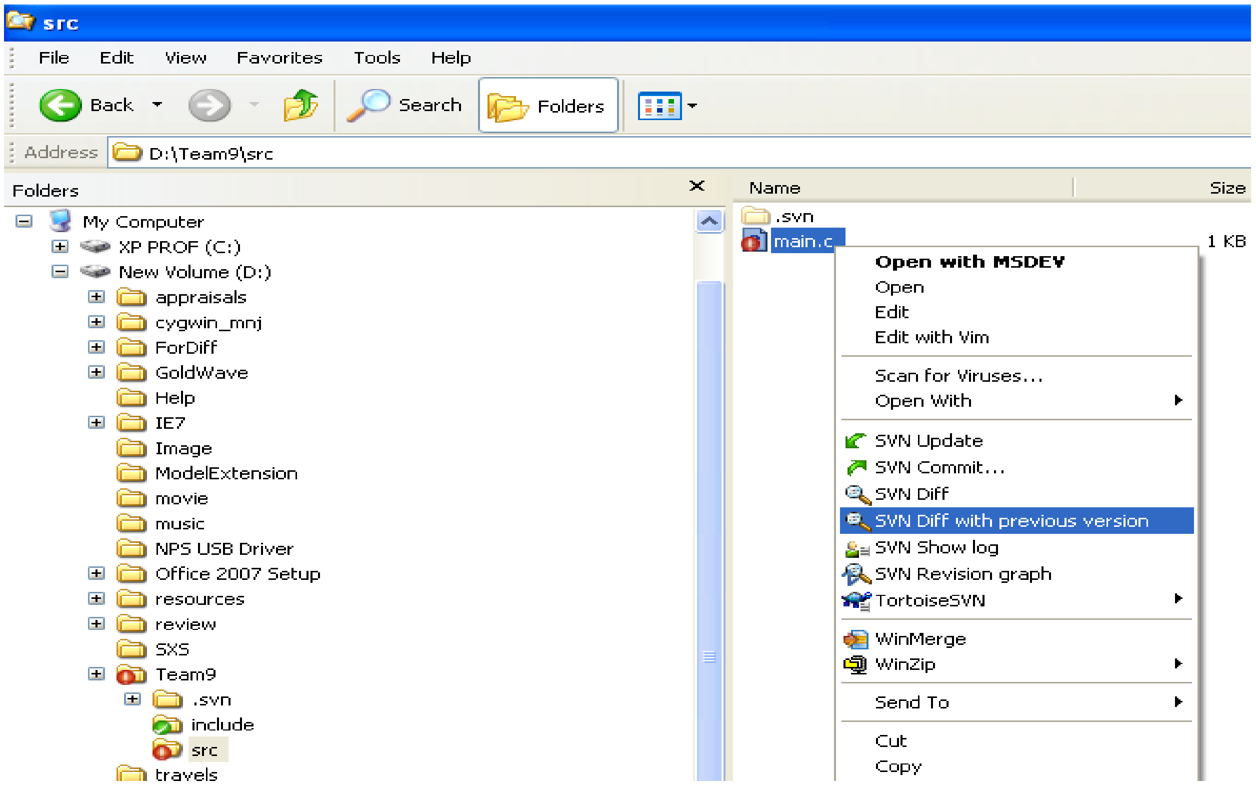
main.c : Working Base

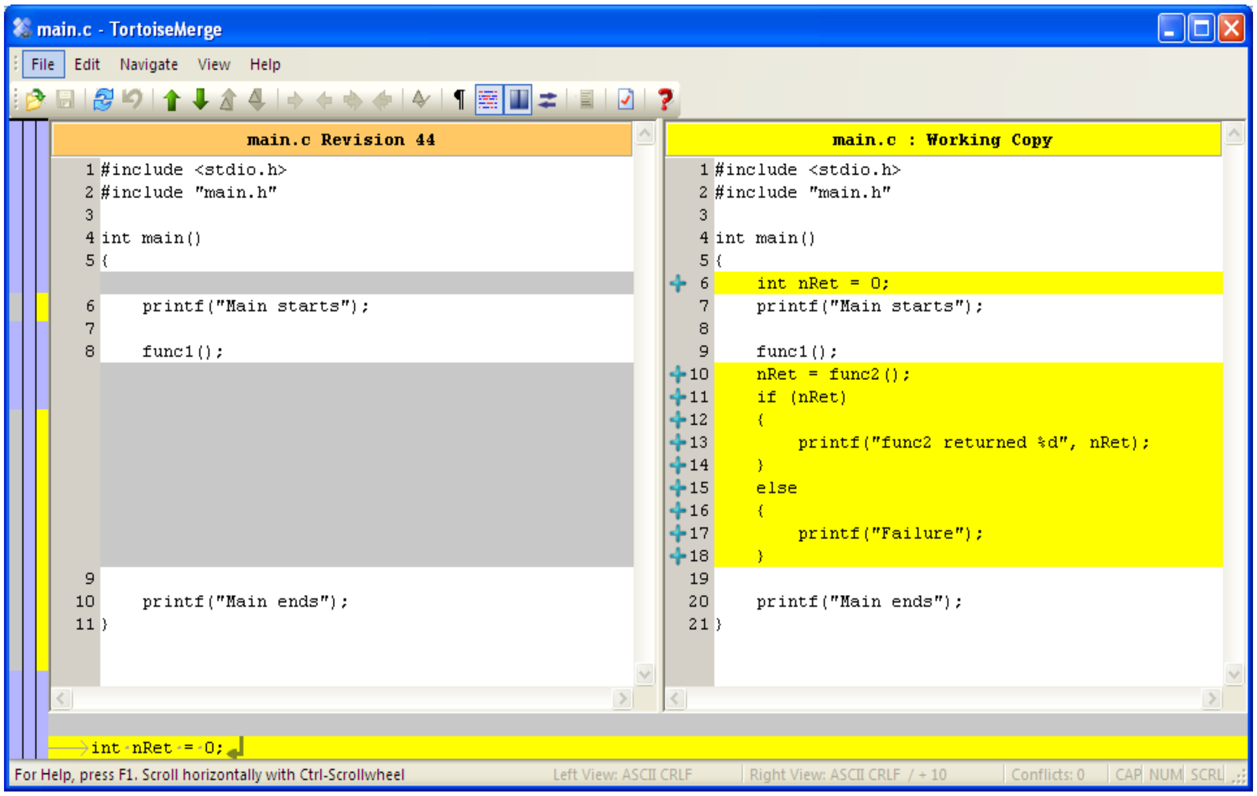
```
#include <stdio.h>
#include "main.h"

int main()
{
    int nRet = 0;
    printf("Main starts");

    func1();
    nRet = func2();
    if (nRet)
    {
        printf("func2 returned %d", nRet);
    }
    printf("Main ends");
}
```

main.c : Working Copy

```
#include <stdio.h>
#include "main.h"

int main()
{
    int nRet = 0;
    printf("Main starts");

    func1();
    nRet = func2();
    if (nRet)
    {
        printf("func2 returned %d", nRet);
    }
    else
    {
        printf("Failure");
    }

    printf("Main ends");
}
```

- By selecting the option "SVN Diff with previous version" you could see the changes between the "merged copy of current working directory version and latest version on SVN repository" and the previous version in SVN repository.




main.c - TortoiseMerge
File Edit Navigate View Help

main.c Revision 44

```
#include <stdio.h>
#include "main.h"

int main()
{

    printf("Main starts");

    func1();

    printf("Main ends");
}
```

main.c : Working Copy

```
#include <stdio.h>
#include "main.h"

int main()
{
    int nRet = 0;
    printf("Main starts");

    func1();
    nRet = func2();
    if (nRet)
    {
        printf("func2 returned %d", nRet);
    }
    else
    {
        printf("Failure");
    }

    printf("Main ends");
}
```

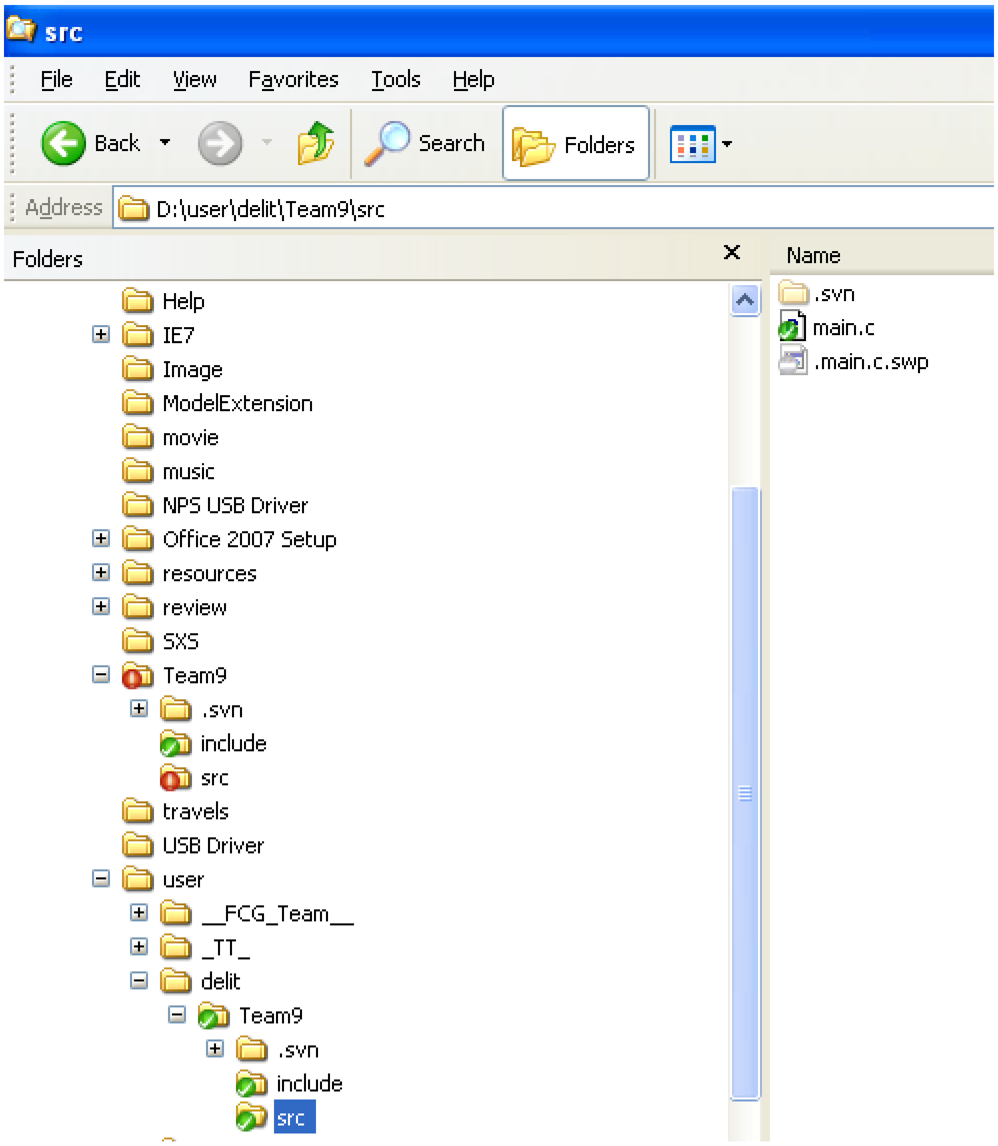
```
int nRet = 0;
```

For Help, press F1. Scroll horizontally with Ctrl-Scrollwheel
Left View: ASCII CRLF
Right View: ASCII CRLF / + 10
Conflicts: 0
CAP NUM SCRL

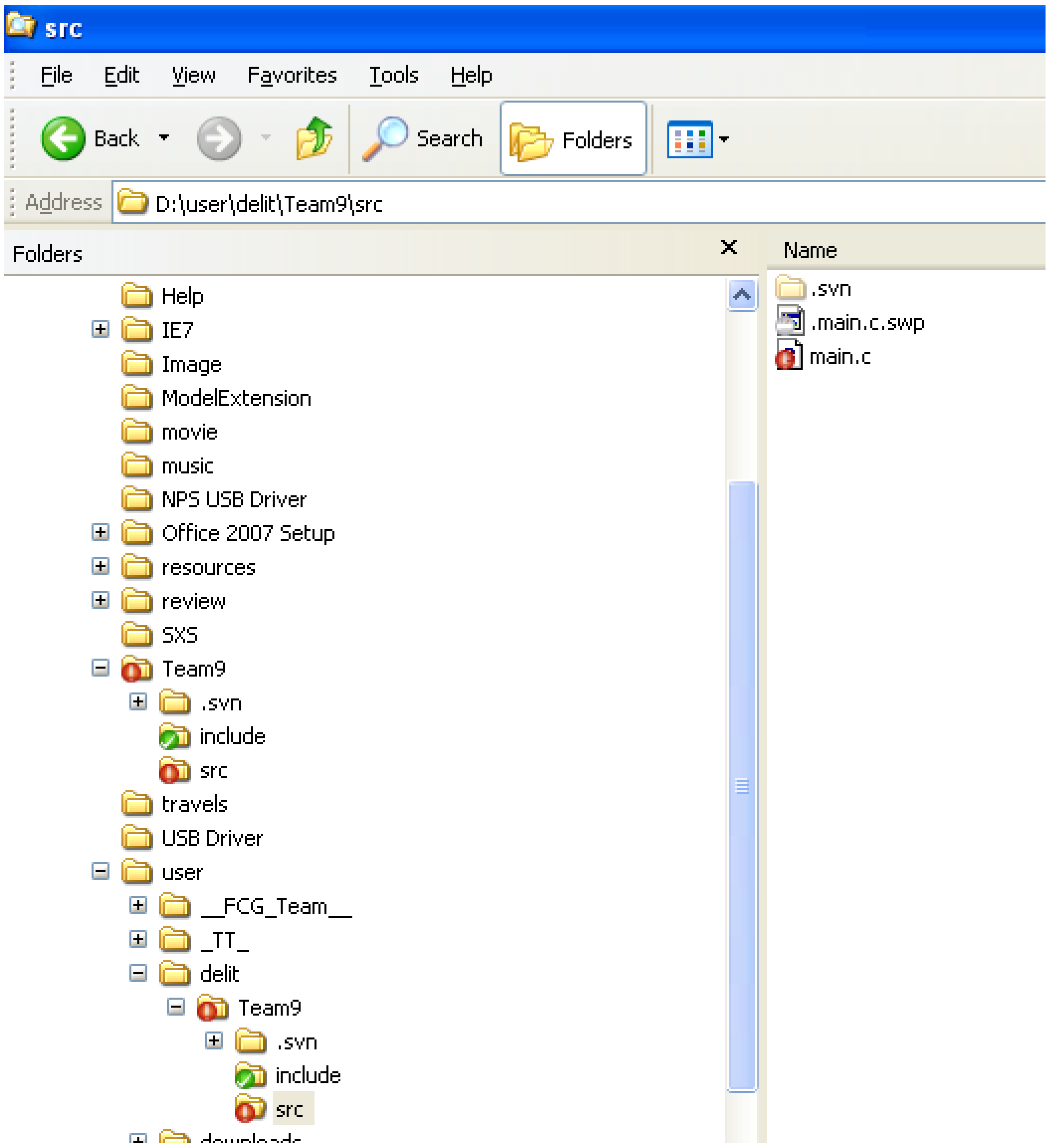
Additional Info: How to resolve conflicts?

A conflict occurs when two or more people try to change the same file. The first person to commit his/her changes does not face any issue, but when the remaining people commit their changes, the SVN repository would not allow the check-in and would suggest the person to resolve the conflict.

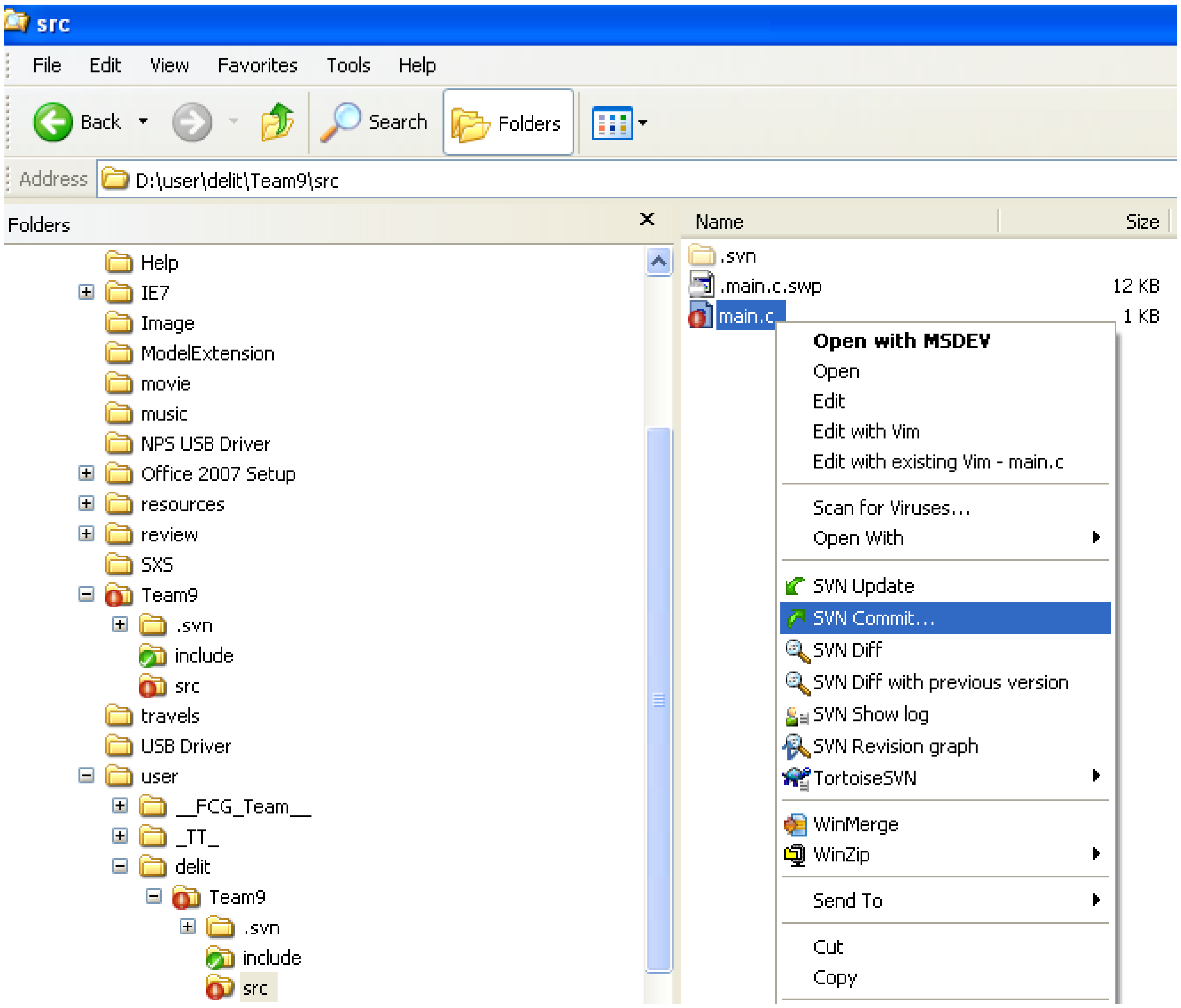
Let us see a scenario where two people try to change the same file. Assume that two users have checked-out the same file. For e.g. -
user1 has checked out the “Team 9” folder (from SVN repository) to “D:\Team9” folder
user2 has checked out the “Team 9” folder (from SVN repository) to “D:\user\delit\Team9” folder

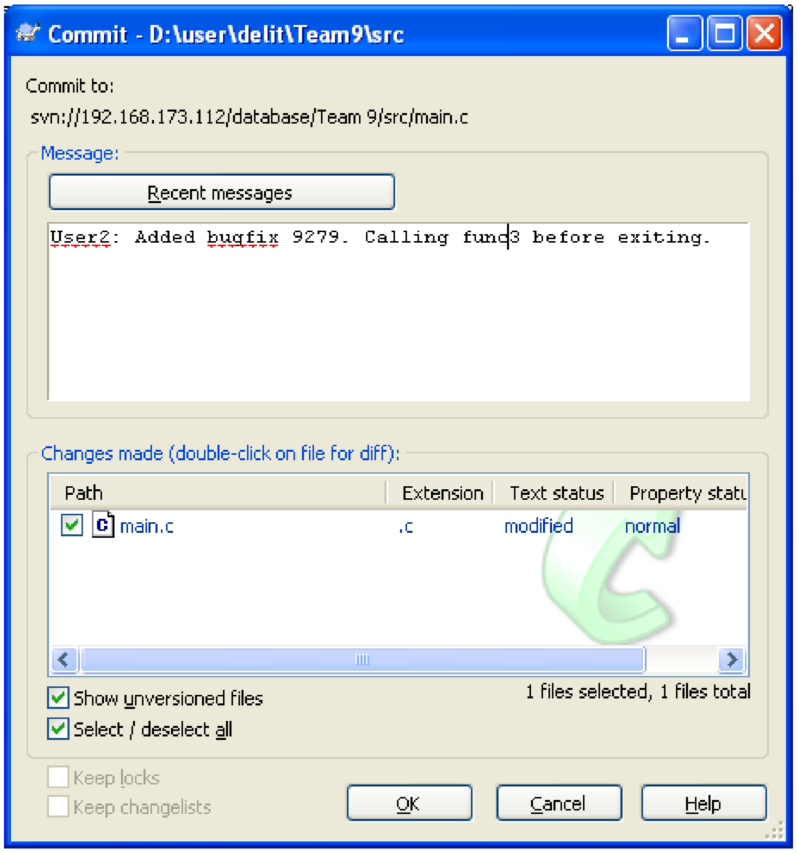


Both user1 and user2 have made changes to their copies of main.c –



Assume that user2 commits his/her changes first –





Commit - D:\user\delit\Team9\src

Commit to:
svn://192.168.173.112/database/Team 9/src/main.c

Message:

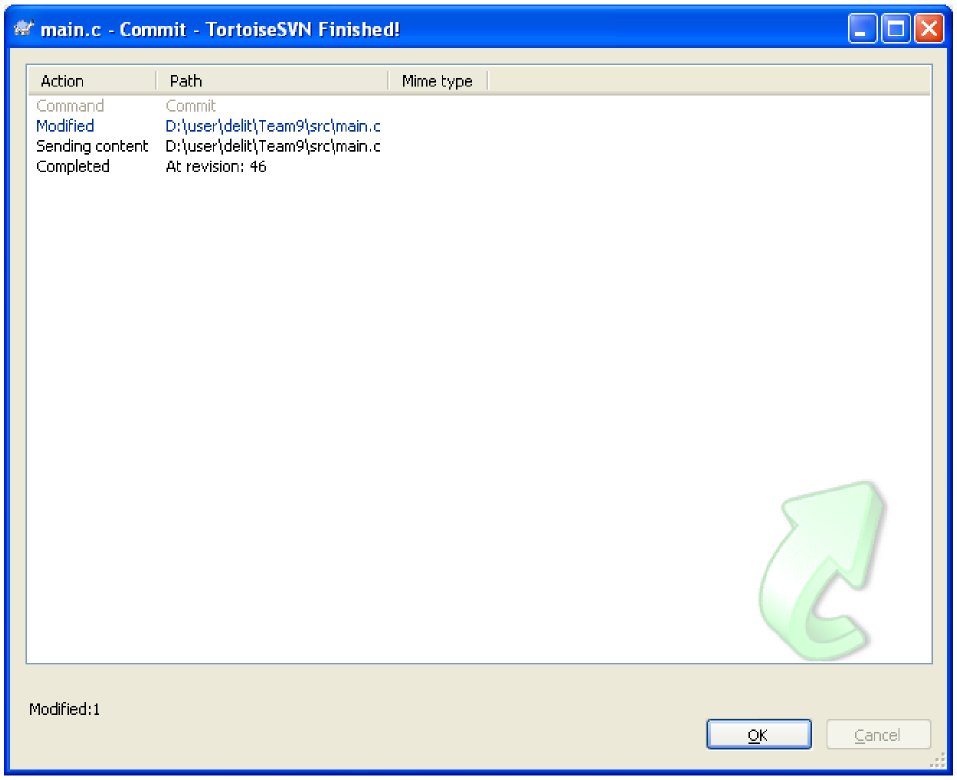
```
User2: Added bugfix 9279. Calling func3 before exiting.
```

Changes made (double-click on file for diff):

Path	Extension	Text status	Property statu
✓ main.c	.c	modified	normal

1 files selected, 1 files total

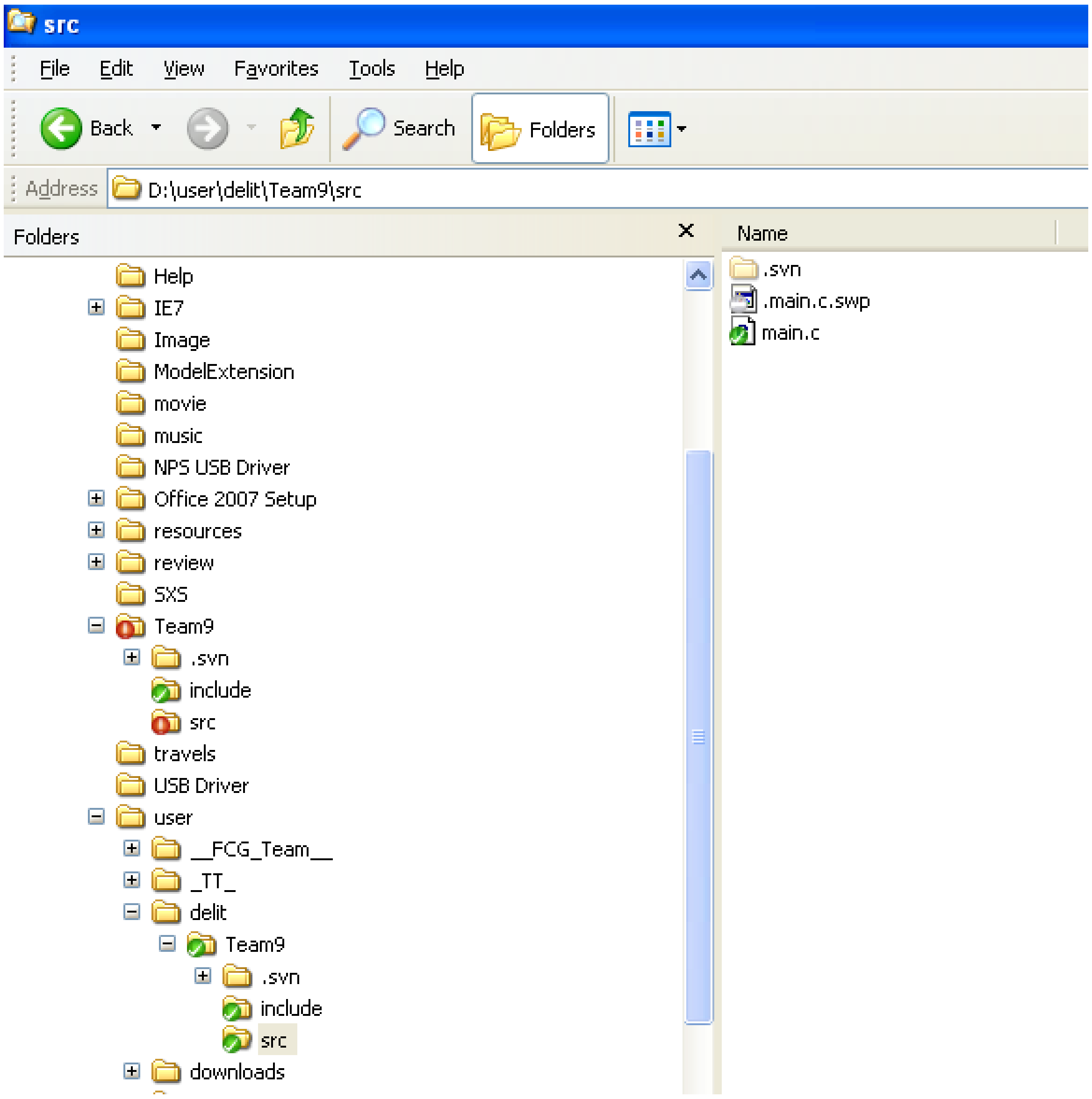
☑ Show unversioned files
☑ Select / deselect all
☐ Keep locks
☐ Keep changelists



main.c - Commit - TortoiseSVN Finished!

```
Action           Path                             Mime type
Command          Commit
Modified         D:\user\delit\Team9\src\main.c
Sending content  D:\user\delit\Team9\src\main.c
Completed        At revision: 46
```

Modified:1

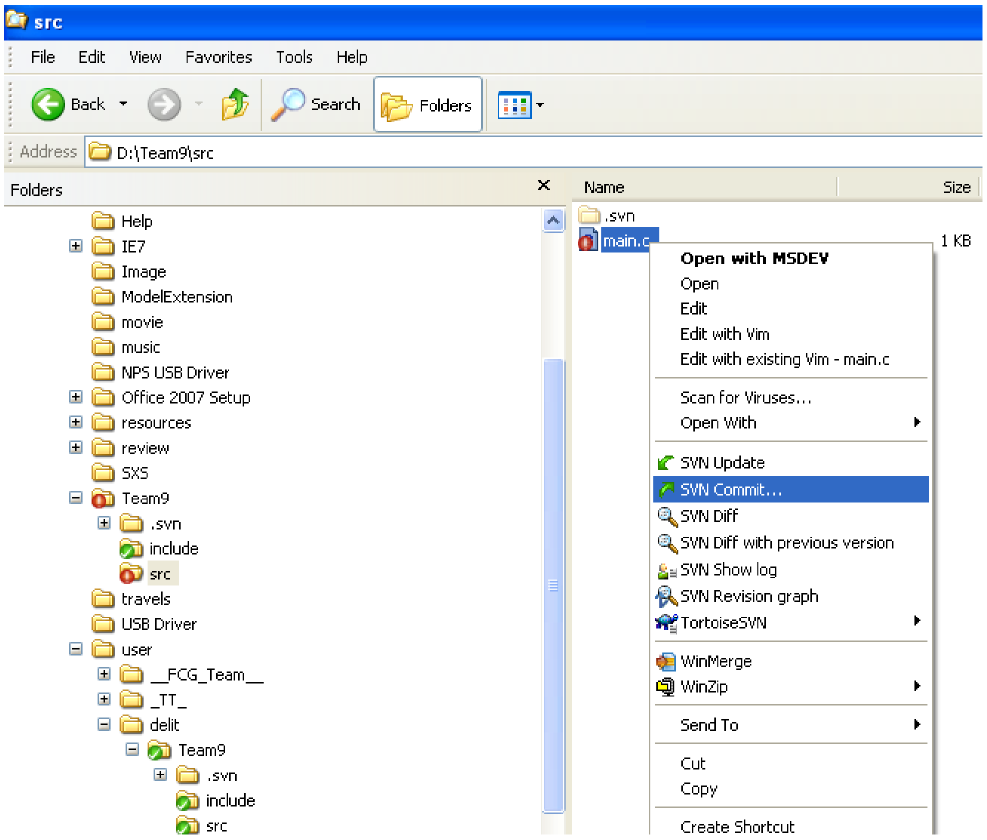


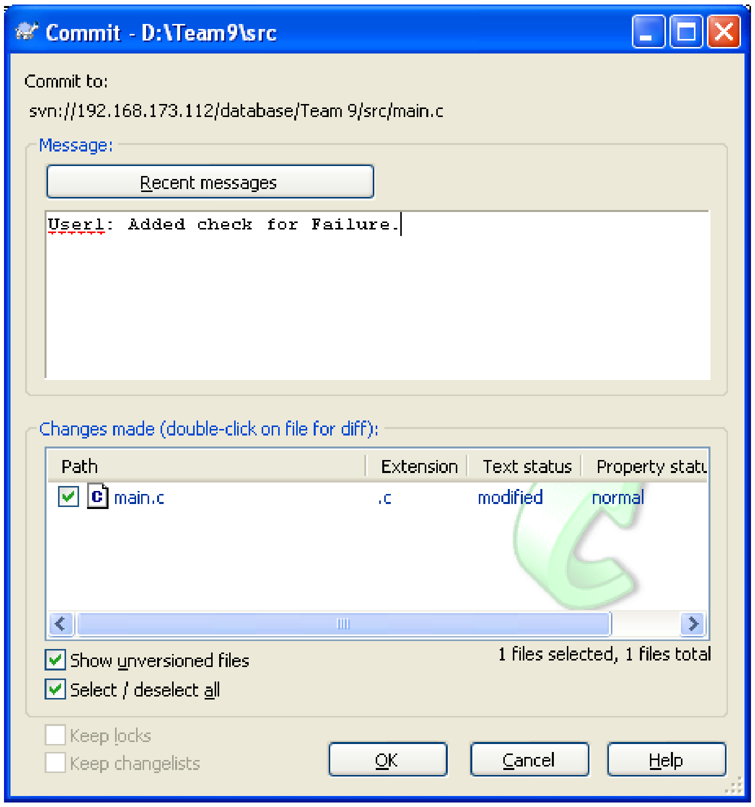
D:\user\delit\Team9\src

Help
IE7
Image
ModelExtension
movie
music
NPS USB Driver
Office 2007 Setup
resources
review
SXS
Team9
.svn
include
src
travels
USB Driver
user
__FCG_Team__
_TT_
delit
Team9
.svn
include
src
downloads

.svn
.main.c.swp
main.c

Now let us we try to commit User1's changes.




Commit - D:\Team9\src

Commit to:
svn://192.168.173.112/database/Team 9/src/main.c

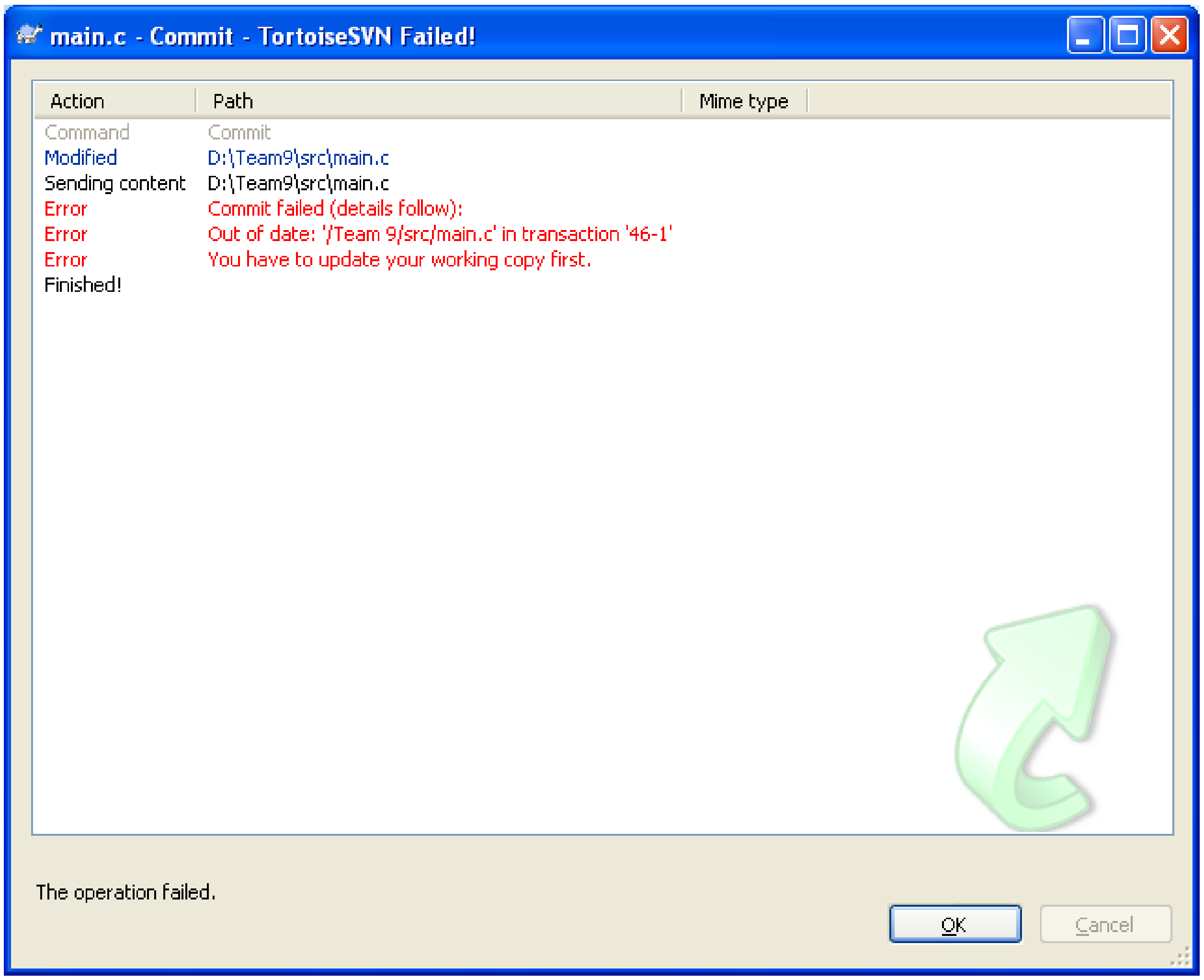
Message:

User1: Added check for Failure.

Changes made (double-click on file for diff):

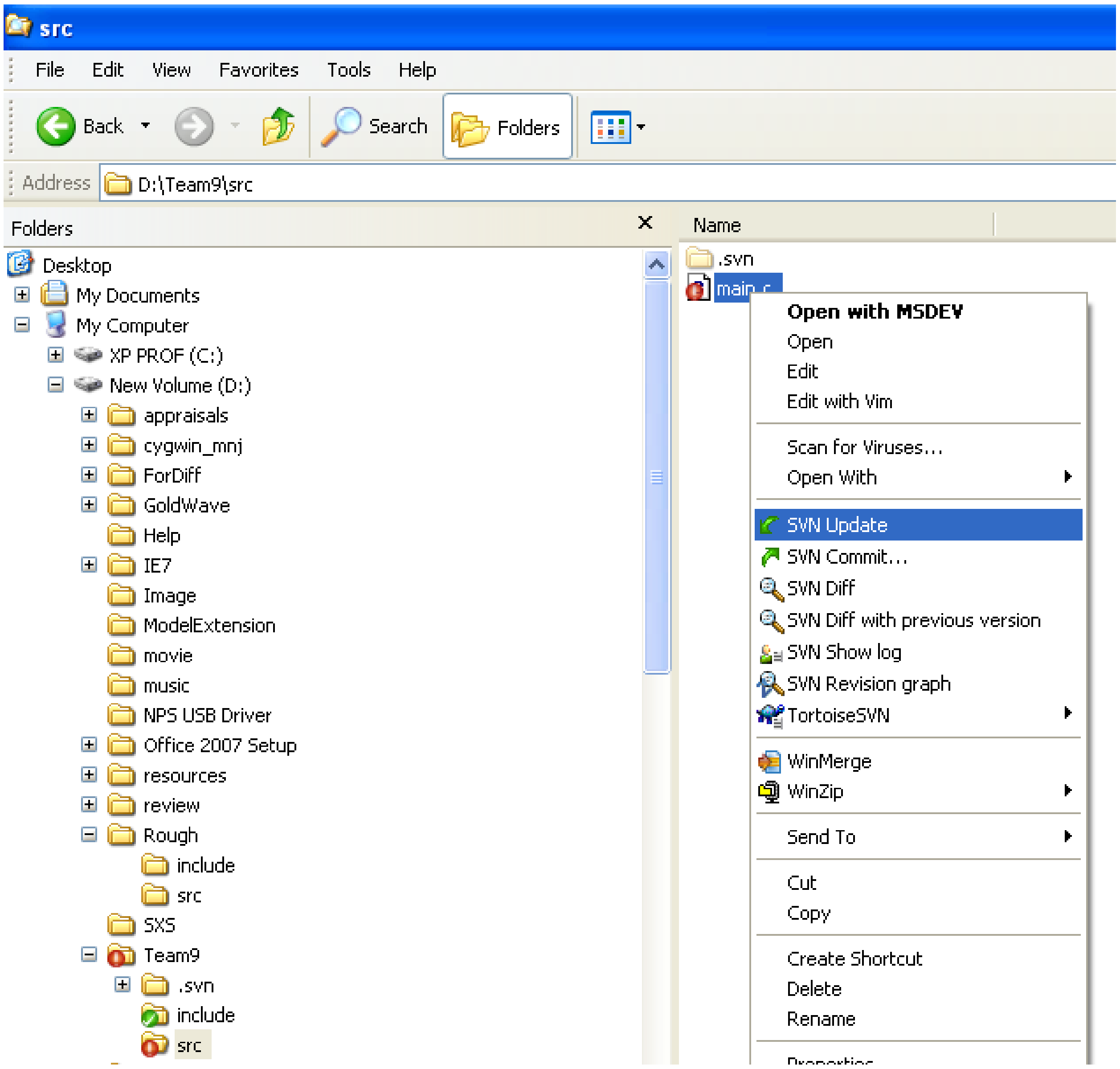
Path	Extension	Text status	Property statu
✓ main.c	.c	modified	normal

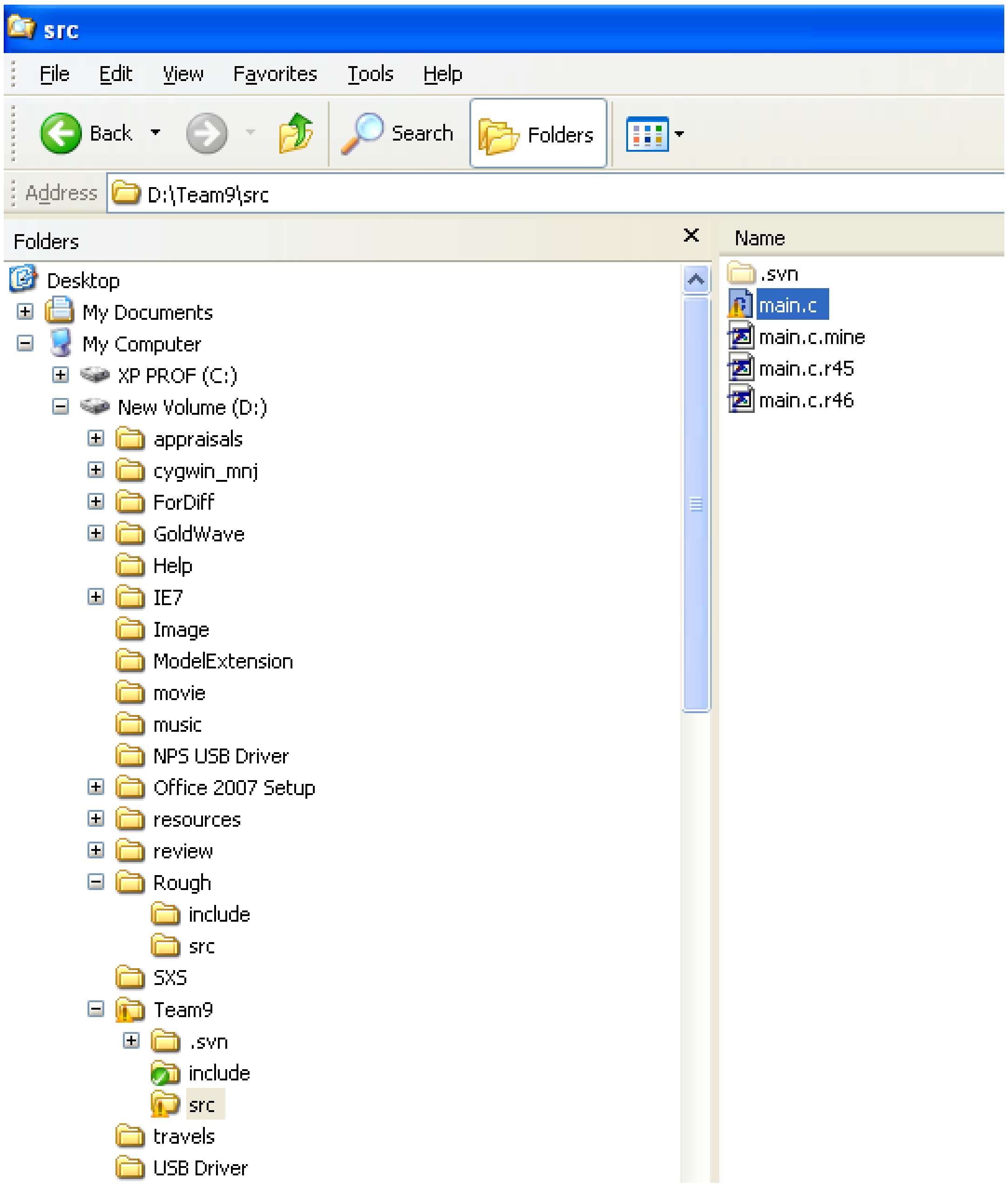
1 files selected, 1 files total



```
Action            Path                                                    Mime type
Command           Commit
Modified          D:\Team9\src\main.c
Sending content   D:\Team9\src\main.c
Error             Commit failed (details follow):
Error             Out of date: '/Team 9/src/main.c' in transaction '46-1'
Error             You have to update your working copy first.
Finished!

The operation failed.
```

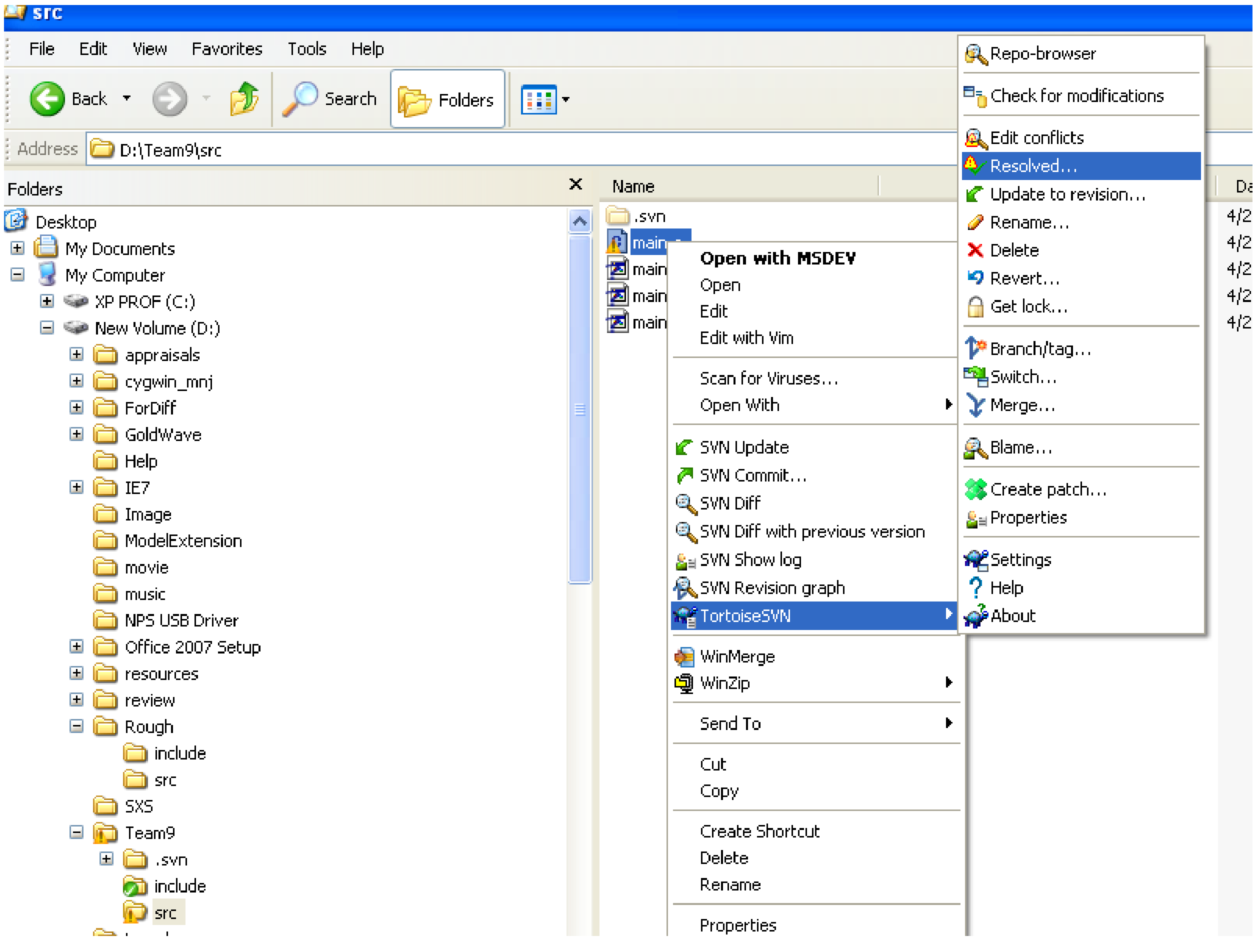
As the error message in the above snapshot explains, the local copy of main.c (in the current working directory) is out of date with the latest version in the repository. It is required is to update the local copy of main.c using the latest version in repository and then incorporate the current local copy changes into main.c. The following snapshots show the steps to do so -

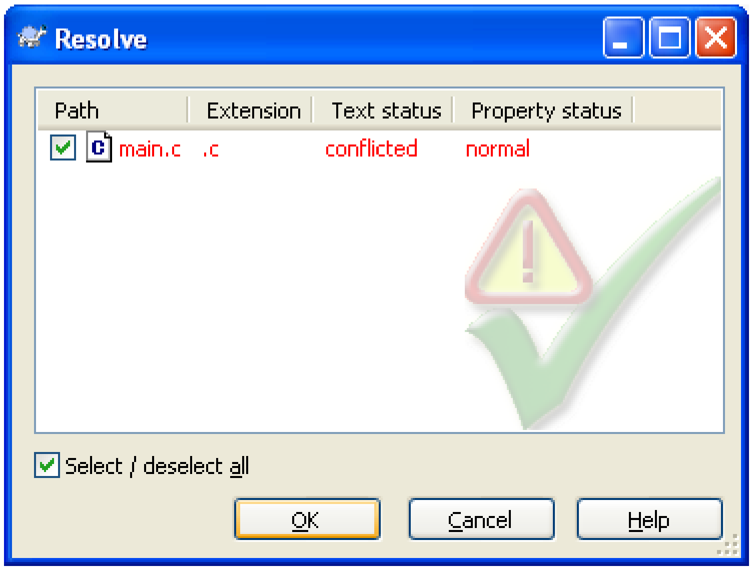

src
File Edit View Favorites Tools Help
Back
Search
Folders
Address D:\Team9\src
Folders
Name
Desktop
My Documents
My Computer
XP PROF (C:)
New Volume (D:)
appraisals
cygwin_mnj
ForDiff
GoldWave
Help
IE7
Image
ModelExtension
movie
music
NPS USB Driver
Office 2007 Setup
resources
review
Rough
include
src
SXS
Team9
.svn
include
src
.svn
main.c
Open with MSDEV
Open
Edit
Edit with Vim
Scan for Viruses...
Open With
SVN Update
SVN Commit...
SVN Diff
SVN Diff with previous version
SVN Show log
SVN Revision graph
TortoiseSVN
WinMerge
WinZip
Send To
Cut
Copy
Create Shortcut
Delete
Rename



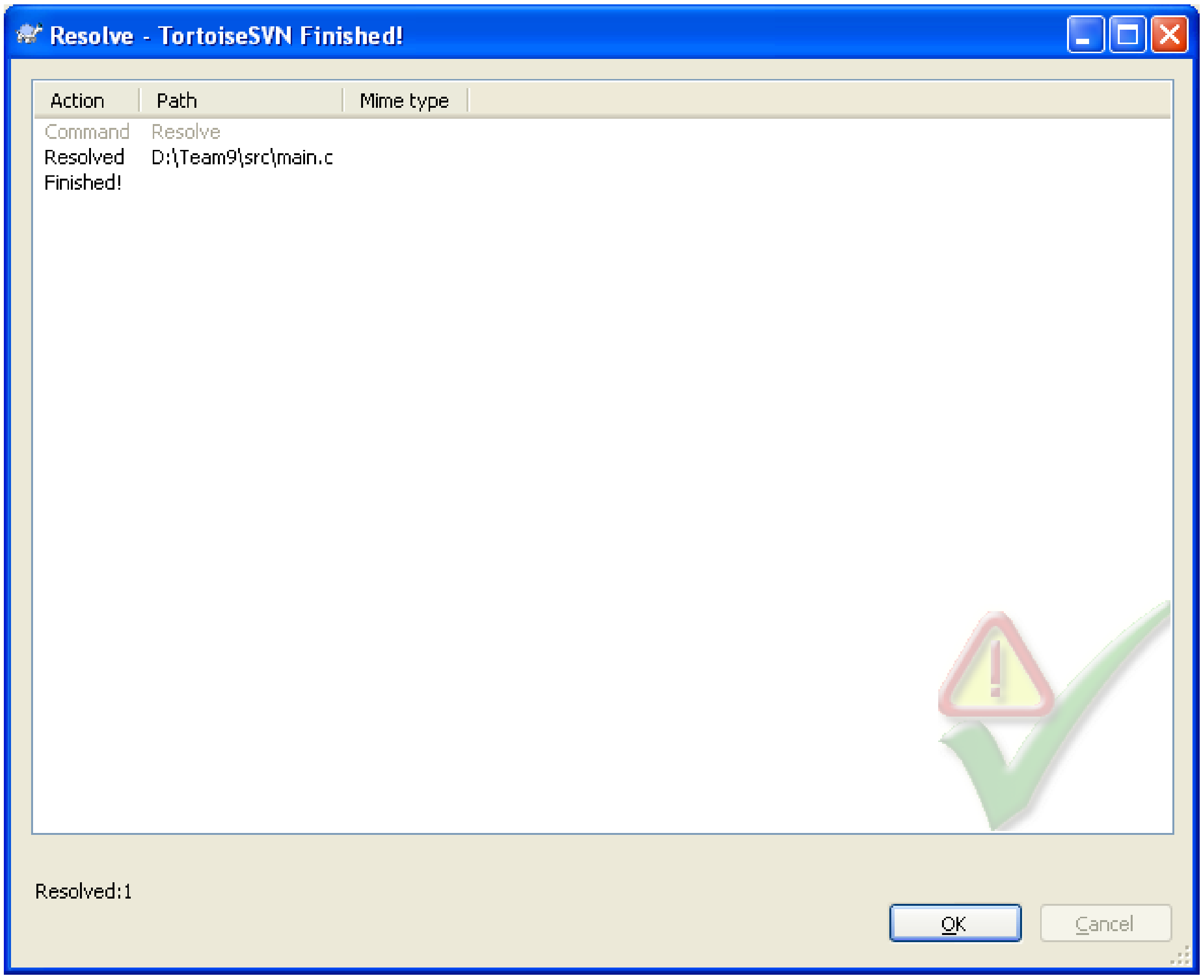
SVN brings in the last two versions (of the conflicting file) from the repository, and also creates a new file names main.c.mine that shows which are the changes that are conflicting.

You must now manually check the conflicting changes, and update our local copy of main.c. Once you are sure that you have incorporated the changes properly into the localcopy of main.c, right-click on the file main.c and select the menu option “TortoiseSVN->Resolved…” as shown in the following snapshot.





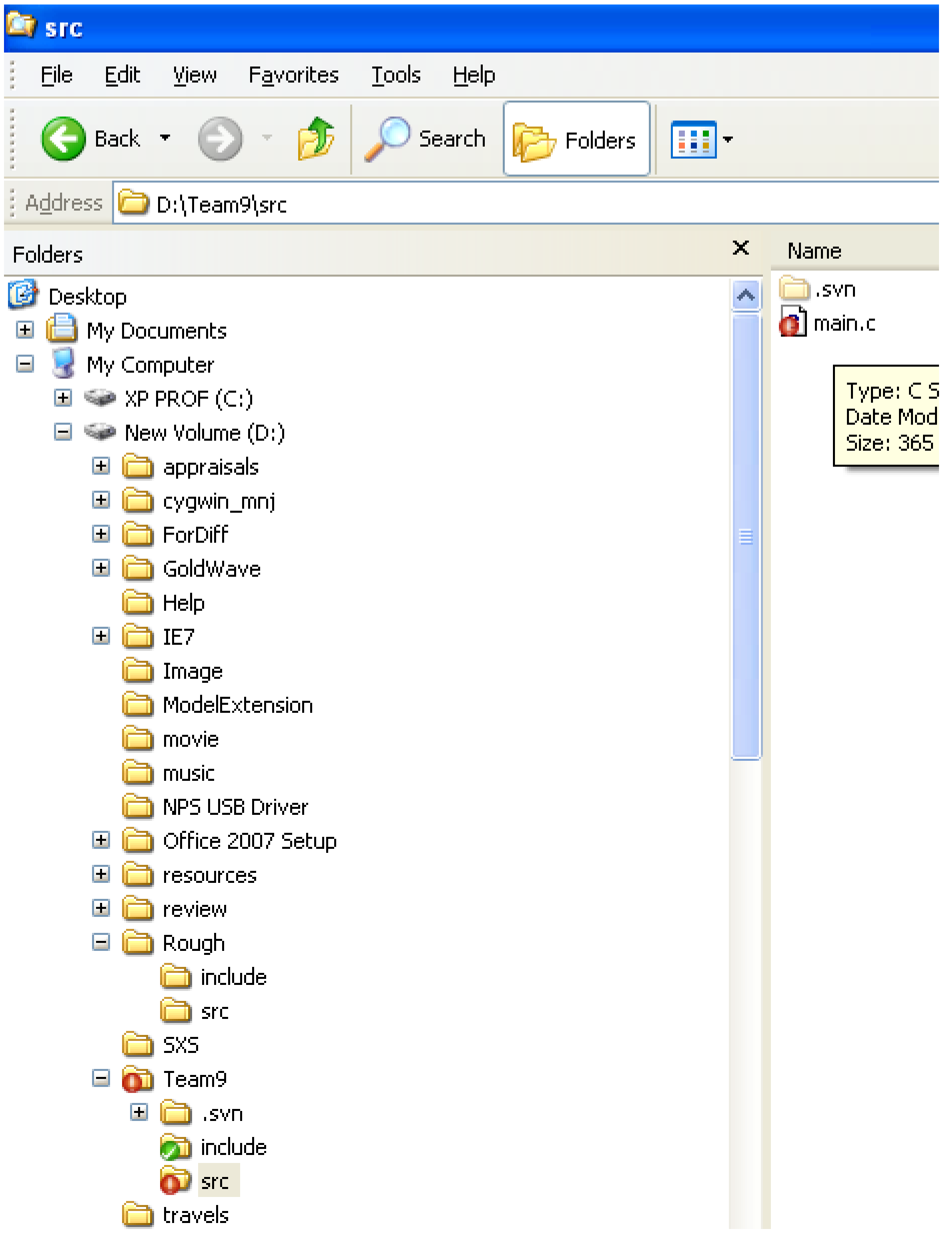
Path	Extension	Text status	Property status
✓ main.c	.c	conflicted	normal



```
Action     Path                Mime type
Command    Resolve
Resolved   D:\Team9\src\main.c
Finished!
```

Resolved:1

You will now notice that the three files main.c.r45, main.c.r46 and main.c.mine have vanished, and main.c is filename shown with the red-exclamation icon denoting that this file is yet to be committed into the repository.

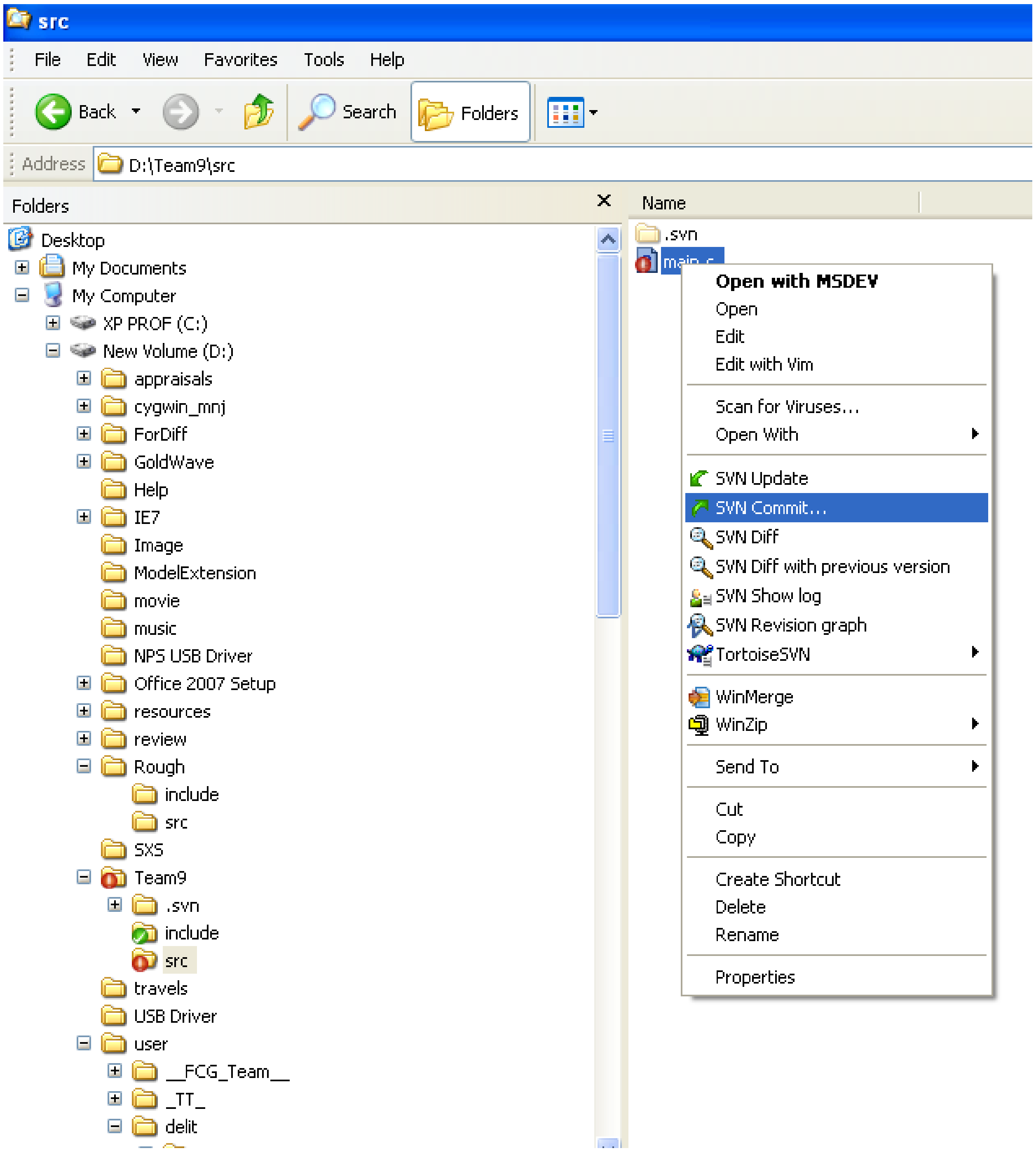


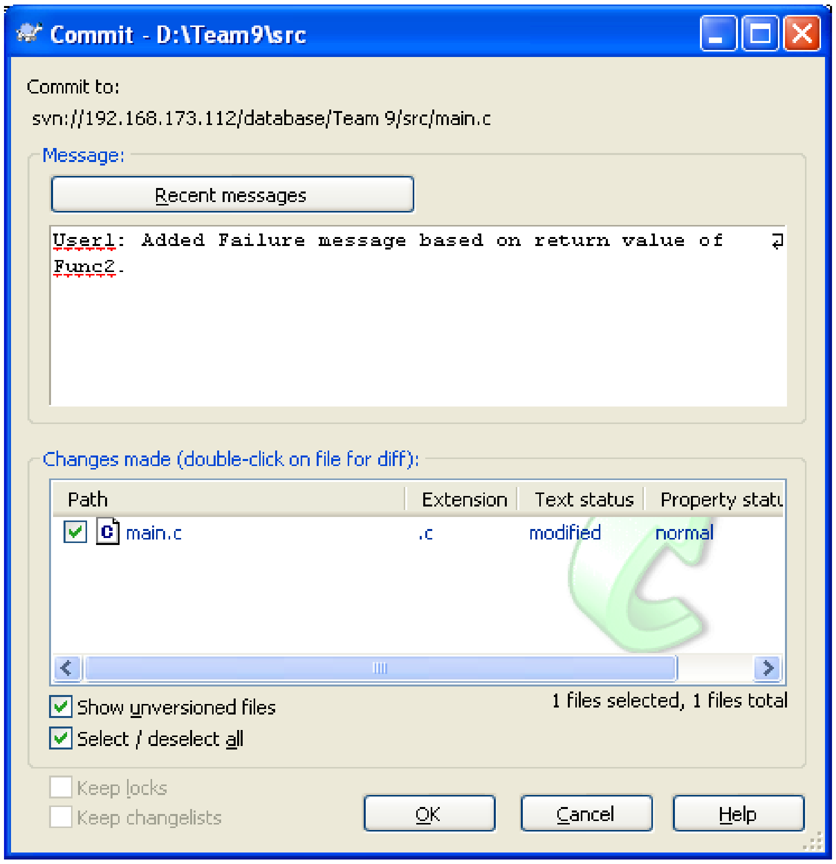
D:\Team9\src

```
Desktop
  My Documents
  My Computer
    XP PROF (C:)
    New Volume (D:)
      appraisals
      cygwin_mnj
      ForDiff
      GoldWave
      Help
      IE7
      Image
      ModelExtension
      movie
      music
      NPS USB Driver
      Office 2007 Setup
      resources
      review
      Rough
        include
        src
      SXS
      Team9
        .svn
        include
        src
      travels
```

```
.svn
main.c
```

```
Type: C S
Date Mod
Size: 365
```


src
File
Edit
View
Favorites
Tools
Help
Back
Search
Folders
Address
D:\Team9\src
Folders
Desktop
My Documents
My Computer
XP PROF (C:)
New Volume (D:)
appraisals
cygwin_mnj
ForDiff
GoldWave
Help
IE7
Image
ModelExtension
movie
music
NPS USB Driver
Office 2007 Setup
resources
review
Rough
include
src
SXS
Team9
.svn
include
src
travels
USB Driver
user
__FCG_Team__
_TT_
delit
Name
.svn
main.c
Open with MSDEV
Open
Edit
Edit with Vim
Scan for Viruses...
Open With
SVN Update
SVN Commit...
SVN Diff
SVN Diff with previous version
SVN Show log
SVN Revision graph
TortoiseSVN
WinMerge
WinZip
Send To
Cut
Copy
Create Shortcut
Delete
Rename
Properties



Commit - D:\Team9\src

Commit to:
svn://192.168.173.112/database/Team 9/src/main.c

Message:

Recent messages

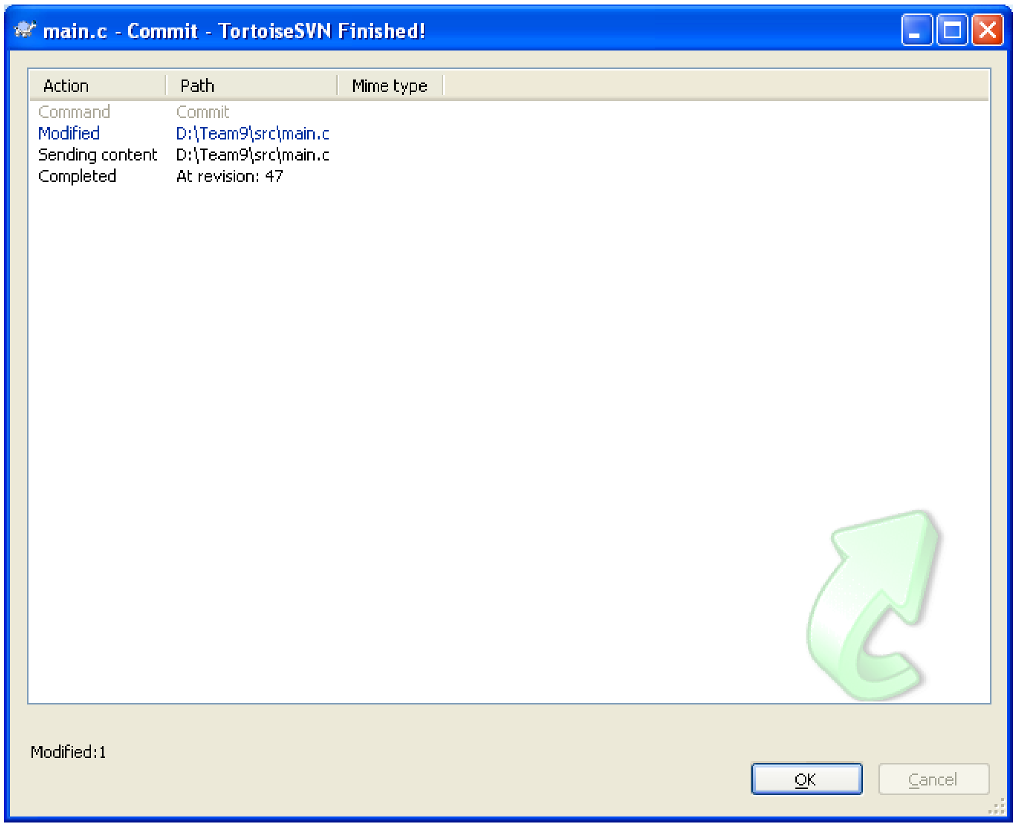
```
User1: Added Failure message based on return value of
Func2.
```

Changes made (double-click on file for diff):

Path	Extension	Text status	Property statu
✓ main.c	.c	modified	normal

1 files selected, 1 files total

✓ Show unversioned files
✓ Select / deselect all
Keep locks
Keep changelists

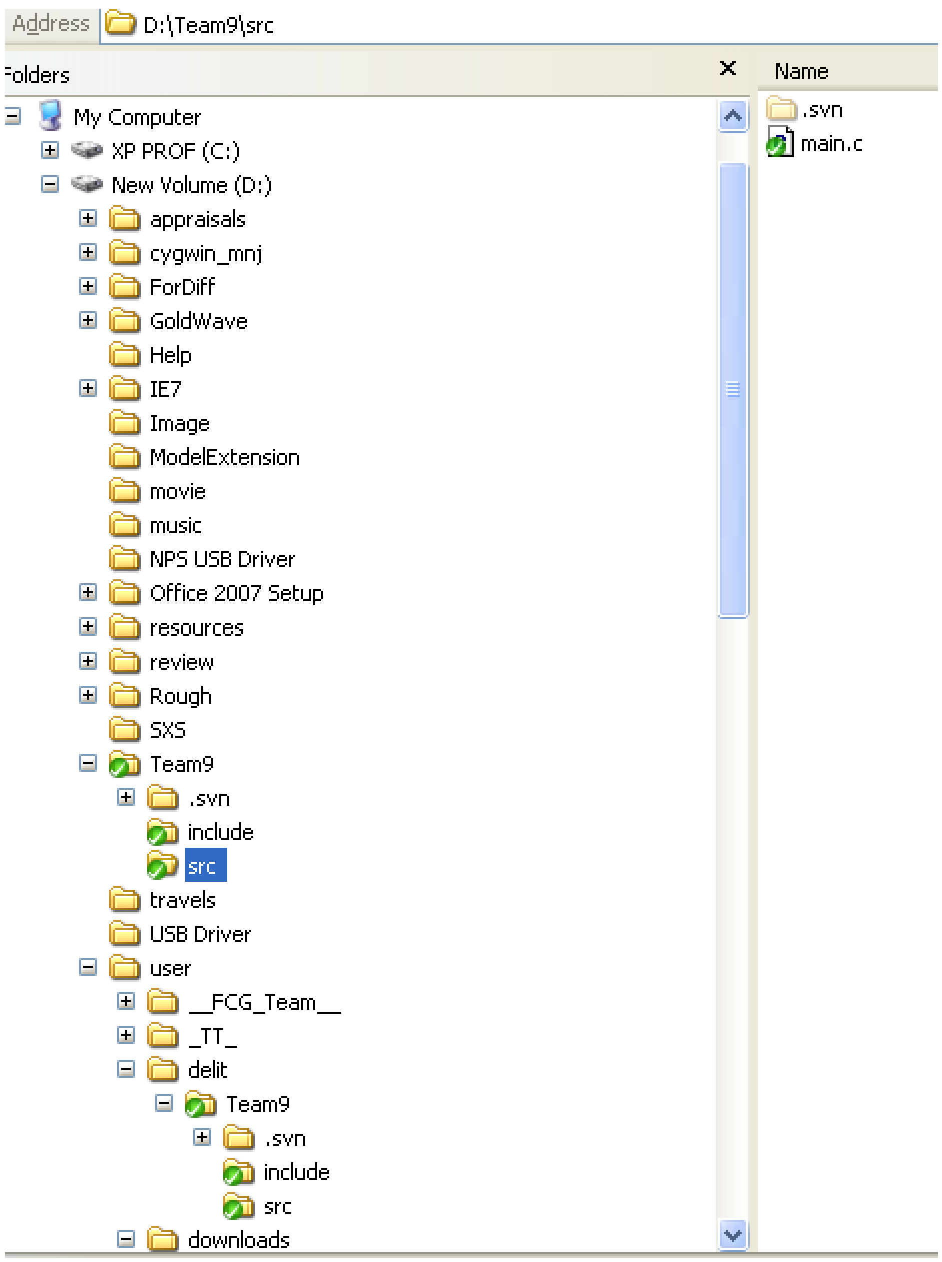


main.c - Commit - TortoiseSVN Finished!

```
Action           Path                    Mime type
Command          Commit
Modified         D:\Team9\src\main.c
Sending content  D:\Team9\src\main.c
Completed        At revision: 47
```

Modified:1

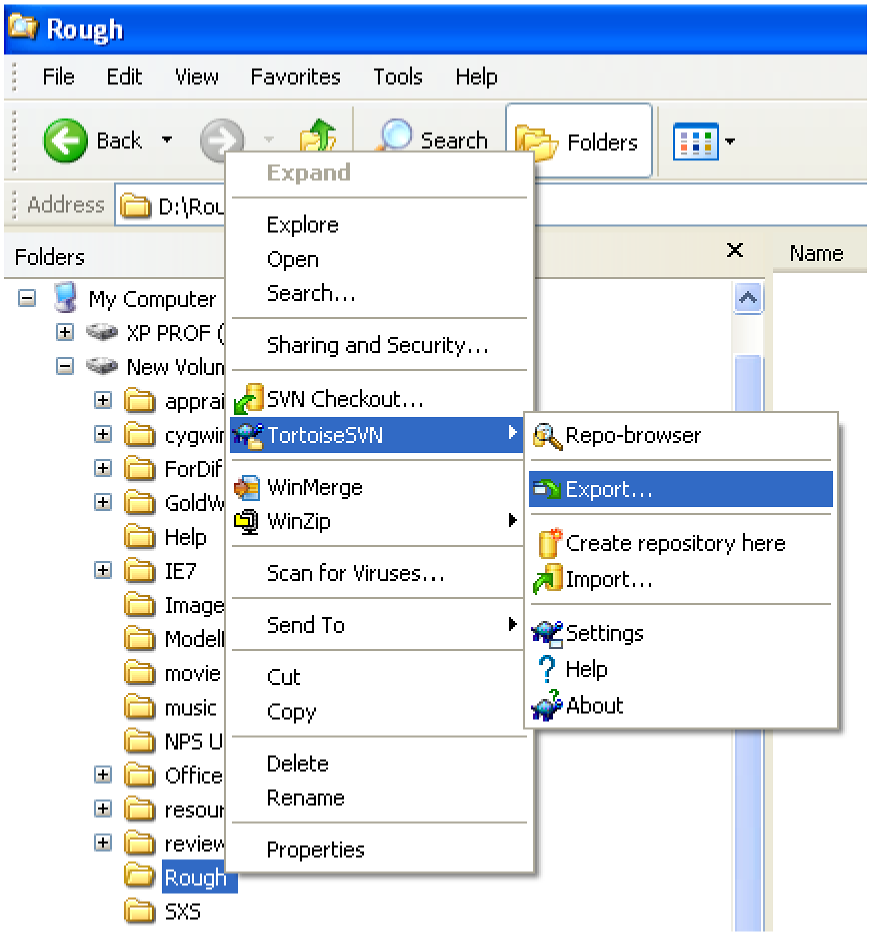
The conflicts are now resolved as shown by the green tick icons.

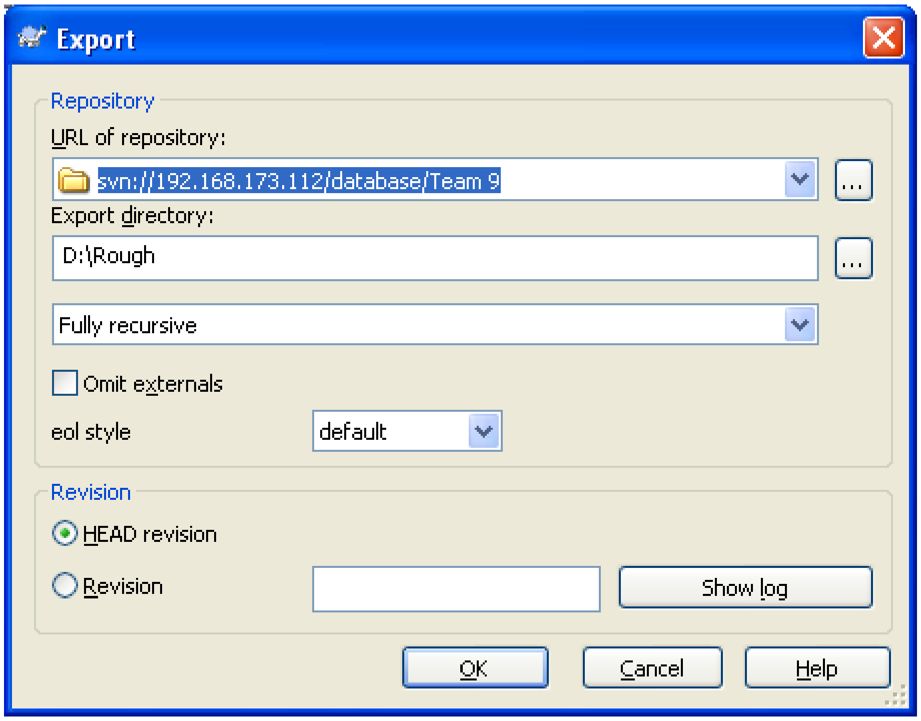


Additional Info: SVN Export…

Suppose you want to review the documents and files of user ‘Team 9’, you need not (or rather should not) check-out their files from the SVN repository. Check-outs are necessary when multiple people are working on the same file (most probably, for incorporating different functionality or enhancements into the same source file, or for changing different portions of a document), in which case they need to update their local copy before committing their changes so as to avoid conflicts. However, if your intention is just to view the files of a user, OR to review certain files of a user, you could just do an SVN Export on that file. This would bring the file to your directory where you could do the review. SVN export does not create the .svn folders and so does not track the changes to this local copy.

To get a local copy of files from ‘Team9’’s repository, let us first create new ‘Rough’ folder in our windows workstation, and then do a “SVN export…” as shown in the next three snapshots.




Export

Repository

URL of repository: svn://192.168.173.112/database/Team 9

Export directory: D:\Rough

Fully recursive

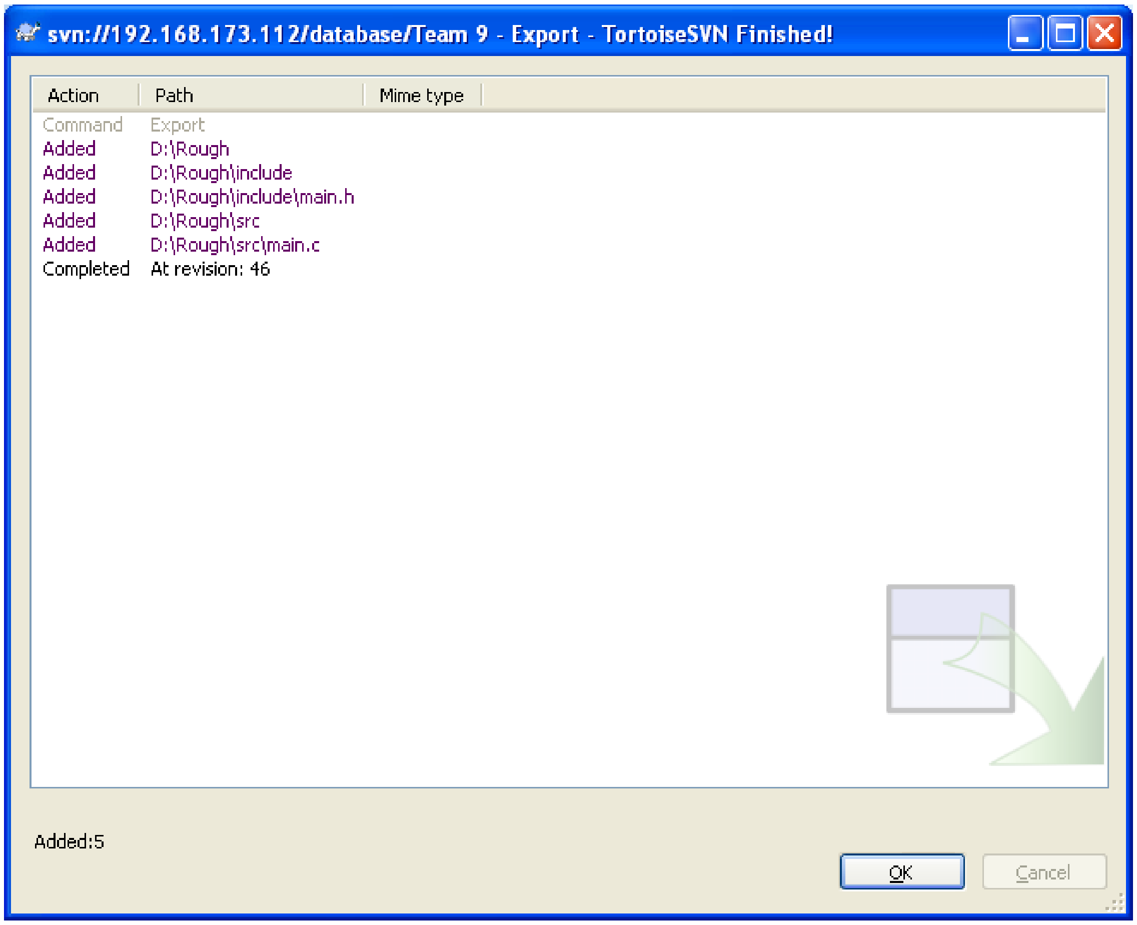
[ ] Omit externals

eol style: default

Revision

[✓ HEAD revision]

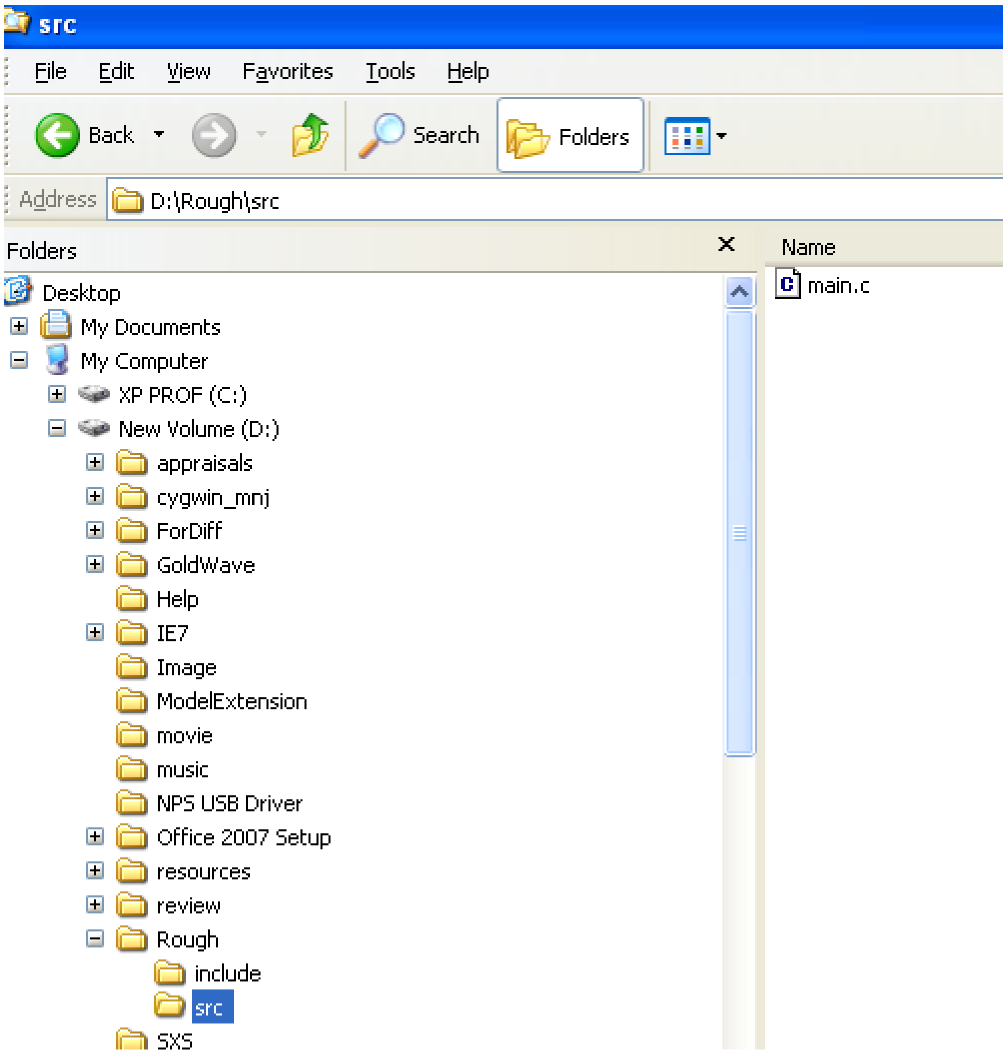
Revision


svn://192.168.173.112/database/Team 9 - Export - TortoiseSVN Finished!

```
Action      Path                          Mime type
Command     Export
Added       D:\Rough
Added       D:\Rough\include
Added       D:\Rough\include\main.h
Added       D:\Rough\src
Added       D:\Rough\src\main.c
Completed   At revision: 46
```

Added:5

We have got a local copy of 'Team 9' files.



Thank you and happy version controlling