Course Code: CSL601	Course Name:
Class :	Batch :
Roll no :	Name :

Experiment : 09

Aim : Change specification and make different versions using any SCM tool.

Theory :

What is change specification?

good specification makes the software product easier to update. Any change in the software requires to update the project requirement specification inviting every party involved in the process to rethink the changes to be made.

Moreover, SRS can be used like Functional Specification Document (FSD) or Product Requirement Document (PRD). SRS includes requirements that help write Functional Specification Document and can even include FSD, SRS describes all functionalities and explains how the functionality will inside a given system as a part of a larger system or as an independent system. FSD is the software-only part of an SRS document. Indeed, an SRS may contain hardware requirements, system interaction requirements as well.

It is crucial to writing a good software system requirements specification. Later in this blog post, we are going to analyze system requirement specification document examples to understand the difference between well written and poorly written specification. In the following section, we are going to see how to write a system requirement specification document.

What is version control?

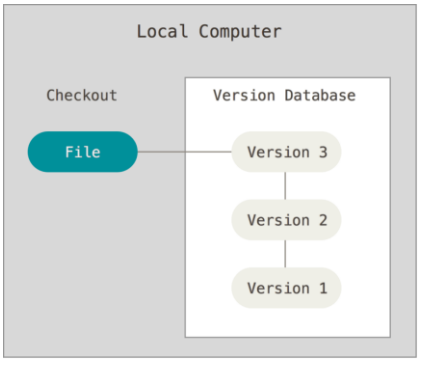
What is "version control", and why should you care? Version control is a system that records changes to a file or set of files over time so that you can recall specific versions later. For the examples in this book, you will use software source code as the files being version controlled, though in reality you can do this with nearly any type of file on a computer.

If you are a graphic or web designer and want to keep every version of an image or layout (which you would most certainly want to), a Version Control System (VCS) is a very wise thing to use. It allows you to revert selected files back to a previous state, revert the entire project back to a previous state, compare changes over time, see who last modified something that might be causing a problem, who introduced an issue and when, and more. Using a VCS also generally means that if you screw things up or lose files, you can easily recover. In addition, you get all this for very little overhead.

- **Local Version Control Systems**

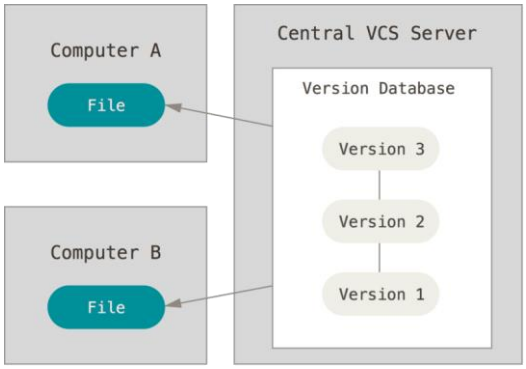
Many people's version-control method of choice is to copy files into another directory (perhaps a time-stamped directory, if they're clever). This approach is very common because it is so simple, but it is also incredibly error prone. It is easy to forget which directory you're in and accidentally write to the wrong file or copy over files you don't mean to.

To deal with this issue, programmers long ago developed local VCSs that had a simple database that kept all the changes to files under revision control.



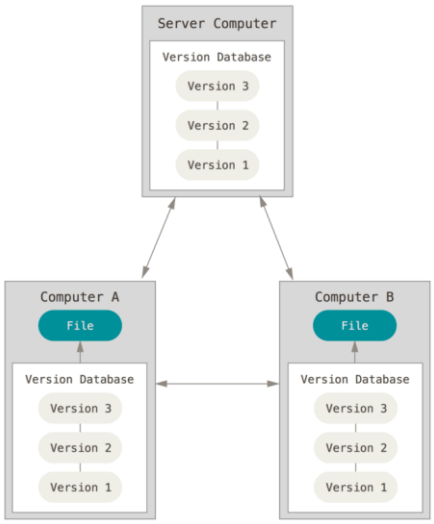
- **Centralized Version Control Systems**

The next major issue that people encounter is that they need to collaborate with developers on other systems. To deal with this problem, Centralized Version Control Systems (CVCSs) were developed. These systems (such as CVS, Subversion, and Perforce) have a single server that contains all the versioned files, and a number of clients that check out files from that central place. For many years, this has been the standard for version control.



- **Distributed Version Control Systems**

This is where Distributed Version Control Systems (DVCSs) step in. In a DVCS (such as Git, Mercurial, Bazaar or Darcs), clients don't just check out the latest snapshot of the files; rather, they fully mirror the repository, including its full history. Thus, if any server dies, and these systems were collaborating via that server, any of the client repositories can be copied back up to the server to restore it. Every clone is really a full backup of all the data.



Explain SCM?

In software engineering, software configuration management (SCM or S/W CM)[1] is the task of tracking and controlling changes in the software, part of the larger cross-disciplinary field of configuration management.[2] SCM practices include revision control and the establishment of baselines. If something goes wrong, SCM can determine what was changed and who changed it. If a configuration is working well, SCM can determine how to replicate it across many hosts.

The acronym "SCM" is also expanded as source configuration management process and software change and configuration management.[3] However, "configuration" is generally understood to cover changes typically made by a system administrator.

The goals of SCM are generally:[citation needed]

- Configuration identification - Identifying configurations, configuration items and baselines.

- Configuration control - Implementing a controlled change process. This is usually achieved by setting up a change control board whose primary function is to approve or reject all change requests that are sent against any baseline.
- Configuration status accounting - Recording and reporting all the necessary information on the status of the development process.
- Configuration auditing - Ensuring that configurations contain all their intended parts and are sound with respect to their specifying documents, including requirements, architectural specifications and user manuals.
- Build management - Managing the process and tools used for builds.
- Process management - Ensuring adherence to the organization's development process.
- Environment management - Managing the software and hardware that host the system.
- Teamwork - Facilitate team interactions related to the process.
- Defect tracking - Making sure every defect has traceability back to the source.

Explain any 5 popular SCM tools?

1. GitLab:

GitLab is yet another repository management tool that is hosted on the free hosting service named GitLab.com, alongside that it also offers Git repository management function with features as like access control, bug tracking, and code reviewing. GitLab CI is completely unified with GitLab and it is very easy to use to link projects via the usage of GitLab API. Built using the Go language, GitLab has the ability to execute on various operating systems as like Windows, Linux, Docker, OSX, and FreeBSD.

2. Bitbucket Server:

Atlassian' s offering in the form of Bitbucket Server is a combination of GIT server and web interface product. It is usually a web-based hosting solution that is targeted for projects which use either of Mercurial or GIT version control systems. This tool is specifically developed for the professional teams, as it not just enables users to code but also to manage and collaborate on GIT projects.

3. Mercurial:

Mercurial is a free and also a distributed source control management tool that handles projects of any size efficiently. It is a cross platform solution as it is available for Windows, FreeBSD, Mac OS X and Linux Operating systems. The Mercurial project was initiated just in the same era as was the time when GIT was getting developed. As a matter of fact, GIT was adopted for version control for Linux projects and Mercurial was adopted by many other development projects per se. Mercurial is still under active development and the latest release that we have is release 3.8.4 as on 1st July 2016.

4. Gerrit:

Gerrit is yet another GIT based SCM tool that manages lot more than just code reviews. It helps in spreading the popular distributed revision control systems (DRCS) tools into the android using companies which fund heavily on having healthy quality assurance, management and legal processes in the software world. Gerrit is a free and also an open source web based team code collaboration tool. Developers from a team can review each other's code changes using the Web browser and based on the changes can either approve or reject them.

5. GitHub:

Most of the developers who are in the industry already would have heard about GitHub, but it also frustrates a lot of developers till date on what exactly is it intended for. All that being said, yet a lot of people don't really understand what it does. GitHub is an awesome SCM tool that helps bring teams to get together in the process of resolving problems with the code changes that they bring in to the existing code. They move ideas forward, learn from each other along the whole way. GitHub an amazing SCM tool which lies on the same grounds of Git and the others is also the best places to share code with Friends, Colleagues and etc. GitHub has also seen a lot of user acceptance along with the other SCM tools being available in the market for years.

Output :

1. git config

```
aiktc@aiktc-OptiPlex-3046: ~/Desktop/OnlineAdaptiveAssessmentPlatform
File  Edit  View  Search  Terminal  Help
aiktc@aiktc-OptiPlex-3046:~/Desktop/OnlineAdaptiveAssessmentPlatform$ git config --global user.name "shadabsk123"
aiktc@aiktc-OptiPlex-3046:~/Desktop/OnlineAdaptiveAssessmentPlatform$
aiktc@aiktc-OptiPlex-3046:~/Desktop/OnlineAdaptiveAssessmentPlatform$
aiktc@aiktc-OptiPlex-3046:~/Desktop/OnlineAdaptiveAssessmentPlatform$ git config --global user.email "shaikhshadabali123@gmail.com"
aiktc@aiktc-OptiPlex-3046:~/Desktop/OnlineAdaptiveAssessmentPlatform$
aiktc@aiktc-OptiPlex-3046:~/Desktop/OnlineAdaptiveAssessmentPlatform$
aiktc@aiktc-OptiPlex-3046:~/Desktop/OnlineAdaptiveAssessmentPlatform$ git config --global user.name
shadabsk123
aiktc@aiktc-OptiPlex-3046:~/Desktop/OnlineAdaptiveAssessmentPlatform$
aiktc@aiktc-OptiPlex-3046:~/Desktop/OnlineAdaptiveAssessmentPlatform$
aiktc@aiktc-OptiPlex-3046:~/Desktop/OnlineAdaptiveAssessmentPlatform$ git config --global user.email
shaikhshadabali123@gmail.com
aiktc@aiktc-OptiPlex-3046:~/Desktop/OnlineAdaptiveAssessmentPlatform$
aiktc@aiktc-OptiPlex-3046:~/Desktop/OnlineAdaptiveAssessmentPlatform$
aiktc@aiktc-OptiPlex-3046:~/Desktop/OnlineAdaptiveAssessmentPlatform$ git config --global color.ui auto
aiktc@aiktc-OptiPlex-3046:~/Desktop/OnlineAdaptiveAssessmentPlatform$
aiktc@aiktc-OptiPlex-3046:~/Desktop/OnlineAdaptiveAssessmentPlatform$
aiktc@aiktc-OptiPlex-3046:~/Desktop/OnlineAdaptiveAssessmentPlatform$ git config --global color.ui
auto
aiktc@aiktc-OptiPlex-3046:~/Desktop/OnlineAdaptiveAssessmentPlatform$
aiktc@aiktc-OptiPlex-3046:~/Desktop/OnlineAdaptiveAssessmentPlatform$
aiktc@aiktc-OptiPlex-3046:~/Desktop/OnlineAdaptiveAssessmentPlatform$
```

2. init & clone

```
aiktc@aiktc-OptiPlex-3046: ~/Desktop/OnlineAdaptiveAssessmentPlatform
File  Edit  View  Search  Terminal  Help
aiktc@aiktc-OptiPlex-3046:~/Desktop/OnlineAdaptiveAssessmentPlatform$
aiktc@aiktc-OptiPlex-3046:~/Desktop/OnlineAdaptiveAssessmentPlatform$
aiktc@aiktc-OptiPlex-3046:~/Desktop/OnlineAdaptiveAssessmentPlatform$ git init
Initialized empty Git repository in /home/aiktc/Desktop/OnlineAdaptiveAssessmentPlatform/.git/
aiktc@aiktc-OptiPlex-3046:~/Desktop/OnlineAdaptiveAssessmentPlatform$
aiktc@aiktc-OptiPlex-3046:~/Desktop/OnlineAdaptiveAssessmentPlatform$
aiktc@aiktc-OptiPlex-3046:~/Desktop/OnlineAdaptiveAssessmentPlatform$ git clone https://github.com/shadabsk/OnlineTutorial-Web-APP-using-OOPHP-AJAX-Bootstrap-JQuery-MySQL-CSS3-.git
Cloning into 'OnlineTutorial-Web-APP-using-OOPHP-AJAX-Bootstrap-JQuery-MySQL-CSS3-'...
remote: Enumerating objects: 735, done.
remote: Counting objects: 100% (735/735), done.
remote: Compressing objects: 100% (580/580), done.
remote: Total 735 (delta 69), reused 725 (delta 64), pack-reused 0
Receiving objects: 100% (735/735), 18.61 MiB | 2.99 MiB/s, done.
Resolving deltas: 100% (69/69), done.
aiktc@aiktc-OptiPlex-3046:~/Desktop/OnlineAdaptiveAssessmentPlatform$
aiktc@aiktc-OptiPlex-3046:~/Desktop/OnlineAdaptiveAssessmentPlatform$
```

3. Status and add

```
aiktc@aiktc-OptiPlex-3046: ~/Desktop/Onl
File  Edit  View  Search  Terminal  Help
aiktc@aiktc-OptiPlex-3046:~/Desktop/OnlineAdaptiveAssessmentPlatform$ git statusOn branch master

No commits yet

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

        1 git config.png
        2 init clone.png
        AdminDash.php
        OnlineTutorial-Web-APP-using-OOPHP-AJAX-Bootstrap-JQuery-MySQL-CSS3-/
        StudentDash.php
        index.php
        login-form.php

nothing added to commit but untracked files present (use "git add" to track)
aiktc@aiktc-OptiPlex-3046:~/Desktop/OnlineAdaptiveAssessmentPlatform$
aiktc@aiktc-OptiPlex-3046:~/Desktop/OnlineAdaptiveAssessmentPlatform$ git add AdminDash.php
aiktc@aiktc-OptiPlex-3046:~/Desktop/OnlineAdaptiveAssessmentPlatform$
aiktc@aiktc-OptiPlex-3046:~/Desktop/OnlineAdaptiveAssessmentPlatform$ git add index.php
aiktc@aiktc-OptiPlex-3046:~/Desktop/OnlineAdaptiveAssessmentPlatform$
aiktc@aiktc-OptiPlex-3046:~/Desktop/OnlineAdaptiveAssessmentPlatform$ git add login-form.php
aiktc@aiktc-OptiPlex-3046:~/Desktop/OnlineAdaptiveAssessmentPlatform$
aiktc@aiktc-OptiPlex-3046:~/Desktop/OnlineAdaptiveAssessmentPlatform$ git add StudentDash.php
aiktc@aiktc-OptiPlex-3046:~/Desktop/OnlineAdaptiveAssessmentPlatform$
aiktc@aiktc-OptiPlex-3046:~/Desktop/OnlineAdaptiveAssessmentPlatform$ git status
On branch master

No commits yet

Changes to be committed:
  (use "git rm --cached <file>..." to unstage)

        new file:   AdminDash.php
        new file:   StudentDash.php
        new file:   index.php
        new file:   login-form.php

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

        1 git config.png
        2 init clone.png
        OnlineTutorial-Web-APP-using-OOPHP-AJAX-Bootstrap-JQuery-MySQL-CSS3-/

aiktc@aiktc-OptiPlex-3046:~/Desktop/OnlineAdaptiveAssessmentPlatform$
```

4. diff

```
aiktc@aiktc-OptiPlex-3046: ~/Desk
File  Edit  View  Search  Terminal  Help
aiktc@aiktc-OptiPlex-3046:~/Desktop/OnlineAdaptiveAssessmentPlatform$
aiktc@aiktc-OptiPlex-3046:~/Desktop/OnlineAdaptiveAssessmentPlatform$ git diff
diff --git a/index.php b/index.php
index 58327a1..77d0c5d 100644
--- a/index.php
+++ b/index.php
@@ -24,6 +24,12 @@
                        background-repeat: no-repeat;
                }

+               div#contact{^M
+                       height: 530px;^M
+               }^M
+               div#contact{^M
+                       height: 530px;^M
+               }^M
                div#contact{
                        height: 530px;
                }
aiktc@aiktc-OptiPlex-3046:~/Desktop/OnlineAdaptiveAssessmentPlatform$
aiktc@aiktc-OptiPlex-3046:~/Desktop/OnlineAdaptiveAssessmentPlatform$ git diff --staged
aiktc@aiktc-OptiPlex-3046:~/Desktop/OnlineAdaptiveAssessmentPlatform$
aiktc@aiktc-OptiPlex-3046:~/Desktop/OnlineAdaptiveAssessmentPlatform$
aiktc@aiktc-OptiPlex-3046:~/Desktop/OnlineAdaptiveAssessmentPlatform$
```

5. reset

```
aiktc@aiktc-OptiPlex-3046: ~/Desktop
File  Edit  View  Search  Terminal  Help
aiktc@aiktc-OptiPlex-3046:~/Desktop/OnlineAdaptiveAssessmentPlatform$ git reset index.php
Unstaged changes after reset:
M       index.php
aiktc@aiktc-OptiPlex-3046:~/Desktop/OnlineAdaptiveAssessmentPlatform$
aiktc@aiktc-OptiPlex-3046:~/Desktop/OnlineAdaptiveAssessmentPlatform$
aiktc@aiktc-OptiPlex-3046:~/Desktop/OnlineAdaptiveAssessmentPlatform$
aiktc@aiktc-OptiPlex-3046:~/Desktop/OnlineAdaptiveAssessmentPlatform$
```

6. commit

```
aiktc@aiktc-OptiPlex-3046: ~/Desktop/OnlineAdaptiveAssessmentPlatform
File  Edit  View  Search  Terminal  Help
aiktc@aiktc-OptiPlex-3046:~/Desktop/OnlineAdaptiveAssessmentPlatform$
aiktc@aiktc-OptiPlex-3046:~/Desktop/OnlineAdaptiveAssessmentPlatform$
aiktc@aiktc-OptiPlex-3046:~/Desktop/OnlineAdaptiveAssessmentPlatform$ git commit -m 'implemented login form, homepage and admin dashboard'
[master (root-commit) cbaebfa] implemented login form, homepage and admin dashboard
 4 files changed, 789 insertions(+)
 create mode 100644 AdminDash.php
 create mode 100644 StudentDash.php
 create mode 100644 index.php
 create mode 100644 login-form.php
aiktc@aiktc-OptiPlex-3046:~/Desktop/OnlineAdaptiveAssessmentPlatform$
aiktc@aiktc-OptiPlex-3046:~/Desktop/OnlineAdaptiveAssessmentPlatform$
```

7. branch

```
aiktc@aiktc-OptiPlex-3046: ~/Desktop/Onl
File  Edit  View  Search  Terminal  Help
aiktc@aiktc-OptiPlex-3046:~/Desktop/OnlineAdaptiveAssessmentPlatform$ git branch
* master
aiktc@aiktc-OptiPlex-3046:~/Desktop/OnlineAdaptiveAssessmentPlatform$
aiktc@aiktc-OptiPlex-3046:~/Desktop/OnlineAdaptiveAssessmentPlatform$
aiktc@aiktc-OptiPlex-3046:~/Desktop/OnlineAdaptiveAssessmentPlatform$ git branch adnanwork
aiktc@aiktc-OptiPlex-3046:~/Desktop/OnlineAdaptiveAssessmentPlatform$
aiktc@aiktc-OptiPlex-3046:~/Desktop/OnlineAdaptiveAssessmentPlatform$ git checkout adnanwork
M       index.php
Switched to branch 'adnanwork'
aiktc@aiktc-OptiPlex-3046:~/Desktop/OnlineAdaptiveAssessmentPlatform$
aiktc@aiktc-OptiPlex-3046:~/Desktop/OnlineAdaptiveAssessmentPlatform$
aiktc@aiktc-OptiPlex-3046:~/Desktop/OnlineAdaptiveAssessmentPlatform$ git merge master
Already up to date.
aiktc@aiktc-OptiPlex-3046:~/Desktop/OnlineAdaptiveAssessmentPlatform$
aiktc@aiktc-OptiPlex-3046:~/Desktop/OnlineAdaptiveAssessmentPlatform$
aiktc@aiktc-OptiPlex-3046:~/Desktop/OnlineAdaptiveAssessmentPlatform$ git checkout master
M       index.php
Switched to branch 'master'
aiktc@aiktc-OptiPlex-3046:~/Desktop/OnlineAdaptiveAssessmentPlatform$
aiktc@aiktc-OptiPlex-3046:~/Desktop/OnlineAdaptiveAssessmentPlatform$
aiktc@aiktc-OptiPlex-3046:~/Desktop/OnlineAdaptiveAssessmentPlatform$ git branch -d adnanwork
Deleted branch adnanwork (was cbaebfa).
aiktc@aiktc-OptiPlex-3046:~/Desktop/OnlineAdaptiveAssessmentPlatform$
aiktc@aiktc-OptiPlex-3046:~/Desktop/OnlineAdaptiveAssessmentPlatform$
aiktc@aiktc-OptiPlex-3046:~/Desktop/OnlineAdaptiveAssessmentPlatform$
```

8. log

```
aiktc@aiktc-OptiPlex-30
File  Edit  View  Search  Terminal  Help
aiktc@aiktc-OptiPlex-3046:~/Desktop/OnlineAdaptiveAssessmentPlatform$
aiktc@aiktc-OptiPlex-3046:~/Desktop/OnlineAdaptiveAssessmentPlatform$
aiktc@aiktc-OptiPlex-3046:~/Desktop/OnlineAdaptiveAssessmentPlatform$ git log
commit cbaebfad6c3f16f295c9815da6520ac73f6f66a4 (HEAD -> master)
Author: shadabsk123 <shaikhshadabali123@gmail.com>
Date:   Mon Apr 1 13:19:16 2019 +0530

    implemented login form, homepage and admin dashboard
aiktc@aiktc-OptiPlex-3046:~/Desktop/OnlineAdaptiveAssessmentPlatform$
aiktc@aiktc-OptiPlex-3046:~/Desktop/OnlineAdaptiveAssessmentPlatform$
aiktc@aiktc-OptiPlex-3046:~/Desktop/OnlineAdaptiveAssessmentPlatform$
```

Reference:

https://mindmajix.com/top-10-scm-devops-tools
https://git-scm.com/
https://git-scm.com/docs

Conclusion:
