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A
REPORT
OF
“Open Source Software Laboratory”
Code: 5IT452

B: Beginner (B)

Submitted by

MS. ADITI SUDHIR GHATE (2020BTEIT00044)
Email: aditighate003@gmail.com



19 DEPARTMENT OF INFORMATION TECHNOLOGY

WALCHAND COLLEGE OF ENGINEERING, SANGLI
(An Autonomous Institute)

37 2023-2024

CERTIFICATE



This is to certify that the report entitled "*Open Source Software Laboratory (OSS Lab) 5IT452*" submitted by **Miss. Aditi Sudhir Ghate (2020BTEIT00044)** is a record of the student's own work carried out by her during the academic year 2023-2024, as per the curriculum/syllabus laid down for OSS Lab at Final Year B.Tech IT Sem-I. She successfully carried out experiments/FOSS tools hands-on on 15 assignments under the BIE: Beginner (B) category.

Dr. A. J. Umbarkar
(Course Teacher)

DECLARATION

I, the undersigned, hereby declare that the B.TECH Report entitled “*Open Source Software Laboratory (OSS Lab) (5IT452)*” **submitted** by me to the OSS Lab report at Final Year B.Tech IT Sem-I is my original/experimented/experience work. I further declare ¹⁵that, to the best of my knowledge and belief, this report has not been previously submitted or copied by me.

I declare that this report reflects my thoughts about the subject in my own words. ⁹¹I have sufficiently cited and referenced the original sources, referred to or considered in this work. ¹⁸I have not misrepresented, fabricated, or falsified any idea/data/fact/source in this submission. I understand that any violation of the above will be cause for disciplinary action by the Course Teacher/Institute.

(Sign)
Miss. Aditi Sudhir Ghate

Date:

Place:

ACKNOWLEDGEMENT

We feel immense pleasure in submitting the report entitled “*Open Source Software Laboratory (OSS Lab) (5IT452)*”. We are thankful to our guide **Dr. A. J. Umbarkar** ³⁷ for their valuable guidance and kind help during implementing the OSS Lab.

Acknowledged By,
Miss. Aditi Sudhir Ghate

5IT452: Open-Source Software Lab (B: Beginner) Final Assignment List

1. Demonstration of Linux Distributions OS's and their purpose with comparisons. (Fedora/CentOS/any other/etc.: Any One)

Objective: To install and demonstrate Various Linux Distributions and their Purpose/comparison/differences.

Outcome: Self-learning/lifelong learning (PO: b, k, l)

A student is asked to study at least two Linux Distros, with their comparisons and installation on Virtual Box OR Installation Linux on a Live USB pen drive.

[https://fedoraproject.org/wiki/How_to_create_and_use_Live_USB]

In the Journal, they have to write information about that distro, such as:-

- i. Various versions of that distro with code name
- ii. Default desktop GUI
- iii. The main purpose of that
- iv. Package management of that distro
- v. List of Default Packages
- vi. Screenshots of that distros
- vii. Compare '/etc' hierarchy
- viii. Compare package managers
- ix. Pros/cons of both distros
- x. Which one is better for development and why?
- xi. Which one is easy to use (for the beginner) and why?
- xii. Explore any top 10 commands of that distro on the command prompt.
- xiii. Make the Official Repositories of **Fedora/CentOS** on the docker store (<https://hub.docker.com/>) and experiment with the above.

Reference:-

- i. List of Linux Distros:- <http://distrowatch.com/>
- ii. For installation on Virtual Box:-
<https://help.ubuntu.com/community/ListOfOpenSourcePrograms>
- iii. <http://www.psychocats.net/ubuntu/virtualbox>
- iv. <https://help.ubuntu.com/>

2. Use of Open Source tools for Project Management.

- (**Sonar, Targetprocess, Redbooth, Pivotal Tracker, OrangeScrum etc.: Any One**)

Objective: To install and ²⁷demonstrate the use of various open source software that is used in day to day life of software Engg.

Outcome: (PO: k, l)

Students have to experiment with the last two project management tools/software and they have to use them for their project/FOSS project/mini project.

In the journal, they have to write information about that tool such as:-

- i. Purpose behind that tool.
- ii. Various versions of those tools.
- iii. Installation and Configuration of that tool.
- iv. How to use that tool.

Reference:-

- i. <https://bitnami.com/stacks>
- ii. Sphinx for all lab/college documentation by the students.
- iii. <http://www.sonarqube.org/>
- iv. Wikipedia List Of Software:- http://en.wikipedia.org/wiki/List_of_free_and_open-source_software_packages
- v. ¹² Open Source Software Mega List:-
<http://www.datamation.com/open-source/open-source-software-the-mega-list.html>
- vi. https://fedoraproject.org/wiki/Education_Spin This has lots of relevant packages
- vii. <http://www.methodsandtools.com/tools/targetprocess.php>
- viii. ⁷⁷ <https://blog.capterra.com/free-open-source-project-management-software/>
- ix. <http://www.targetprocess.com/>
- x. <https://www.pivotaltracker.com/features/>
- xi. <https://redbooth.com/features>

3. Use of Bug Tracking

(Phabricator, Youtrack, Mantis, **Futuramo**, etc.: Any One)

(Submission by Individual [I])

Objective: To install and demonstrate the use of various open-source software that is used in day to day life of software engineering.²⁷

Outcome: (PO: k, l)

Students have to experiment with the last two bug-tracking tools/software and they have to use them for their project/FOSS project/mini project.

In the journal, they have to write information about that tool such as:-

- i. Purpose behind that tool.
- ii. Various versions of that tool.
- iii. Installation and Configuration of that tool
- iv. How to use that tool.
- v. Make the Official Repositories of anyone above **Bug Tracking** on the docker store (<https://hub.docker.com/>) and experiment.

Reference:-

- i. <https://bitnami.com/stacks> (<https://bitnami.com/stack/trac>)

ii. Wikipedia List Of Software:-http://en.wikipedia.org/wiki/List_of_free_and_open-source_software_packages

iii. ¹² Open Source Software Mega List:- <http://www.datamation.com/open-source/open-source-software-the-mega-list-1.html>

4. Use of Version Control System.

(**Mercurial (hg), Bazaar, Monotone, etc: Any One).**

(**Submission by Individual and Group [I and G]**)

Objective: To use the online and offline Version Control System in Open Source/for their project work.

Outcome: lifelong learning (PO: b, c, k, l)

Students have to experiment with any two **Version Control Systems** and use the tool for their project/FOSS project/mini project/ etc.

Sample code developments example of **Version Control System** on both Windows and Linux clients/server.

Make the Official Repositories of any one **Version Control System** on the docker store (<https://hub.docker.com/>) and experiment.

In the Journal, They have to write Basic Information about the **Version Control System**, commands, their working, diagrams, differences, pros and cons, developments, history, etc.

Reference:-

i. ⁵⁴ <https://try.github.io/levels/1/challenges/1>

ii. <https://github.com/princeton-8/princeton-8.github.io>

iii. http://wiki.openhatch.org/Open_Source_Comes_to_Campus/Practicing_Git/Students

iv. GIT Official Documentation:- <http://git-scm.com/documentation>

v. SVN Official Documentation:- ⁷⁴ <http://svnbook.red-bean.com/en/1.7/index.html>

vi. Perforce Helix ⁵² is a commercial, proprietary revision control system developed by Perforce Software

vii. ³⁴ <https://www.smashingmagazine.com/2008/09/the-top-7-open-source-version-control-systems/>

viii. <http://wiki.bazaar.canonical.com/WindowsDownloads>

5. Installation and Use of CMS Software.

(**Joomla, Mahara, XOOPS, DokuWiki, etc.: Any One**) OR (**Social Networking open source: Diaspora or other: Any One**)

(**Submission by Individual [I]**)

Objective: To comprehend the use of Content Management Systems and their Use for personal website/dept CMS.

Outcome: Self-learning (PO: b, I, j, k, l)

Students have to study at least one **CMS** and one **Wiki**. Use **Wiki** to give the information to class students to perform FOSS assignments. Use **CMS** for creating your personal website/blog or FOSS course website/blog.

In Journal, They have to write,

- i. Administration of CMS/wiki.
- ii. How to Use.
- iii. Installation on Linux Platform.
- iv. Screenshots.
- v. Make the Official Repositories of any one **CMS/Wiki** on the docker store (<https://hub.docker.com/>) and experiment.

References:-

- i. www.wordpress.com
- ii. Drupal Tutorials:- <http://drupal.org/documentation/customization/tutorials>
- iii. Moodle Tutorials:- http://docs.moodle.org/22/en/Moodle_video_tutorials
- iv. <https://bitnami.com>

6. Comprehend the Open Source Software Development for any one Linux distro. (Topic 3rd in Syllabus) (Fedora/CentOS, etc: Any One)

Objective: To comprehend open-source software development.

Outcome: Self-learning/lifelong learning (PO: b, k, l)

In this students have to study the open source software development process of **any one above Linux distro**.

Get the details following information –Name of community, website, Mailing List, wiki, version control, bug tracking, and documentation of the particular distro to comprehend.

Sample of Ubuntu Development:-²⁸

- i. Development Communities:- <http://www.ubuntu.com/community>
- ii. Mailing List:- <https://lists.ubuntu.com/>
- iii. IRC channels:- <https://wiki.ubuntu.com/IRC/ChannelList>
- iv. Ubuntu Wiki:- <https://wiki.ubuntu.com/>
- v. Ubuntu Version Control:- <https://code.launchpad.net/ubuntu>
- vi. Ubuntu Bug Tracking:- <https://bugs.launchpad.net/ubuntu>
- vii. Ubuntu Localization:- <https://translations.launchpad.net/ubuntu>
- viii. Ubuntu Documentation:- <https://help.ubuntu.com/community>

Sample of Fedora

- I. <https://getfedora.org/>
- II. <https://fedoraproject.org/wiki/IRC>
- III. <https://fedoraproject.org/wiki/>
- IV. <https://fedoraproject.org/wiki/Packaging:Versioning>
<https://fedoraproject.org/wiki/Infrastructure/VersionControl>

- V.¹⁴ <https://fedoraproject.org/wiki/Bugzilla>
Vi. <https://fedoraproject.org/wiki/Category:Localization>
Vii. <https://docs.fedoraproject.org/en-US/index.html>

Sample of Mint

- i. mint Version Control <http://community.linuxmint.com/software/view/subversion>
- ii. Mint Bug Tracking:- <http://forums.linuxmint.com/viewtopic.php?f=60&t=157099>
- iii. Mint Localization:- <http://www.linuxmint.com/communities.php>
- iv. Mint Documentation:- <http://www.linuxmint.com/documentation.php>

7. Compilation of Linux Kernel selected above.

(Fedora/CentOS, etc: Any One)

Objective: To demonstrate how to compile Linux Kernel.

Outcome: Self-learning (PO: k, l)

In this students have to do the compilation of anyone mentioned above Linux distro Linux Kernel on their system/VMware/Virtual box or pen drive or docker container.

Reference:-

- i. Installation Of Linux Kernel on Fedora:-

<http://www.howopensource.com/2011/08/how-to-install-compile-linux-kernel-3-0-in-fedora-15-and-14/>

Or/and

- ii. https://fedoraproject.org/wiki/Building_a_custom_kernel
- iii. Latest kernel installation on Fedora and Cent OS:- <http://www.tecmint.com/kernel-3-5-released-install-compile-in-redhat-centos-and-fedora/>
- iv. <http://tldp.org/guides.html>
- v. Installation Of Linux Kernel on
Ubuntu: <http://www.howopensource.com/2011/08/how-to-install-compile-linux-kernel-3-0-in-fedora-15-and-14/>

Latest kernel installation on:- <http://www.backtracklinux.org/forums/showthread.php?t=49347>

Installation of Linux Kernel on

Suse: <http://www.howopensource.com/2011/08/how-to-install-compile-linux-kernel-3-0-in-fedora-15-and-14/> <https://en.opensuse.org/Kernel>

In Journal you have to write the step-by-step process of compilation.

8. Create RPM or DEB packages

Objective: To Create a package for any above Linux distros.

Outcome: (PO: b, I, j, k, l)

Students have to study RPM or DEB package building for their C, C++ or JAVA Codes(any one programming language code). They must build an rpm or debian package and install it through package manager such as YUM or APT-GET

Reference:-

- i. Build Simple rpm package:- http://rhce.dposs.org/index.php?title=Build_a_simple_RPM_that_packages_a_single_file
- ii. Fedora rpm doc:- http://fedoraproject.org/wiki/How_to_create_an_RPM_package
- iii. Simple DEB package for your C code:- <http://linuxconfig.org/easy-way-to-create-a-debian-package-and-local-package-repository>
- iv. Simple DEB build guide:- <http://askubuntu.com/questions/90764/how-do-i-create-a-deb-package-for-a-single-python-script>
- v. Deb Package Build YouTube:- <http://www.youtube.com/watch?v=nhoRyd2CEVs>

In Journal you have to write the package building process.

9. Install and demonstrate Server-based services and their Uses.

(web server Apache or Tomcat or IIS, NFS, NIS: Any One)

Objective: To know server installations and Configurations on the Linux Platform

Outcome: (PO: b, I, j, k, l)

Students are asked to install and configure at least 2 servers, such as FTP, HTTP server (web server), TELNET, NFS, NIS, etc. All configurations must be done on the Linux Platform

In the Journal, they have to write installations, Configurations, and Screenshots of the server on which they worked.

Make the Official Repositories of any one above servers on the docker store (<https://hub.docker.com/>) and experiment.

References:-

- i. Server World:- <http://www.server-world.info/en/>
- ii. Yolinux :- <http://www.yolinux.com/>
- iii. GUI-based tool for server configuration Webmin <http://www.webmin.com/index.html>

10. Development of new Open Source Software or contribution to existing Open Source Software.

(Any small application other than Music Player or Calculator or Text Editor in java/python/perl/c/cpp/etc: Any One or New open source development).

Objective: To contribute/introduce the open source software by understanding the GPL Licensing.

Outcome: Self-learning/lifelong learning (PO: b, I, j, k, l)

- a. Develop simple software for basic needs such as a Calculator, editor, etc.

Use the following:-

- i. Language:- C/C++, Python, Perl, PHP, Java, .net
 - ii. Version Control:- GIT or SVN
 - iii. Package Building:- Debian or rpm
 - iv. Translation:- Marathi or Hindi
 - v. Documentation:- Use Mallard for your Help
-
- b. Make the Official login on online repositories of open source projects with valid login by individual and ask group too. Take any above suitable open project from an online open source project and add features/options/GUI/remove error/modules/etc.
 - c. Appreciation mail may be received from the main developer/introducer if your contribution is quality and remarkable.

References:-

- i. <http://teachingopensource.org/start-contributing-using-open-source-software/>
- ii. <https://www.fossology.org/get-started>
- iii. <http://foss2serve.org/index.php/Category:Projects>
- iv. http://www.hfoss.org/index.php/project_gallery
- v. GIT version control Tutorial:- <http://git-scm.com/documentation>
- vi. SVN :- <http://michael-zamir.blogspot.in/2012/01/svn-tutorial.html>
- vii. Translation
:-<http://www.tuxamito.com/joomla/index.php/es/component/content/article/60-gettext-tutorial>
- viii. Using Malarad:- <http://projectmallard.org/about/learn/tenminutes.html>
- ix. http://www.hfoss.org/index.php/project_gallery
- x. <http://www.shlomifish.org/philosophy/computers/open-source/how-to-start-contributing/tos-document.html>

In Journal you have to write the process in Brief.

11. Docker container: An open-source software development platform (any two)

Objective: To understand and use the docker virtualization as OSS.

Outcome: Self-learning/lifelong learning (PO: b, I, j, k, l)

- a. With the help of Docker/Container show the any one above Linux distros selected. (in assignment 1.)
- b. 1. Create an image/container of any FOSS tool and upload it on Docker Hub.
2. Pull images/containers from docker-hub: <https://hub.docker.com/>
- c. (FOSS tool bug tracking tool, Project management tool, Version control system, CMS, python, java language running/compilation support, etc., and follow respective tool assignment)

- d. Contribute/Introduce the docker/container to make the resource management easy and lighter.
- e. Create IPC between two OS containers. *** for TY UOS***
- f. With the help of Docker-compose deploy the ‘Wordpress’ and ‘Mysql’ container and access the front end of ‘Wordpress’
- g. Docker image:
 - A. Create a simple Hello-world python flask application and create the docker image of that Flask application.
 - B. Run the docker container from a recently created image and run that docker container to the 5000 port of the host system.
 - h. Create the ‘nginx’ container from the ‘nginx’ image. And create the load balancing so that if we go to the address of ‘nginx’ it can redirect it to the above-created applications (Flask and Wordpress).

Note. Docker has to be installed first, to carry out docker-based experiments. Prefer the Linux OS to do this assignment.

References:-

- i. <https://www.docker.com/>
- ii. <https://opensource.com/resources/what-docker>
- iii. <https://mobyproject.org/>
- iv. <https://labs.play-with-docker.com/>

Extra Resources docker/container learning:

1. play with docker
<http://labs.play-with-docker.com/>
2. docker curriculum on GitHub
<https://docker-curriculum.com/>
3. awesome-docker on GitHub
<https://github.com/veggiemonk/awesome-docker>
4. docker cheat sheet
42
https://www.docker.com/sites/default/files/Docker_CheatSheet_08.09.2016_0.pdf
<https://github.com/wsargent/docker-cheat-sheet>
5. basics of docker pdf used in workshop
<ftp://10.10.13.13/BasicsofDocker.pdf>

12. Find Python kernel code and compile it or use any Python library for any application. (Submission by Individual or Group [I])

Objective: To use the Python open-source-ready module for application development.

Outcome: Self-learning/lifelong learning (PO: b, I, j, k, l)

Example:

1. A Python library to write a table in various formats: CSV / Elasticsearch / HTML / JavaScript / JSON / Jupyter Notebook...
2. Python Driver for ArangoDB, a NoSQL graph database
3. A fast image processing library with low memory needs.
4. Any work on Concurrency and Parallelism

Libraries for concurrent and parallel execution.

- `eventlet` - Asynchronous framework with WSGI support.
- `gevent` ⁷² - A coroutine-based Python networking library that uses `greenlet`.
- `multiprocessing` - (Python standard library) Process-based "threading" interface.
- `threading` - (Python standard library) Higher-level threading interface.
- `Tomorrow` - Magic decorator syntax for asynchronous code.
- `uvloop` - Ultra fast implementation of asyncio event loop on top of libuv.

Profiler

- `line_profiler` - Line-by-line profiling.
- `memory_profiler` - Monitor Memory usage of Python code.
- `profiling` - An interactive Python profiler.
- `vprof` - Visual Python profiler.

Game Development : *Awesome game development libraries.*

- ²⁹ `Cocos2d` - cocos2d is a framework for building 2D games, demos, and other graphical/interactive applications. It is based on pyglet.
- `Panda3D` - 3D game engine developed by Disney and maintained by Carnegie Mellon's Entertainment Technology Center. Written in C++, completely wrapped in Python.
- `Pygame` - Pygame is a set of Python modules designed for writing games.
- `PyOgre` - Python bindings for the Ogre 3D render engine, can be used for games, simulations, and anything 3D.
- `PyOpenGL` - Python ctypes bindings for OpenGL and its related APIs.
- `PySDL2` - A ctypes-based wrapper for the SDL2 library.
- `RenPy` - A Visual Novel engine.

Ref: <https://github.com/vinta/awesome-python>

13. Agile s/w engineering by using Tuleap, review board, and gitea (tools of agile setup)

<https://www.tuleap.org/> 1. Read and register for online use. (B and I)

- Offline use, setup Tuleap, review board, and gitea setup on docker container?(E)
- Share your tool details setup, usage, videos link etc in the assignment write-up. Take a small final-year project in this environment as a case study for demonstration.
- This assignment is introduced in the year 19-20 for the first time.

14. Learn Open source programming language GO (Compulsory for E)

- Write 3 suitable programs using GO language.
- Compare GO language with functional and procedural languages.

- Enlist the features of GO language
- Commands and compiler, debuggers of GO.
- Applications of GO language
- Put programs (with statements) in write-up with compilation steps details and upload.

15. Bonus Assignments.

1. **Create a poster by an individual for a foss tool, using the dia online drawing tool. (for 2 additional bonus marks in ise) Use Flowchart Maker & Online Diagram Software:**
<https://www.draw.io/>

Uses of tools, Describe working diagrams/steps, information of commands, etc. in the poster.
 Give links to good ref sites/videos.

Exported SVG file format and Upload this entire folder as one zipped file on schoology.

2. **Emac editor experience for coding, documentation, indentation, foss std/Google std coding in languages (1 mark bonus)**

Experiment with Emac editor on Linux/Windows for coding, documentation, indentation, foss std/Google std coding in languages like c,cpp, python, java, latex, etc.

In word file upload

1. Give details/steps of emac editor installation and packages of coding, documentation, indentation, foss std/Google standard d coding.
2. Explain your experience of coding with Emac editor.
3. Compare Emac with Eclipse IDE.
4. Give important links/references/videos of Emac editor.

3. **FOSS HacktoberFest Pull requests can be made in any GitHub-hosted repositories/projects (Optional to Assignment 10)**

This is an Optional assignment to Assignment 10. Do anyone at least.

Visit this site before starting and read the first page carefully.

Every year October is FOSS month.... Hence this is a FOSS contribution initiative.

<https://hacktoberfest.digitalocean.com/>

Steps.

1. Create an account on the above link.
2. Make 4 valid Pull Requests on GitHub between 1st and 31st October.
3. Post the screenshot of your Hacktoberfest profile and a screenshot of your GitHub Profile on Schoology. (In a write-up of this assignment)
4. Give details of all 4 Pull Requests in the write-up.
5. Also attach the screenshot of the email in the write-up.
4. **(Extra bonus)Sugar¹¹ is an activity-focused, free/libre open-source software learning platform for children.**

<https://sugarlabs.org/>

Sugar¹¹ is an activity-focused, free/libre open-source software learning platform for children.

Collaboration, reflection, and discovery are integrated directly into the user interface. Through Sugar's clarity of design, children¹¹ and teachers have the opportunity to use computers on their own terms. Students can reshape, reinvent, and reapply both software and content into powerful learning activities. Sugar's focus on sharing, criticism, and exploration is grounded in the culture of free software (FOSS)

5. **Create a Video about any one FOSS tool that liked by you (bonus 1 mark)**

Upload the Video on YouTube and give the YouTube link here

6. **Discussion on all assignments (active involvement with technical content will bonus 1 mark in ise) Put the good URL/website pdf link, how-to-do, and video links here for other help on assignments. (active involvement with technical content will bonus 1 mark in ise)**

Note:-

- i. All assignments first need to be written in Word soft form as per the format of Word (attached with the assignment list). Finally, at the end of all assignments, merge all assignments in the form of a journal using Word Template format or latex template (given on Schoology). Final well-formatted (English checked/plagiarism checked /reference/ page no/ etc) journal expected at the end of the course for getting journal marks.
- ii. Submit all assignments to **schoology.com** on time as per instructions.
- iii. See ISE plan for marks allotments.

Course Objective:

1. To Configure Open Source Software.
2. To contribute/ develop software (system) for an open source environment.
3. To use FOSS for Software Engineering.

Percentage of Objective achieved by students:

Objective No.	Not achieved	0% achieved	0% achieved	00% achieved
1				
2				
3				

Course Learning Outcomes:

1. Use of FOSS in software development
2. Understanding the economics of FOSS
3. Define free software and open source FOSS Software.

Percentage of Outcome achieved by students:

Outcomes	Not achieved	40% achieved	70% achieved	100% achieved
1				
2				
3				

Miss. Aditi Sudhir Ghate
(Sign)

1

Program Outcomes:

- a. **Engineering Knowledge:** Apply the knowledge of mathematics, engineering run and computational science to the solution of engineering problems.
- b. **Problem Analysis:** Identify, formulate, interpret and analyze the complex engineering problems leading to substantiated conclusions
- c. **Design/Development of Solutions.** Design systems, components or processes to meet desired needs within realistic constraints such as economic, environmental, societal and ethical considerations.
- d. **Conduct investigations of Complex Problems:** Use research based knowledge and methods including design of experiments, analysis, interpretation and synthesis of information to provide valid conclusions.
- e. **Modern Tool Usage:** Select and apply appropriate techniques, engineering skills and modern IT tools to prototype the model of complex engineering activities.
73. f. **The Engineer and Society:** Apply contextual knowledge pertaining to social, secure, Legal and cultural issues with consequent responsibilities relevant to IT.
- g. **Environment and Sustainability:** Understand the impact of the professional engineering solutions in social, environmental and the global contexts, demonstrating the knowledge of and the need for sustainable development.
- h. **Ethics:** Apply ethical principles and commit to the professional ethics with responsibilities and norms of the engineering practices.
- i. **Individual and Team Work:** Work effectively as an individual as well as a member or a leader in diverse teams for multidisciplinary settings.
- j. **Communication:** Communicate effectively with the engineering community and with society at large, such as, being able to comprehend and write reports and design documentation to make effective presentations.
- 1 k. **Project Management and Finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply those to original work or contemporary issues, as a member or land a leader in a team or an entrepreneur to manage projects in multidisciplinary environments.
- l. **Life-long Learning:** Recognize the need and prepare to engage independently and in lifelong learning.

PO Mapping with Tutorial List:

Assignment No PO											
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
18											

Miss. Aditi Sudhir Ghate
(Sign)

Course Learning outcomes:

CO	After the completion of the course the student should be able to	Bloom's Cognitive	
		Level	Descriptor
CO1	Exercise the FOSS tools in software development.	3	Applying
CO2	Analyze the economics of FOSS.	4	Analyzing
CO3	Create new FOSS or contribute to existing FOSS and FOSS environment	6	Creating

CLO mapping with assignment list

Sr.	Assignment	BIE	% Copy	Mapping	category
1	Demonstration of Linux Distributions OS's and their purpose with comparisons.	E	5%	CO1	Application
2	Use of Open Source tools for Project Management.	E	1%	CO2	Application
3	Use of Bug Tracking	E	1%	CO1	Knowledge
4	Use of version control system	E	0%	CO2	Application
5	Installation and Use of CMS software	E	5%	CO1	Application
6	Comprehend the open source software development or any one Linux Distro	E	1%	CO3	Synthesis Design
7	Compilation of Linux kernel	E	1%	CO3	Synthesis
8	Creation of RPM or DEB packages	E	0%	CO2	Application
9	Install and demonstrate server based services and their uses	E	5%	CO2	Application
10	Development of new Open Source Software or contribution to existing Open Source Software.	E	1%	CO2	Application
11	Docker container: An open source software development platform	E	1%	CO2	Application

12	Find python kernel code and compile it or use any python library for any application.	E	0%	CO3	Application
13	<u>Agile</u> s/w engineering by using Tuleap, review board, and git (tools of agile setup)	E	5%	CO1	Synthesis Design
14	Learn Open source programming language GO	E	1%	CO2	Knowledge
15	Bonus Assignments.	E	1%	CO2	Creating

Rubrics Used:

1. Quiz Objective
2. Class Questioning.
3. Quiz Subjective
4. Open Book Test
5. Assignment
6. Program
7. Seminar
8. Mini project
9. PPT
10. Demo Simulator
11. ISE1/ISE2/ESE

Rubrics mapping with assignment list:

Self Evaluation by Student:

Department of Information Technology, WCE, Sangli

Name of student	Exam no.	Email ID	Roll no.	Sign
Aditi Ghate	2020BTEIT00044	aditighate003@gmail.com	44	

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Sr.No	Title	Page Number
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2.	Use of project management tools for project management.	25-31
3.	Use of Bug Tracking	32- 39
4.	Use of version control system	39-45
5.	Installation and Use of CMS software (Drupal)	45-49
6.	Ubuntu Open Source Software Development	49-50
7.	Compilation of Linux Kernel	50-58
8.	Create of RPM or DEB packages	58-60
9.	Install and demonstrate various Server based services and their Uses.	61-62
10.	Development of new OSS or contribution to existing OSS (Music player or calculator)	63-67
11.	Docker container- An OSS virtualization command practice, use and understanding.	67-70
12.	Find python kernel code and compile it or use any python library for any application.	70-72
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18.	Licensing (terms and conditions) comparisons: 1. Social media 2. Email 3. Public cloud 4. Proprietary sw 5. FOSS	74-76

ASSIGNMENT 01

Title:- Demonstration of Various Linux Distributions and Their Purpose with Comparisons(Fedora)

Installation of various linux distributions.

Objective :-

To install and demonstrate Fedora Linux Distributions and their Purpose/comparison/differences.

Outcome :-

Self learning/lifelong learning (PO: b, k, l) .

Instruction for the Assignment

Students have to study at least two Linux distributions, with their comparisons and installation.

Various Distributions:

1. Fedora :-

Fedora, formerly known as Fedora Core, is a Unix-like operating system rooted in the Linux kernel and GNU programs. It operates as a community-supported Linux distribution, developed by the Fedora Project and backed by sponsorship from Red Hat. Comprising software distributed under diverse free and open-source licenses, Fedora strives to stay at the forefront of emerging technologies. Notably, Fedora serves as the upstream source for the commercial Red Hat Enterprise Linux distribution.

Versions:-

1. Fedora 27 was released on November 14, 2017.
2. Fedora 26 was released on July 11, 2017.

Default Desktop Environment:-

GNOME is the default desktop environment provided for Fedora.

2. Features:-

- Support for multiple repositories.
- Streamlined configuration.
- Dependency calculation utilizing modern solving technology.
- Improved speed and reduced memory footprint.
- Consistent behavior with RPM.
- Package group support, encompassing multiple-repository groups.
- User-friendly interface.

- Well-documented, robust Python API.
- Compatibility with both Python 2 and Python 3.

Package Management: DNF, the next-generation version of yum, maintains CLI compatibility with yum while establishing a rigorous API for extensions and plugins. Plugins have the capacity to enhance or modify DNF features, including the addition of extra CLI commands beyond those detailed below. To locate and install the package associated with a specific command, including those mentioned below, use the appropriate virtual provider in the form of the dnf command. For instance, use "dnf-command (repo query)" for a repo query command. This approach also applies when specifying dependencies for packages requiring a particular command.

5. Installation Steps:

1. Start VMWare Workstation.
2. Select New File.
3. Drag Fedora 22 ISO image and drop it into the Create a Virtual Machine window.
4. Follow the prompts to complete the installation.

List of Top Commands

1. dnf update Update the system
2. dnf- install package-name -_i Install the package you want. Re- place package-name with the actual name of the package
3. dnf -d source source-package-name
4. dnf remove package-name
5. dnf reboot

Difference between Fedora and Ubuntu

Ubuntu	Fedora
Ubuntu is a Debian Based OS.	Fedora is a community based project by Redhat.
Ubuntu was initially released in October 2004.	Fedora was initially released in November 2003.
Ubuntu allows one-click installation for nvidia graphics driver.	It is a bit complicated and hard to install nvidia graphics driver in fedora.
Ubuntu uses Ubiquity installer for installing Ubuntu.	Fedora uses anaconda installer for installing Fedora.
Ubuntu uses apt, dpkg, Snap package manager.	Fedora uses DNF, RPM, YUM package manager.
Some of the popular applications of Ubuntu are- LibreOffice, Rhythmbox, Steam, Shotcut etc.	Some of the popular applications of Fedora are- Signal, Mozilla Firefox, LibreOffice, Dolphin File Manager etc.

Conclusion

1. Installation of various Linux versions.
2. Comparison of various distributions have been studied, and their desktop environments ,applications have been studied.

Reference

- ¹⁴ <https://fedoraproject.org/wiki/DNF?rd=DNF>
<https://fedoraproject.org/wiki/Packagemanagementsystem>
⁵⁹ <https://www.youtube.com/watch?v=aH9YDh8fa0Y>
<https://www.youtube.com/watch?v=NMzaMVGXjOA>
-

ASSIGNMENT 02

Title- Use of project management tools for project management.

Objective: To install, use and demonstrate the project management tool that is used in today 's life of a software engineer.

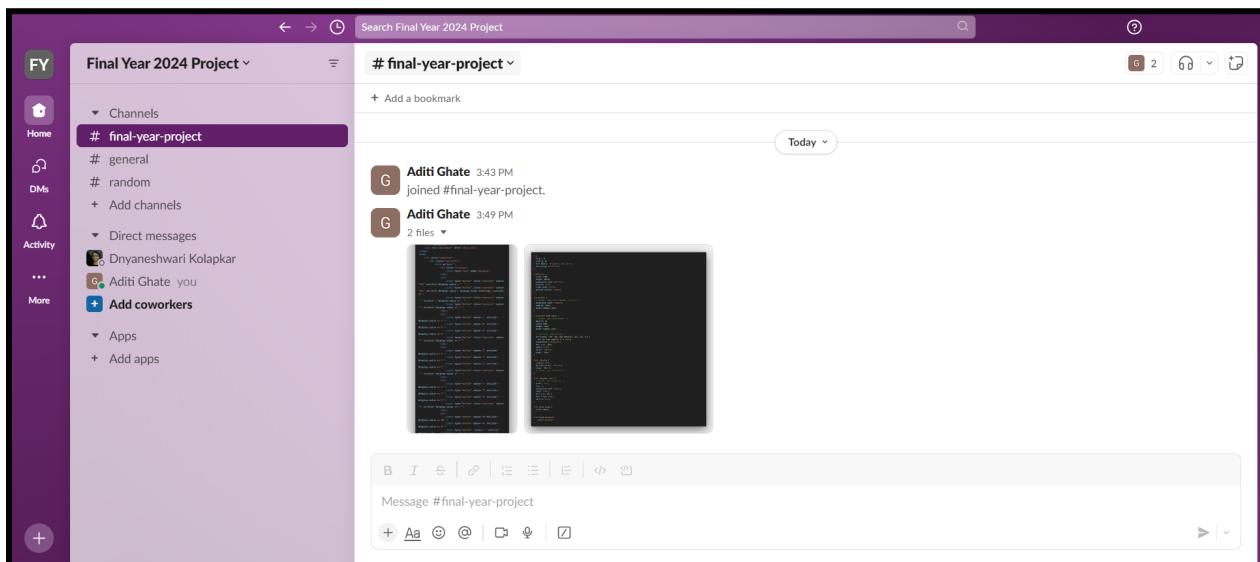
I] Slack

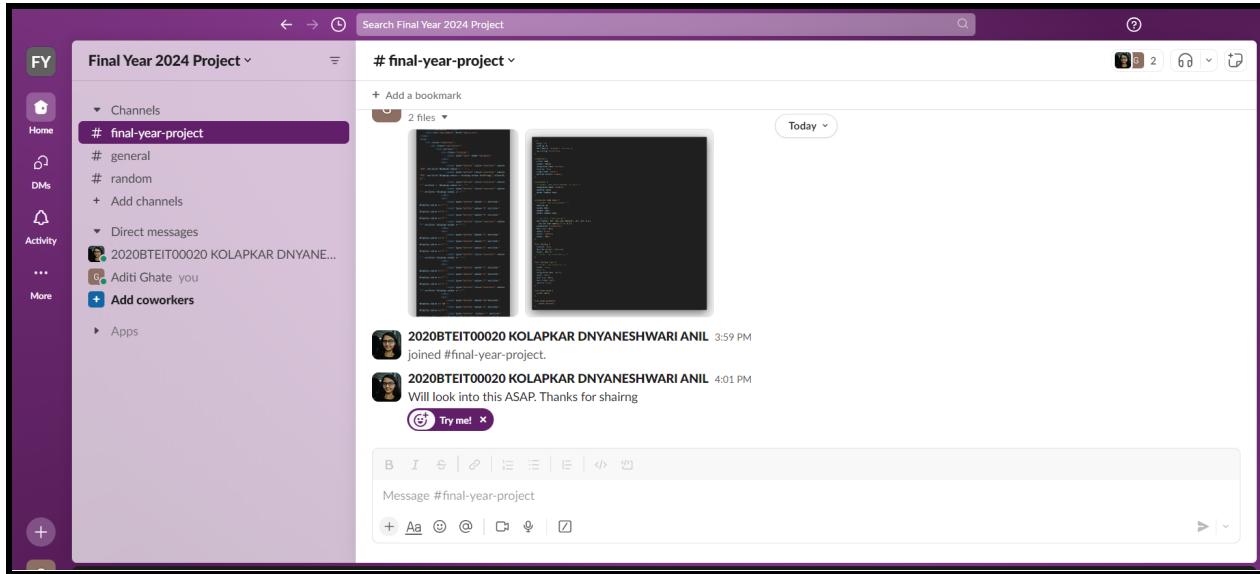
Slack is a collaboration platform for teams, featuring chat channels, direct messaging, file sharing, and extensive app integrations. It boosts productivity with customizable notifications and searchable messages, making it a popular choice for remote work. With over 10 million

users logging in daily from around the world, Slack has emerged as the unequivocal leader in communication technology, providing a platform for users to engage with colleagues.

Features:

1. **Channels**: Slack organizes conversations into channels, which can be public, private, or shared, allowing teams to discuss specific topics, projects, or departments.
2. **Direct Messaging**: Users can send one-on-one direct messages to team members for private conversations and quick communication.
3. **File Sharing**: Slack enables easy sharing of files, documents, images, and media within conversations. It also integrates with cloud storage services.
4. **Integration Hub**: It offers a wide range of integrations with third-party apps and services, connecting tools like project management, customer support, and more directly within Slack.
5. **Searchable History**: Slack retains a searchable history of messages and shared content, making it simple to find and reference past conversations.
6. **Notifications**: Users can customize notification preferences to stay informed about important messages and updates through various channels, including desktop and mobile.
7. **Video and Voice Calls**: Slack includes built-in video and voice calling features, enabling remote meetings and discussions within the platform.
8. **Workflow Automation**: Slack Workflow Builder allows users to automate tasks and processes, simplifying routine work and approvals.





```
/* margin: 0; padding: 0; font-family: "AvantGarde", sans-serif; border: none; */
```

```
.container { width: 100%; height: 100%; background-color: #000000; display: flex; align-items: center; justify-content: center; }
```

```
.calculator { /* border: 1px solid #000000; background-color: #1f4e9d; padding: 20px; border-radius: 10px; */
```

```
    .calculator-form { /* border: 1px solid purple; width: 100%; height: 100%; border-radius: 10px; */
```

```
        .calculator-form-left { /* border: 1px solid red; */
```

```
            .calculator-form-left-top { background: transparent; color: white; font-size: 40px; text-align: right; outline: none; }
```

```
            .calculator-form-left-bottom { width: 100px; }
```

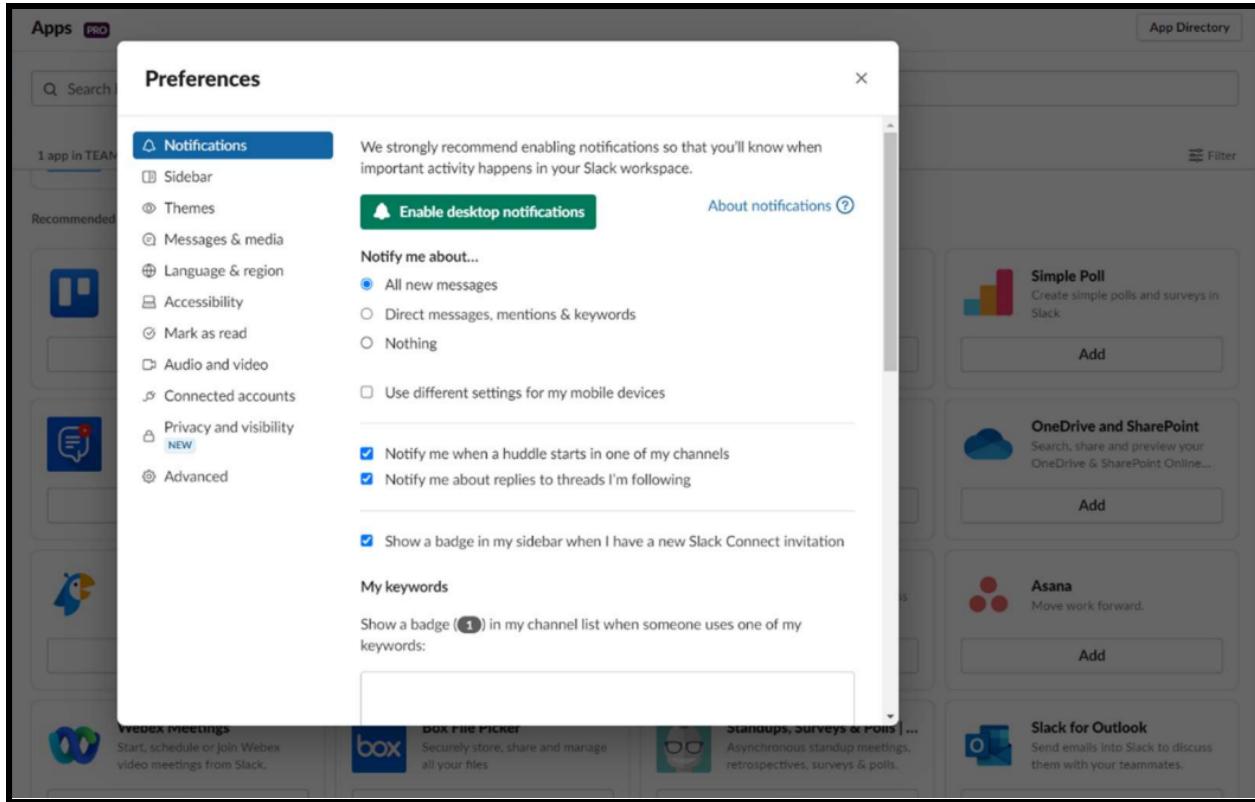
```
        .calculator-form-right { /* border: 1px solid red; */
```

```
            .calculator-form-right-top { background: transparent; color: white; font-size: 40px; text-align: left; outline: none; }
```

```
            .calculator-form-right-bottom { width: 100px; }
```

```
        .calculator-form-input { width: 100px; }
```

```
        .calculator-form-operator { color: #000000; }
```



II] Asana

Asana is similar to task and project management software. It offers teams the tools to coordinate, collaborate, plan and complete tasks. It serves as a solution for managing chaos and meeting deadlines. Asana is a web based tool that helps with task management and collaboration. It simplifies communication by organizing tasks, minimizing email overload and fostering teamwork. With Asana teams can track tasks, interact with teammates share files and achieve improved collaboration efficiency.

Features:

1. **Task and Project Management:** Asana allows teams to create and manage tasks and projects, providing a centralized location to organize and track work.
2. **Task Assignments:** Users can assign tasks to specific team members, making it clear who is responsible for each task.
3. **Task Prioritization:** Asana offers various tools for prioritizing tasks, including due dates, dependencies, and custom fields, ensuring that important work is completed on time.
4. **Project Views:** It provides multiple views of projects, such as list, board, timeline, and calendar views, giving teams flexibility in how they visualize and manage their work.

5. **Collaborative Workspaces:** Asana enables teams to collaborate in shared workspaces, where they can communicate, share files, and discuss tasks and projects.
6. **Integration with Third-Party Apps:** Asana integrates with numerous third-party applications and services, including Google Workspace, Slack, and GitHub, to streamline workflows and connect various tools.
7. **Automation:** Asana offers automation features that allow users to create custom rules and workflows to automate repetitive tasks and notifications.
8. **Reporting and Analytics:** Teams can generate reports and access analytics to gain insights into project progress, team performance, and workload distribution.

The screenshot shows the Asana web interface for a project titled "Final Year Mini Project". The left sidebar includes links for Home, My tasks, Inbox, Insights, Portfolios, Goals, Reporting, Projects, and Teams. The main workspace has tabs for Overview, List, Board, Timeline, Calendar, Workflow, Dashboard, Messages, Files, and a plus sign. A search bar at the top right shows "30 days left in trial" and "Add billing info". The "List" tab is selected, displaying a table with columns for Task name, Assignee, Due date, Priority, and Status. Tasks listed include "Synopsis" (Aditi Ghate, Tuesday, Low, On track), "Project Implementation" (Aditi Ghate, Wednesday, Medium, At risk), and "Project Report" (Aditi Ghate, Thursday, High, Off track). Below the table are sections for "Doing" (Research Paper, Technology Stack) and "Done" (Project Idea Execution).

The screenshot shows the Asana web interface with "My tasks" selected in the sidebar. The main workspace has tabs for List, Board, Calendar, and Files. A search bar at the top right shows "30 days left in trial" and "Add billing info". The "List" tab is selected, displaying a table with columns for Task name, Due date, Projects, Task visibility, and Collaborators. Tasks listed under "Recently assigned" include "Object Detection and Voice Assistance Research Paper" (Wednesday, Final Year Mini Project, Only me), "Project Implementation" (Tuesday, Final Year Mini Project, Collaborators), "Synopsis" (Tuesday, Final Year Mini Project, Only me), "First: Get started using My tasks" (Sep 11, Only me), "Second: Find the layout that's right for you" (Sep 11, Only me), "Third: Get organized with sections" (Sep 11, Only me), "Fourth: Stay on top of incoming work" (Sep 11, Only me), "Fifth: Save time by collaborating in Asana" (Sep 11, Only me), and "Sixth: Make work manageable" (Sep 11, Only me). Below the table are sections for "Do today" and "Add task...".

The screenshot shows the Asana team overview for "Aditi's First Team". The left sidebar includes sections for Home, My tasks, Inbox, Insights (Portfolios, Goals, Reporting), Projects (Final Year Mini Project), and Teams (Aditi's First Team). The main area displays team members (Aditi Ghate and Dnyaneshwari Ko...), projects (Final Year Mini Project), templates, and an "About us" section with a placeholder for team description.

The screenshot shows the Asana goal creation page for "Creating Best Foss Project". The left sidebar is identical to the previous screen. The main area shows the goal title, status (no status yet), progress bar (0% complete), and related work section. On the right, there is an "About this goal" panel showing goal owner (Arpita Khond), accountable team (walchandsangli.ac.in), time period (Q4 FY22), custom due date (No due date), and parent goals.

References:

- ⁸⁷ 1. <https://blog.hubstaff.com/slack-project-management-2/>
- ¹³ 2. <https://www.simplilearn.com/tutorials/asana-tutorial/what-is-asanaproject-management-tool>

ASSIGNMENT 03

Title - Use of Bug Tracking

Problem Statement : To install and demonstrate the use of various open source software's that are used in day to day life of software engineering.

Objectives: Students have to study at least 3 various open source tools / softwares that they use and their day to day life, with their installation and configuration on their system.

Theory- Initially introduced to the public in November 2000, MantisBT is a web-based bug tracking system that has since evolved and gained widespread popularity, solidifying its position as one of the most favored open-source bug/issue tracking solutions.

Developed in PHP, MantisBT offers compatibility with multiple database backends such as MySQL, MS SQL, and PostgreSQL. As a PHP script, it can operate on any system supported by PHP and compatible with one of the supported database management systems (DBMSes). MantisBT exhibits smooth functionality on various operating systems, including Windows, Linux, macOS, and a range of Unix systems.

Furthermore, MantisBT is featured in several Linux distributions, including Debian, Ubuntu, Fedora, Gentoo, Frugalware, and others.

Features Of Mantis

- Support for projects, sub-projects, and categories.
- User-based security for enhanced access control.
- Advanced search tools to streamline navigation.
- Comprehensive reporting and graphing functionalities.
- Support for email and RSS feeds, promoting effective communication.
- Customizable issue pages and workflow for tailored project management.
- Integration with revision control to facilitate version tracking.
- Document management capabilities for organized information handling.

System Requirements

Server Hardware Requirements

MantisBT has minimal hardware requirements, with specifications based on the server software requirements outlined in Section 2.2.2. Here are key considerations:

Server Type: MantisBT can run on either a shared public web server or a dedicated colocated box.²⁴

CPU and Memory: Sizing the server depends on web traffic, requiring consideration of CPU and memory resources typical for a web application.

Disk Space: The application code is compact, occupying less than 50 MB. Disk space for the database will vary, influenced by the chosen RDBMS, data volume, and the expected number and size of attachments.

These modest requirements make MantisBT adaptable to various hosting environments, allowing flexibility in deployment based on specific needs and usage patterns.

Server Software Requirements

The essential software for MantisBT is freely available for both commercial and non-commercial use, given its open-source nature. Refer to Section 2.2.2.1, "Versions compatibility table," for details on minimum and recommended versions.

MantisBT is versatile in terms of operating systems, running seamlessly on Windows, macOS, Linux, Solaris, the BSDs, and any system supporting the necessary server software.

Regarding web servers, MantisBT is primarily tested with Microsoft IIS and Apache but is anticipated to function with any recent web server software. Ensure your web server is configured for .php files; if using different extensions, such as .PHP3 or .PHTML, request the administrator to add support for .PHP files, as explained in the PHP documentation.

For proper functionality,²⁴ the web server must support PHP, which can be installed using CGI or any compatible integration technology. MantisBT is designed to operate in diverse environments, requiring minimal mandatory extensions. These include extensions for the utilized RDBMS (mysqli, pgsql, oci8, sqlsrv), mbstring for Unicode (UTF-8) support, and essential extensions like date, hash, json, pcre, Reflection, and session.

Optional extensions enhance specific features:

- Curl is necessary for Twitter integration.
- GD is required for the captcha feature.
- Fileinfo is crucial for file attachments and most plugins, impacting attachment previews and downloads.
- LDAP is necessary for LDAP or Active Directory authentication.
- Zlib is required to enable output compression.

Installation Requirements

MantisBT provides a high level of customization, offering configuration options through both the web interface and configuration files. Users can tailor settings globally or for specific

projects and individuals, with the exception of options listed in `$g_global_settings`. Configuration adjustments can be made in the `config_inc.php` file and within the database using various managed pages. Notably, values stored in the database take precedence over those defined in the `config_inc.php` file, allowing for flexible and project-specific configurations. To determine which value to use, MantisBT follows the list below, sequentially searching for the specified configuration option until a match is found.

- database: current user, current project
- database: current user, all projects
- database: all users, current project
- database: all users, all projects
- `config_inc.php`
- `config_defaults_inc.php`

Base Database settings:

Essential for the system's functionality, these settings are typically configured during the installation of MantisBT. Your system administrator or hosting company should provide you with the necessary information. Here are the key settings:

`$g_hostname`: Host name or connection string for the Database server. The default is localhost. For MySQL, use the format hostname or hostname:port (e.g., localhost:3306).

`$g_db_username`: User name required for connecting to the database. The user should have read/write access to the MantisBT database. The default user name is "root."

`$g_db_password`: Password associated with the specified user name. The default password is empty.

`$g_database_name`: Name of the database containing MantisBT tables. The default is 'bugtracker.'

`$g_db_type`: Supported database types include MySQL, PostgreSQL, MySQL Server, and Oracle.

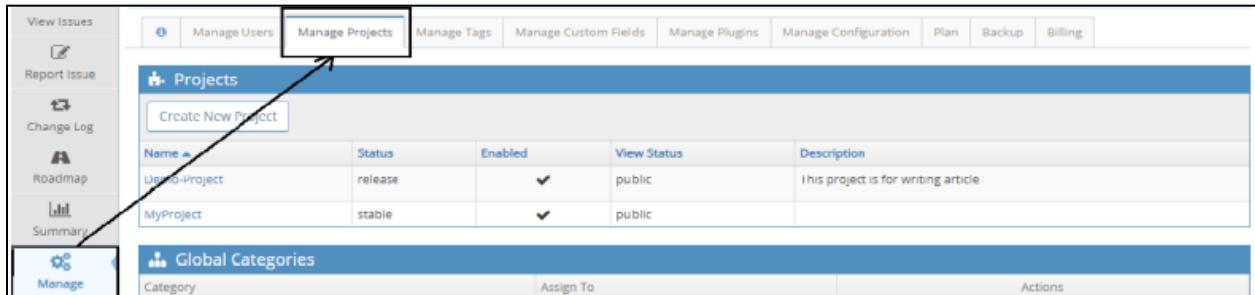
How to Use Install Tool

- The script assesses fundamental parameters for the web server.
- Supply necessary information during installation, including:
 - Database type
 - Database server hostname
 - User and password
 - Required privileges (SELECT, INSERT, UPDATE, and DELETE) for a high-privileged database account
 - Additional privileges needed (INDEX, CREATE, ALTER, and DROP)

- If no specific account is designated, the script defaults to the database user. After providing this information, click the "Install/Upgrade Database" button, initiating the script to create the necessary database and tables.
- The default Administrator user account is established for the initial login and setup of MantisBT.
- The script attempts to generate a basic config_inc.php file, specifying the database connection parameters.
- ³² If the web server's user account lacks write permissions to the directory (recommended for security reasons), the script may fail in creating the file.
- In such cases, manual creation of the config_inc.php file is necessary, involving copying and pasting content from the page.
- Subsequent to these steps, the script conducts post-installation checks on the system.
- It is crucial to thoroughly review and rectify any errors identified during this process.

How to Use Mantis Bug Tracker?

Step 1: To access the "Manage Projects" section, click on the "Manage" tab located in the left panel of the screen.



Step 2: Click the "Create project" button and fill in the required fields, including Project Name, Description, and others, to add project details.: ⁵⁸

The screenshot shows the 'Add Project' interface. At the top, there's a navigation bar with links like 'Manage Users', 'Manage Projects' (which is highlighted in blue), 'Manage Tags', 'Manage Custom Fields', 'Manage Plugins', 'Manage Configuration', 'Plan', 'Backup', and 'Billing'. Below the navigation is a form titled 'Add Project'. It contains several input fields: 'Project Name' (Demo-1), 'Status' (development), 'Inherit Global Categories' (checked), 'View Status' (public), and a large 'Description' text area containing the text 'This is for demo testing of web application'. At the bottom left is a 'Add Project' button, and at the bottom right is a note '* required'. A black arrow points from the text 'Adding all the project details' to the 'Description' text area.

Step 3: Upon entering all project details, finalize the project creation by clicking the "Add Project" button at the bottom; subsequently, the newly added project can be viewed in the "Manage -> Manage Projects" section.

The screenshot displays two main sections. On the left, the 'Projects' section shows a table with three rows: 'Demo-1' (status development, view public, description 'This is for demo testing of web application'), 'Demo-Project' (status release, view public, description 'This project is for writing article'), and 'MyProject' (status stable, view public, description empty). A callout with the text 'New Project Created' points to the second row. On the right, the 'Manage Accounts' section shows a table of users: 'administrator' (Yashi Goyal, xyz@gmail.com, access administrator, status enabled, created 2019-09-25 14:55, last visit 2019-09-25 19:32), 'Asif' (Asif, xyz@gmail.com, access reporter, status enabled, created 2019-09-25 19:20, last visit 2019-09-25 19:20), and 'full access' (Rishabh, access reporter, status enabled, created 2019-09-25 15:25, last visit 2019-09-25 15:25). The 'Manage' icon in the sidebar is highlighted with a red box, and an arrow points to the 'Manage Users' link in the top menu of the 'Manage Accounts' section.

Step 4: To provide additional details for the previously created issue, such as changing its status, consider a scenario where the tester erroneously reported a duplicate issue. In this case, the tester has the option to mark it as "Close" or "Delete" based on their assessment of the situation.

View Issue Details

Send a Reminder Jump to Notes Jump to History					
ID	Project	Category	View Status	Date Submitted	Last Update
0000002	Demo-1	[All Projects] development	public	2019-09-25 21:53	2019-09-25 21:53
Reporter	administrator	Assigned To	ananyaa		
Priority	urgent	Severity	major		
Status	assigned	Resolution	open		
Summary	0000002: Application crashes on clicking the Users tab				
Description	Steps to Reproduce: 1. Login to application with valid credentials. 2. Navigate to Home -> Users. Actual Output: On clicking the Users tab, application is crashing.				
Tags	No tags attached.				
Attach Tags	(Separate by ',')				
Release Version	1.2				
Edit Assign To Myself Change Status To: new Monitor Stock Clone Close Move Delete					

Step 5: The "Add Note" section is visible to the user, allowing the reporter or the assigned person to include additional comments or information related to the above issue.

Add Note

<input type="checkbox"/> View Status	<input type="checkbox"/> private
Note	<input type="text"/>

Step 6: The "Issue History" section is presented to enable the review of the complete history of the above issue, capturing every detail and action performed by individuals involved with the issue.

Step 7: Additionally, users can view all issues created by a specific user on their timeline, inclusive of comprehensive details, by selecting the "My View" tab.

Assigned to Me (Unresolved) (0-0/0)

Unassigned (0-0/0)

Reported by Me (1-1/1)

0000002 Application crashes on clicking the Users tab
[All Projects] development - 2019-09-25 21:53

Resolved (0-0/0)

Recently Modified (30 Days) (1-1/1)

0000002 Application crashes on clicking the Users tab
[All Projects] development - 2019-09-25 21:53

Monitored by Me (0-0/0)

Timeline

Prev 2019-09-18 2019-09-25

administrator assigned issue 0000002 to ananyaa
2019-09-25 21:53

administrator created issue 0000002
2019-09-25 21:53

View Issue Details [[Jump to Notes](#)] [[Wiki](#)] [[>>](#)] [[Issue History](#)] [[Print](#)]

ID	Project	Category	View Status	Date Submitted	Last Update
0017896	mantisbt	security	public	2014-11-18 02:52	2014-11-18 03:32
Reporter	jamesguru				
Assigned To					
Priority	immediate	Severity	crash	Reproducibility	always
Status	new	Resolution	open		
Platform	JAVA	OS	Windows	OS Version	7
Product Version	1.1.0				
Target Version	Fixed in Version				
Summary	0017896: Due to security reasons, part of your code are blocked:				
Description	Unable to import any-type of library,due to security reason				
Steps To Reproduce	Library should import and the content related to library should execute				
Tags	No tags attached.				

Various versions of MantisBT

1. MantisBT 2.25.5

This security and maintenance release addresses vulnerabilities associated with SVG file attachments (CVE-2022-33910), which are now deactivated by default. Instances with a custom \$g_disallowed_files should include "svg" in the list. Additionally, support for PHP 5.6 has been reinstated, resolving the regression introduced in version 2.25.4.

2. MantisBT 2.25.4

Maintenance release fixing a couple of regressions introduced in 2.25.3, loading a JavaScript library from CDN and initializing the path on PHP 5.6.

3. MantisBT 2.25.3

This security and maintenance release fixes vulnerabilities in CSV Export (CVE2021-43257) and Plugins management pages (CVE-2022-26144), as well as in bundled libraries GuzzleHttp/Psr7 (CVE-2022-24775) and moment.js (CVE-2022- 24785). It also addresses several PHP 8.1 compatibility issues.

Compare Tools

JIRA Vs Mantis

- ²³a) JIRA is the tracker for teams planning & building great products. Millions choose JIRA to capture & organize issues, assign work, & follow team activity.
- b) MantisBT is an open source, bug and issue tracking software written in PHP, and under GNU protocol, facilitating the collaboration of team members and clients.

	Buggit	Bugzilla	Bugtrack	Roundup	Mantis	IMS	Bugs Online
Platform	Windows 2000/XP	Linux (Fedora) ^F	Windows 2000	Linux (Fedora) ^F	Linux (Fedora) ^F	Linux (Fedora) ^F	Windows
Database	MS access	Mysql ^F	SQL server 2000	Mysql ^F	Mysql ^F	Mysql ^F	MS Access
Server (if any)		Apache ^F	IIS 5.0	Apache ^F	Apache ^F	Apache ^F	IIS 5.0
Other SW		Perl modules ^F		Python ^F	Php ^F	Php/zend optimizer ^F	
Effort to install	low	high	high	med	high	Med	med
Effort to learn and use	low	med	low	high	med	med	med
Ability to export data	Export from MSAccess	Export using PhpMyAdmin	Export from SQL Server 2000	Cannot export data	Export using PhpMyAdmin	Export using PhpMyAdmin	Export from MSAccess

Conclusion:-

Learned how to install and demonstrate the use of various open source software's like bug tracking tools (Phabricator, mantis, etc.) that are used in day to day life of software engineering.

Reference:-

<https://www.mantisbt.org/>

⁶⁷ https://www.mantisbt.org/bugs/my_view_page.php

ASSIGNMENT 04

Title- Use of version control system.

Objective- To use/experiment the online and offline version control system for foss project work.

Outcome- Lifelong learning.

About Git -

Git, a distributed version control system, is both free and open-source. It is specifically crafted to manage projects of varying sizes, ranging from small to exceptionally large, with remarkable speed and efficiency. This tool is employed for tracking changes in open-source code, facilitating collaborative efforts among multiple developers engaged in nonlinear development.

⁴ **Creator-** Linus Torvalds created Git in 2005 for the development of the Linux kernel.

Installation:

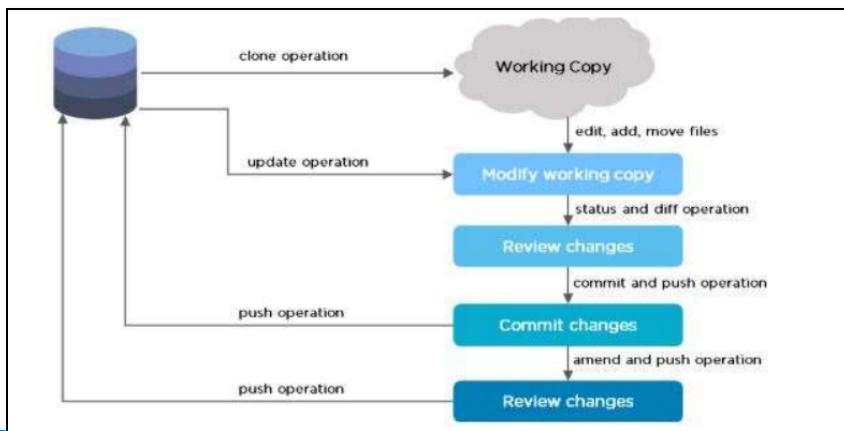
⁶² Open the terminal and write the command **sudo apt-get install git** for Linux based machines and for windows download the file from Git's official website and run it.

Features of Git-

- Tracks comprehensive project history
- Open source and free
- Enables non-linear development
- Automatic backup creation

- Scalable for diverse project sizes
- Facilitates seamless collaboration
- Simplifies branching
- Supports distributed development
- Offers fast and efficient performance
- Robust branching and merging capabilities
- Promotes data integrity with cryptographic hash functions

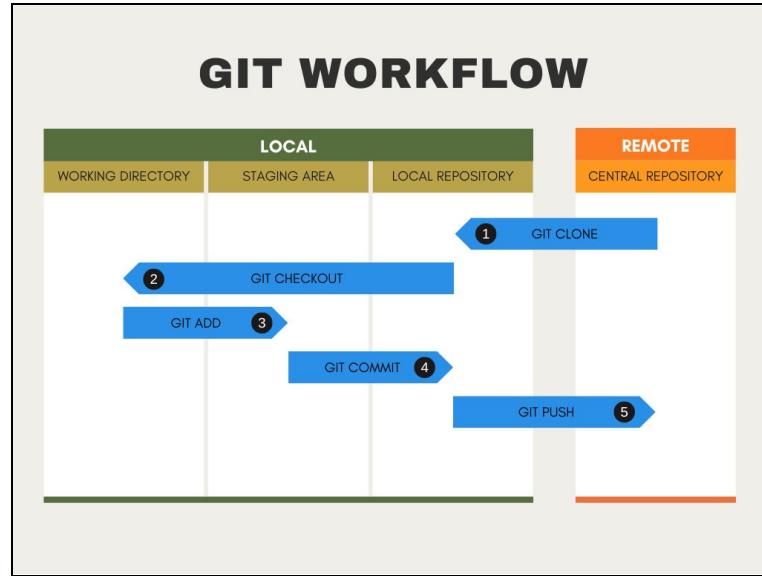
Git workflow-



6

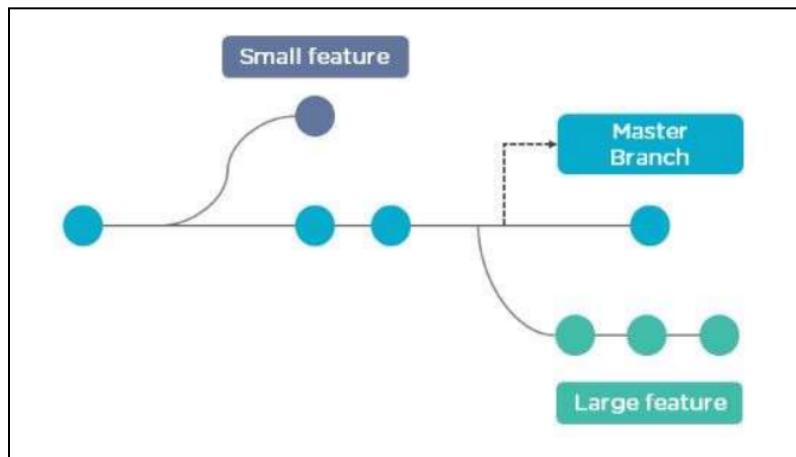
The Git workflow is divided into three states:

- Working directory - Modify files in your working directory.
- Staging area (Index) - Stage the files and add snapshots of them to your staging area.
- Git directory (Repository) - Perform a commit that stores the snapshots permanently to your Git directory. Checkout any existing version, make changes, stage them and commit.



Branch in Git-

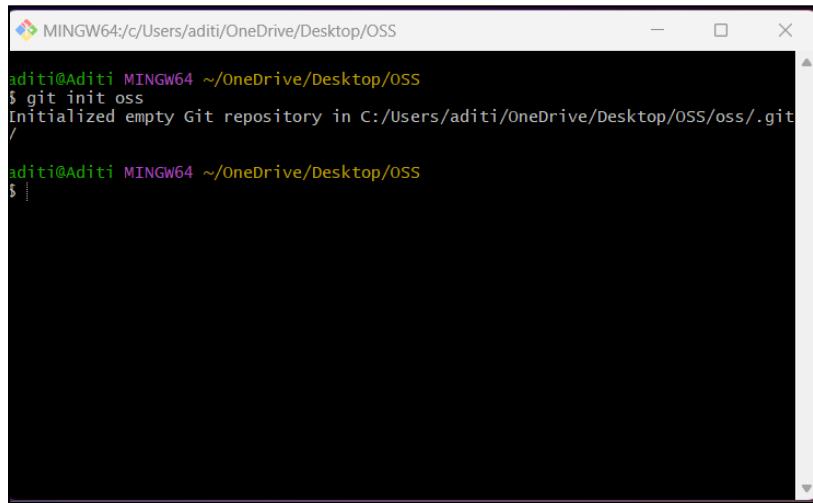
4 Branch in Git is used to keep your changes until they are ready. You can do your work on a branch while the main branch (master) remains stable. After you are done with your work, you can merge it with the main office.



The above diagram shows there is a master branch. There are two separate branches called “small feature” and “large feature.” Once you are finished working with the two separate branches, you can merge them and create a master branch.

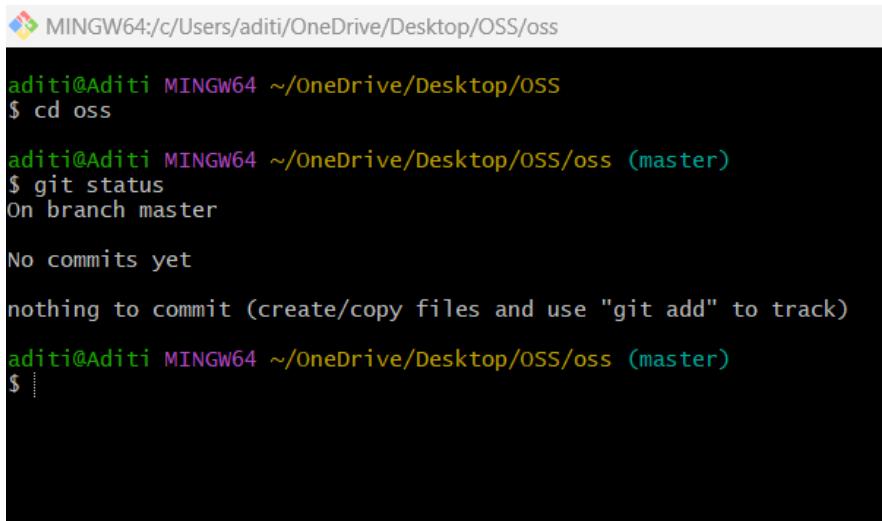
Some commands in Git-

Create Repositories- creates new git repository



```
MINGW64:/c/Users/aditi/OneDrive/Desktop/OSS
aditi@Aditi MINGW64 ~/OneDrive/Desktop/OSS
$ git init oss
Initialized empty Git repository in C:/Users/aditi/OneDrive/Desktop/OSS/oss/.git/
/
aditi@Aditi MINGW64 ~/OneDrive/Desktop/OSS
$ |
```

Check git status- Gives status of working directory and staged area.



```
MINGW64:/c/Users/aditi/OneDrive/Desktop/OSS/oss
aditi@Aditi MINGW64 ~/OneDrive/Desktop/OSS
$ cd oss

aditi@Aditi MINGW64 ~/OneDrive/Desktop/OSS/oss (master)
$ git status
On branch master

No commits yet

nothing to commit (create/copy files and use "git add" to track)

aditi@Aditi MINGW64 ~/OneDrive/Desktop/OSS/oss (master)
$ |
```

Git add command- Adds untracked files to the staged area.

```
aditi@Aditi MINGW64 ~/OneDrive/Desktop/OSS/oss (master)
$ git add assignment.txt

aditi@Aditi MINGW64 ~/OneDrive/Desktop/OSS/oss (master)
$ git status
On branch master

No commits yet

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

Git status- Commits the changes to the version control.

```
aditi@Aditi MINGW64 ~/OneDrive/Desktop/OSS/oss (master)
$ git status
On branch master

No commits yet

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

aditi@Aditi MINGW64 ~/OneDrive/Desktop/OSS/oss (master)
$ git commit -m "Initial Commit"
[master (root-commit) ae09512] Initial Commit
 1 file changed, 0 insertions(+), 0 deletions(-)
 create mode 100644 assignment.txt

aditi@Aditi MINGW64 ~/OneDrive/Desktop/OSS/oss (master)
$ |
```

```
aditi@Aditi MINGW64 ~/OneDrive/Desktop/OSS/oss (master)
$ git status
On branch master
nothing to commit, working tree clean
```

Git restore- discards the change in working directory and restores earlier changes as on the last commit.

```

aditi@Aditi MINGW64 ~/OneDrive/Desktop/OSS/oss (master)
$ git status
On branch master
nothing to commit, working tree clean

aditi@Aditi MINGW64 ~/OneDrive/Desktop/OSS/oss (master)
$ git status
On branch master
Changes not staged for commit:
  (use "git add <file>..." to update what will be committed)
    (use "git restore <file>..." to discard changes in working directory)
      modified:   assignment.txt

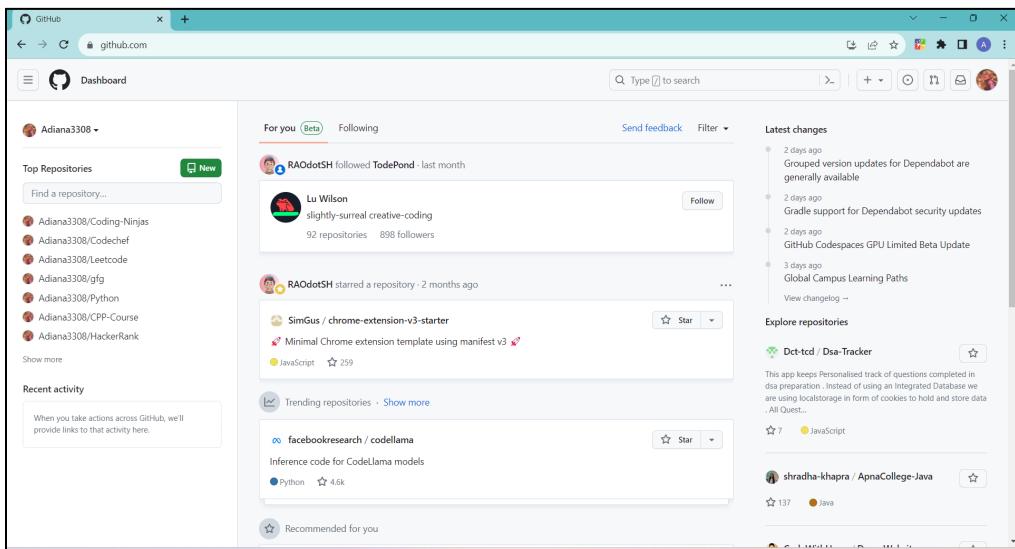
no changes added to commit (use "git add" and/or "git commit -a")

aditi@Aditi MINGW64 ~/OneDrive/Desktop/OSS/oss (master)
$ git restore assignment.txt

```

Git-hub - At a high level, GitHub is a website and cloud-based service that helps developers store and manage their code, as well as track and control changes to their code.

Home screen-



Connecting with remote repository-

```

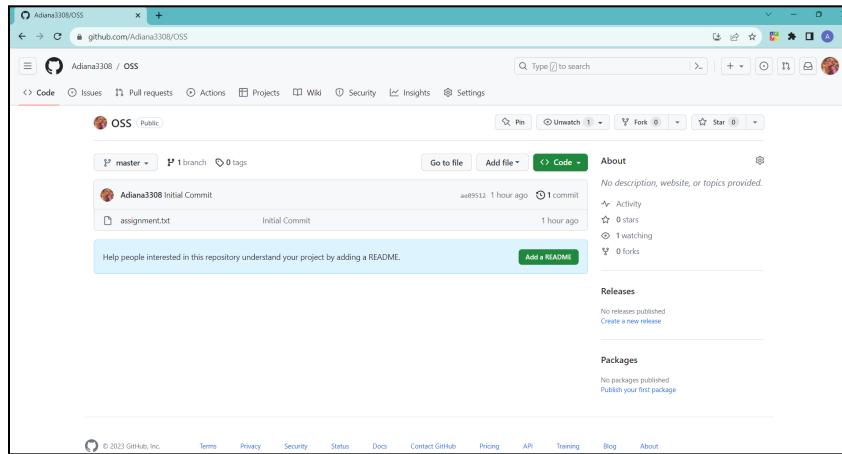
aditi@Aditi MINGW64 ~/OneDrive/Desktop/OSS/oss (master)
$ git config --global user.username Adiana3308

aditi@Aditi MINGW64 ~/OneDrive/Desktop/OSS/oss (master)
$ git remote add origin https://github.com/Adiana3308/oss.git

aditi@Aditi MINGW64 ~/OneDrive/Desktop/OSS/oss (master)
$ 

```

Check if the changes has been updated to git-hub repository-



ASSIGNMENT 05

Title- Installation and Use of CMS software (Drupal)

Objective - To comprehend the use of Content Management System and their Use for personal website/dept CMS.

Outcome- Self-learning (PO: b, I, j, k, l)

Theory -

49 A content management system (CMS) oversees the creation and modification of digital content 3 in a collaborative environment, supporting multiple users. CMS features vary widely and commonly encompass web-based publishing, format management, history editing, version control, indexing, search, and retrieval. Content management systems, by design, facilitate the separation of content and presentation. 3

Specifically tailored for managing the content of web pages, a web content management system (WCM or WCMS) is a subtype of CMS. The majority of popular CMSs also function as WCMSs, handling various types of web content, including text, embedded graphics, photos, video, audio, maps, and program code for applications that display content or interact with users. 84 Drupal is a powerful and versatile CMS that is highly customizable, making it suitable for a wide range of web projects. It has a rich history and is known for its flexibility and scalability. Its modular architecture, strong community support, and focus on security make it a popular choice for building websites and web applications, especially when flexibility and scalability are essential. 82

³ Drupal is written in PHP, uses object-oriented programming (OOP) techniques (since version 1.5) and software design patterns, stores data in a MySQL, MS SQL (since version 2.5), or PostgreSQL (since version 3.0) database. It also offers compatibility with other databases like PostgreSQL, SQLite, and Microsoft SQL Server, providing flexibility for different project requirements.

¹⁵ It includes features such as page caching, RSS feeds, printable versions of pages, news flashes, blogs, search, and support for language internationalization.

Drupal

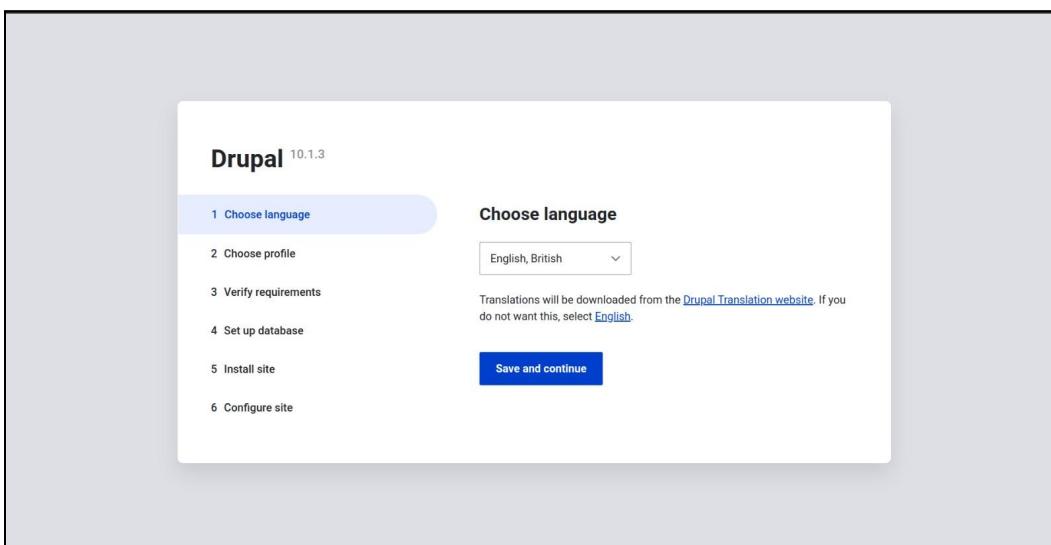
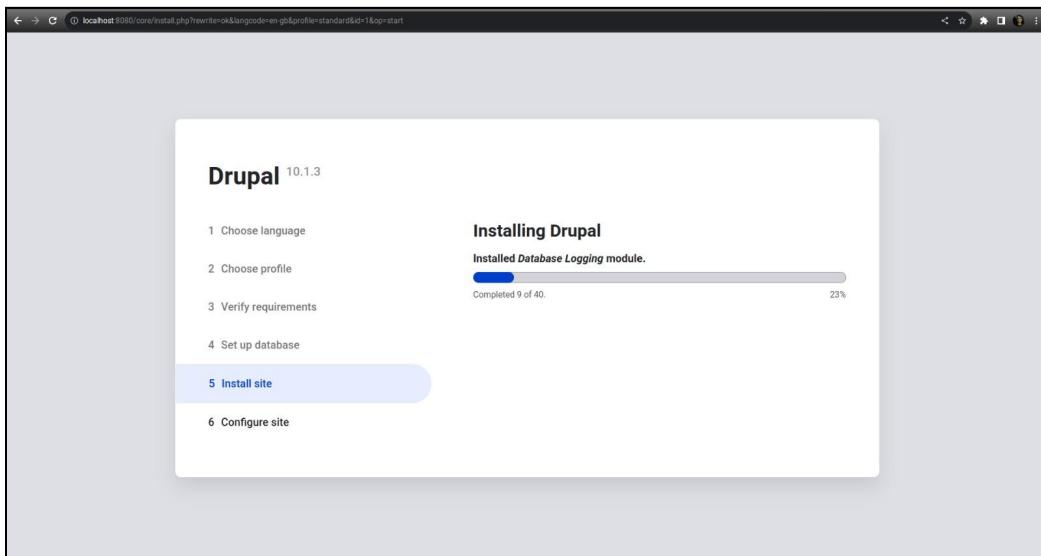
History-

Drupal originated from a project created by Belgian student Dries Buytaert in 2000. It began as a message board, was open-sourced in 2001, and officially named "Drupal." Major releases, like Drupal 8 in 2015, modernized the platform, and Drupal 9 in 2020 streamlined upgrades. Drupal 10 was under development as of my last update in September 2021.

Features-

- Content Authoring: Easily create, edit, and publish content using a flexible and intuitive authoring interface.
- User Management: Robust user authentication and permission systems with fine-grained control over user roles and permissions.
- Themes and Templates: Extensive theme and template options for creating visually appealing and responsive websites.
- Module System: A modular architecture allowing the integration of various modules for added functionality, enhancing the core capabilities.
- Custom Content Types: Define custom content types with specific fields and characteristics tailored to your site's needs.
- Taxonomy: Categorize and tag content using a flexible and customizable taxonomy system.
- Link Hub: Organize and categorize diverse resources effortlessly.
- Smart Search: Revolutionize information retrieval with advanced indexing.
- Menu Wizard: Easily create and manage menus with versatile styling options.
- Auto-Update RSS: Ensure dynamic content with automatic Really Simple Syndication (RSS) integration.

Screenshots



Advantages:-

88

- Drupal is an open-source platform, available for free.
- It's designed to be user-friendly during installation and setup, catering to both novice and advanced users. It offers a user-friendly installation wizard for quick setup.
- Drupal includes a WYSIWYG editor, making it easy for users to edit content visually.
- It places a strong emphasis on data safety and offers robust access control and permission settings. Administrators can define who can edit or modify data, ensuring data integrity.
- Drupal is designed to be compatible with all major web browsers, ensuring a consistent user experience.

- It offers flexible theming and templating options, allowing for highly customizable website designs. Drupal's theming system allows developers to create unique templates and styles.
- Media files can be easily uploaded and managed in Drupal using various media management modules and tools. Drupal's Media Library and integration with third-party media services offer flexibility in handling media.
- Drupal provides an easy-to-use menu creation tool that allows you to create and manage menus and menu items.

Disadvantages:-

- Drupal can have a steeper learning curve compared to some other CMS platforms, especially for beginners without prior experience.
- Its complexity can be overwhelming for simple websites or projects with limited resources.
- Drupal can be more resource-intensive than lighter-weight CMS options, which might lead to higher hosting costs and server requirements.
- Not all contributed modules are updated regularly, and compatibility issues can arise when using third-party modules with different Drupal versions.
- Customizing and building complex websites in Drupal can require more development time and budget compared to simpler CMS platforms.
- Finding and customizing the right theme can be challenging for non-designers or those with limited coding skills.
- Keeping Drupal and its modules up-to-date with security patches and updates can be more involved than some other CMS options.
- While Drupal has an active community, the level of community support and available resources may not be as extensive as some other CMS platforms.

Real World Examples of What Drupal Can Create?

- Corporate Websites
- Government Portals
- Educational Platforms
- Nonprofit Organizations
- E-commerce Platforms
- Media and Publishing
- Community and Social Networks
- Intranet Solutions
- Event Management
- Healthcare Platforms

Conclusion: We learned what Drupal is, its features, and how to install it.

References:

<https://www.drupal.org/project/references>

<https://en.wikipedia.org/wiki/Drupal>

ASSIGNMENT 06

Title: Ubuntu Open Source Software Development

Problem Statement: Comprehend the Open Source Software Development for Ubuntu or Debian.

Community Name: ***Ubuntu Community***

Website: <http://www.ubuntu.com/community/>²⁸

Mailing List: <https://lists.ubuntu.com/>

Wiki: <https://wiki.ubuntu.com/>

Version Control: <https://code.launchpad.net/ubuntu>

Bug Tracking: <https://bugs.launchpad.net/ubuntu>⁸⁹

Documentation: <https://help.ubuntu.com/community>

IRC Channels: <https://wiki.ubuntu.com/IRC/ChannelList>

Localization: <https://translations.launchpad.net/ubuntu>

Introduction:

⁷⁸Ubuntu is one of the most popular Linux distributions, known for its user-friendliness and strong community support. Its open source development process is a collaborative effort that involves numerous individuals and organizations worldwide. Below is a breakdown of the key components of Ubuntu's open source development ecosystem:

1. Development Community:

- Ubuntu's development community is a diverse group of contributors, including developers, testers, documentation writers, and more.
- The community is united by a common goal: to create a user-friendly and reliable Linux distribution.

2. Website:

- The official Ubuntu website provides a hub for users and developers to access information, support, and resources related to Ubuntu.

- It serves as a gateway for users to download the latest Ubuntu releases and explore documentation.

3. Mailing List:

- The Ubuntu mailing list is a crucial communication channel where developers and users discuss various aspects of the distribution.
- It's a place to seek help, report issues, and engage in development-related discussions.

4. Wikipedia:

- Ubuntu's wiki is a valuable resource containing documentation, guides, and tutorials for users and developers.
- It's a collaborative platform where community members contribute knowledge and share expertise.

5. Version Control:

- Ubuntu's version control is managed through Launchpad, a web-based platform.
- Developers use Launchpad to host source code, track changes, and coordinate development efforts.

6. Bug Tracking:

- Launchpad is also used for bug tracking in Ubuntu.
- Users and developers report issues, and the bug tracking system helps prioritize and address them efficiently.

7. Documentation:

- Ubuntu's documentation provides comprehensive guides and manuals to help users make the most of their Ubuntu experience.
- It covers installation, configuration, troubleshooting, and more.

8. IRC Channels:

- Ubuntu maintains a wide range of IRC (Internet Relay Chat) channels for real-time communication.
- Users and developers can join channels to get immediate assistance or engage in discussions.

9. Localization:

- Ubuntu is a global project, and localization efforts ensure that the distribution is available in multiple languages.
- Translators work on making Ubuntu accessible to a diverse international audience.

Ubuntu's open source development process is a testament to the power of collaboration within the open source community. It combines technical expertise, user feedback, and a commitment to open principles to continuously improve and evolve the Ubuntu distribution for users worldwide.

ASSIGNMENT 07

Title- Compilation of Linux Kernel

Problem Statement - Compilation of Linux Kernel. (Debian or ubuntu)

Objectives - To demonstrate how to compile Linux Kernel.

What is a Kernel?

A²⁶ kernel is the core component of an operating system that manages system resources, provides essential services, and acts as an intermediary between software applications and the computer's hardware.

Configuring Grub

Grub should have enough timeout so that we can choose another kernel if kernel installation fails.

To change the grub timeout, open the grub config file in nano as root by giving the below command in terminal.

```
93 sudo nano /etc/default/grub
```

Comment these lines, by inserting "#" at the beginning of the lines. After commenting, the lines should look like below.

```
55 #GRUB_HIDDEN_TIMEOUT=0  
# GRUB_HIDDEN_TIMEOUT_QUIET=true
```

"**GRUB_TIMEOUT**" property should not be commented on. To increase the grub timeout to 10 seconds, change this line as below.

```
GRUB_TIMEOUT=10
```

```

GRUB_DEFAULT=0
GRUB_HIDDEN_TIMEOUT=0
GRUB_HIDDEN_TIMEOUT_QUIET=1
GRUB_DISTRIBUTOR='lsb_release -i -s > /dev/null || echo Debian'
GRUB_CMDLINE_LINUX_DEFAULT='quiet'
GRUB_CMDLINE_LINUX='quiet splash auto noprompt priority=critical locale=en_US'

# Uncomment to enable Badram filtering, modify to suit your needs
# the memory map information from GRUB (GNU Mach, kernel of FreeBSD ...)
#GRUB_BADRAM='0x01234567,0xfffffff0,0x89abcd,0xefefefef'

# Uncomment to disable graphical terminal (grub-pc only)
#GRUB_TERMINAL=console

# The resolution used on graphical terminal
# note that you can use only modes which your graphic card supports via VBE
# you can see them in real GRUB with the command 'vbeinfo'
#GRUB_GFXMODE=40x40

# Uncomment if you don't want GRUB to pass "root=UUID=xxxx" parameter to Linux
#GRUB_DISABLE_LINUX_UUID=true

# Uncomment to disable generation of recovery mode menu entries
#GRUB_DISABLE_RECOVERY=true

# Uncomment to get a beep at grub start
#GRUB_INIT_TUNE= 489 440 1

```

45 Press (**Ctrl+O**) to save the file and then press (**Ctrl+X**) to exit out of **nano**.
As the changes have been made to GRUB config, it is needed to update our grub by giving the below command.

```
sudo update-grub
```

```

To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

It@ubuntu:~$ sudo nano /etc/default/grub
It@ubuntu:~$ sudo update-grub
Sourcing file /etc/default/grub...
Generating grub configuration file ...
Found linux image: /boot/vmlinuz-5.15.0-46-generic
Found initrd image: /boot/initrd.img-5.15.0-46-generic
Found linux image: /boot/vmlinuz-5.11.0-27-generic
Found initrd image: /boot/initrd.img-5.11.0-27-generic
Found memtest80+ image: /boot/memtest80+.elf
Found memtest80+ image: /boot/memtest80+.bin
done
It@ubuntu:~$ 

```

Check Current Kernel Version

```

Activities Terminal Aug 27 07:42
Ubuntu:~ it@ubuntu:~ To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

[1] 1188 pts/0 0:00 -> update-grub
[sudo] password for it:
[sudo] password for it:
sourcing file '/etc/default/grub'
Generating grub configuration file ...
Found linux image: /boot/vmlinuz-5.11.0-27-generic
Found initrd image: /boot/initrd.img-5.11.0-27-generic
Found nentest80+ image: /boot/nentest80+.elf
Found nentest80+ image: /boot/nentest80+.bin
it@ubuntu:~$ uname
Linux
it@ubuntu:~$ uname -r
5.15.0-46-generic
it@ubuntu:~$ 

```

Downloading The Kernel Source

Download the stable Linux kernel source code by visiting the website [Kernel.org](https://www.kernel.org/).

The Linux Kernel Archives

About Contact us FAQ Releases Signatures Site news

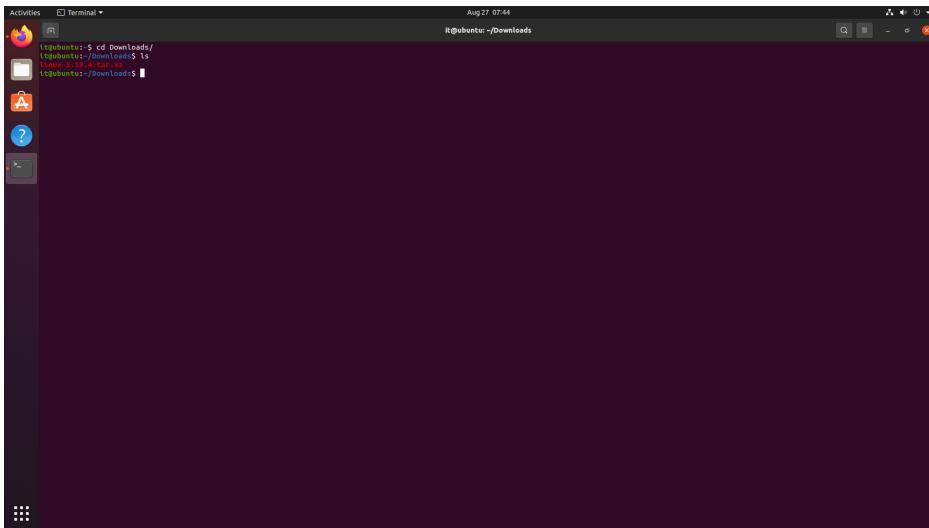
Latest Release
6.5.3

Protocol	Location
HTTP	https://www.kernel.org/pub/
GIT	https://git.kernel.org/
RSYNC	rsync://rsync.kernel.org/pub/

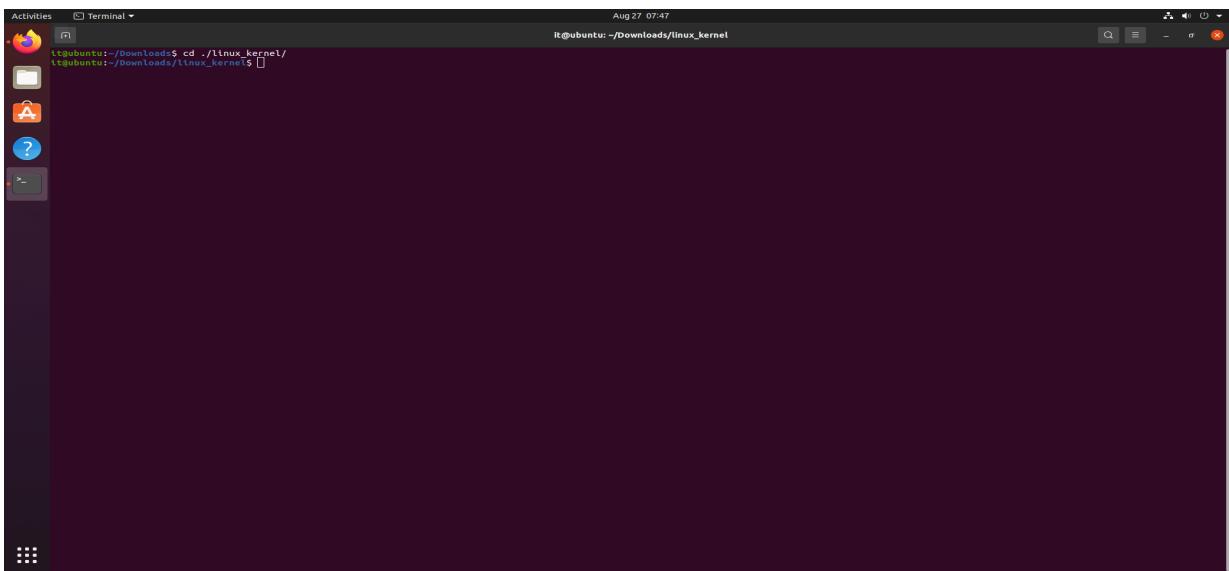
Protocol Location

Protocol	Location
mainline:	6.6-rc1 2023-09-10 [tarball] [patch] [view diff] [browse]
stable:	6.5.3 2023-09-13 [tarball] [pgp] [patch] [inc. patch] [view diff] [browse] [changelog]
stable:	6.4.16 [EOL] 2023-09-13 [tarball] [pgp] [patch] [inc. patch] [view diff] [browse] [changelog]
longterm:	6.1.53 2023-09-13 [tarball] [pgp] [patch] [inc. patch] [view diff] [browse] [changelog]
longterm:	5.15.131 2023-09-06 [tarball] [pgp] [patch] [inc. patch] [view diff] [browse] [changelog]
longterm:	5.10.194 2023-09-02 [tarball] [pgp] [patch] [inc. patch] [view diff] [browse] [changelog]
longterm:	5.4.256 2023-09-02 [tarball] [pgp] [patch] [inc. patch] [view diff] [browse] [changelog]
longterm:	4.19.294 2023-09-02 [tarball] [pgp] [patch] [inc. patch] [view diff] [browse] [changelog]
longterm:	4.14.325 2023-09-02 [tarball] [pgp] [patch] [inc. patch] [view diff] [browse] [changelog]
linux-next:	next-20230915 2023-09-15 [tarball] [patch] [view diff] [browse]

Once you have chosen the kernel version that you want to download. Click on the link that says "[tarball]". Now the download should start and hopefully you will be downloading a file that ends with either ".tar.gz" or ".tar.xz". After the downloading has been completed, run the below command to extract the downloaded file. Note: While extracting if you don't want the terminal to output file names you can replace the "xvf" in the below command with "xf". By doing that; the extraction will be a bit faster.

A screenshot of an Ubuntu desktop environment. A terminal window titled "Terminal" is open in the foreground, showing the command line. The terminal window has a dark background and white text. The desktop background is also dark. On the left side, there is a vertical dock with icons for various applications like a browser, file manager, and system settings.

```
mkdir "linux_kernel"  
tar xvf linux-* -C linux_kernel/ --strip-components=1
```

A screenshot of an Ubuntu desktop environment. A terminal window titled "Terminal" is open in the foreground, showing the command line. The terminal window has a dark background and white text. The desktop background is dark. On the left side, there is a vertical dock with icons for various applications like a browser, file manager, and system settings.

And then, change into the extracted directory by running the command:

```
cd ./linux_kernel/
```

Configuring The Downloaded Kernel

Before compiling the kernel source, it's crucial to set up a configuration file dictating features and drivers. Two methods exist: use the distribution's pre-configured file (suitable for frequent hardware changes) or generate a new one based on connected devices. Note that using the distribution's file may result in a longer compilation time and a larger kernel. If new devices are connected with a new config file, kernel recompilation is necessary. Choose based on hardware needs and preferences.

Note: Use the config file that came with your distribution, if you frequently connect new hardware to your Linux machine.

The config file that came with your distro already has around 4000 different kernel modules and drivers for supporting different hardware you may connect to your machine. In-case you generate a new config file and try to connect new devices, you will need to re-create the config file and then re-compile the kernel.

Note: The kernel compilation time with the config file from your distro will take much longer and will result in a heavier kernel.

1. Use The Configuration File That Came With Your Distro

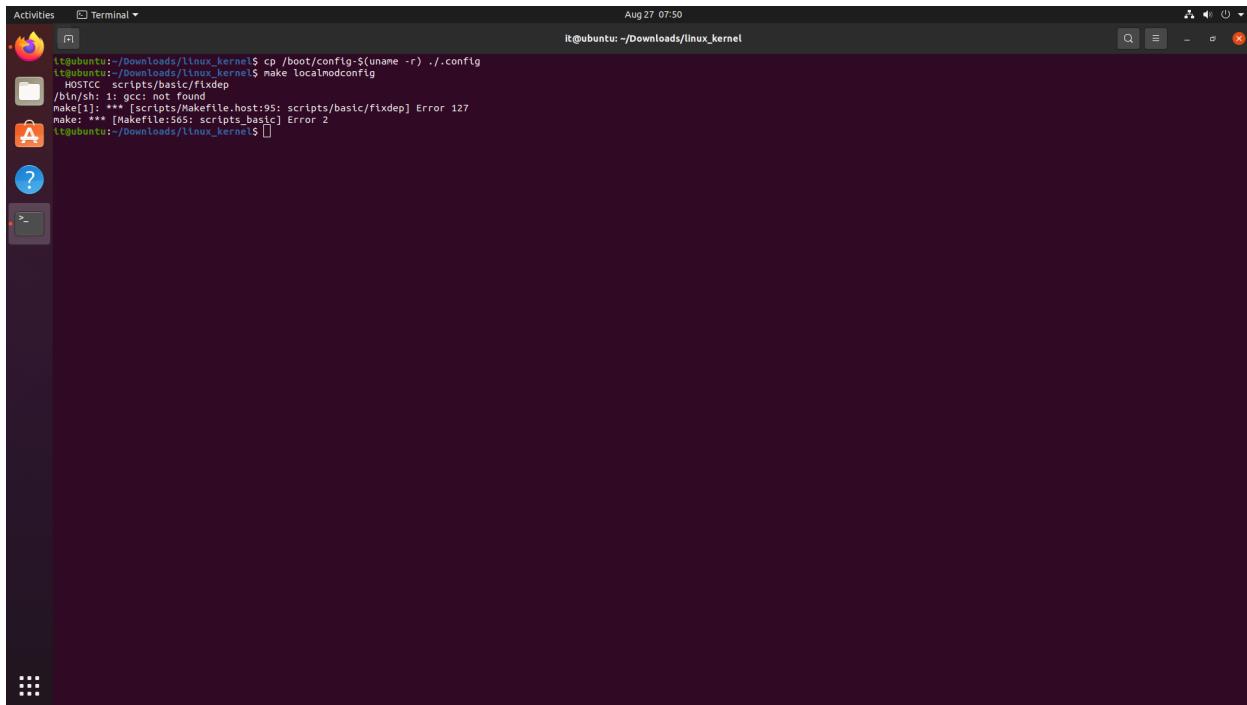
In this tutorial, I will use the config file that came with my Ubuntu Linux. To copy the config file from your distro, enter the following command:

```
cp /boot/config-$(uname -r) ./config
```

2. Generate A Configuration File Based On Connected Devices

If you want to use the second method, which will generate the config file based on the currently connected devices and on your hardware configuration, enter the following command.

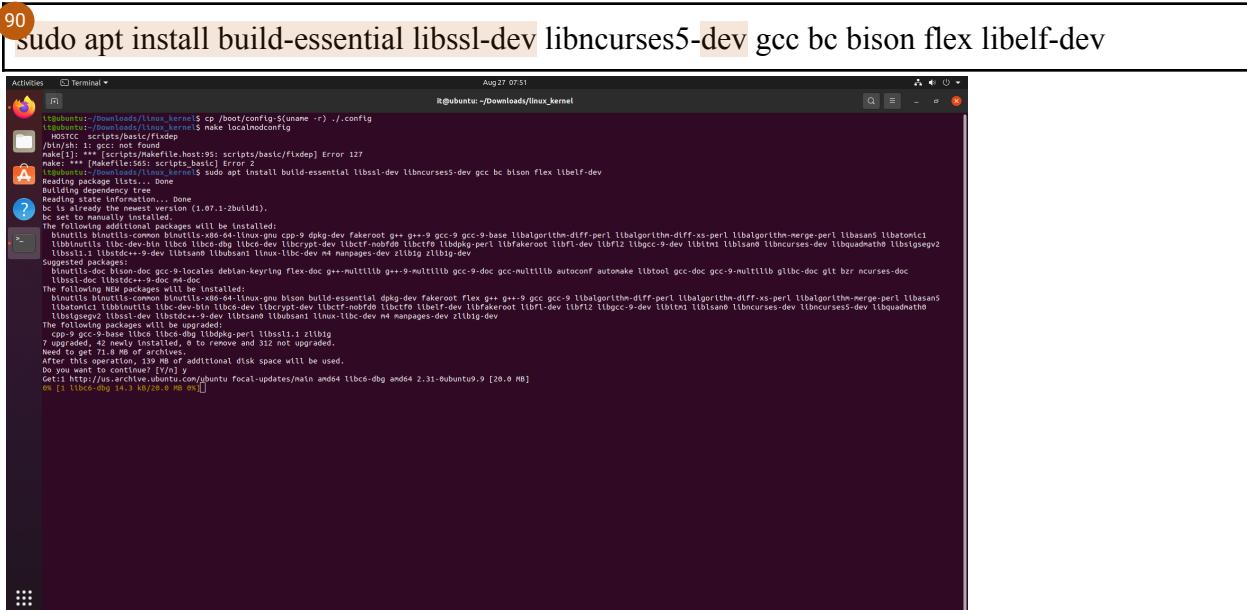
```
make localmodconfig
```

A screenshot of an Ubuntu desktop environment. A terminal window titled "Terminal" is open at the bottom of the screen, showing command-line output. The background shows the Unity interface with its characteristic docked application icons.

You will be asked some questions about whether to include some new features that the kernel provides. Press the enter key until all the questions are over otherwise. If you know what you are doing; you can take time to answer each question.

Setting Up The Environment

Run the below command to install all the required dependency packages, for a successful compilation.

A screenshot of a terminal window on an Ubuntu system. The title bar says "Terminal". The command "sudo apt install build-essential libssl-dev libncurses5-dev gcc bc bison flex libelf-dev" is being typed into the terminal. The terminal shows the progress of the package installation, including dependency resolution and upgrade information. The output includes messages like "Reading package lists... Done", "Building dependency tree", and "The following NEW packages will be installed: ...". It also lists several packages being upgraded, such as "libelf1", "libelf-dev", "libelf1", "libelf1", and "libelf1". The terminal ends with a prompt asking if the user wants to continue ("Do you want to continue? [Y/n] y").

Note: The dependencies may change over time. Also, the names of some packages defer from distribution to distribution, so please use other websites like StackOverflow to troubleshoot any compilation problems.

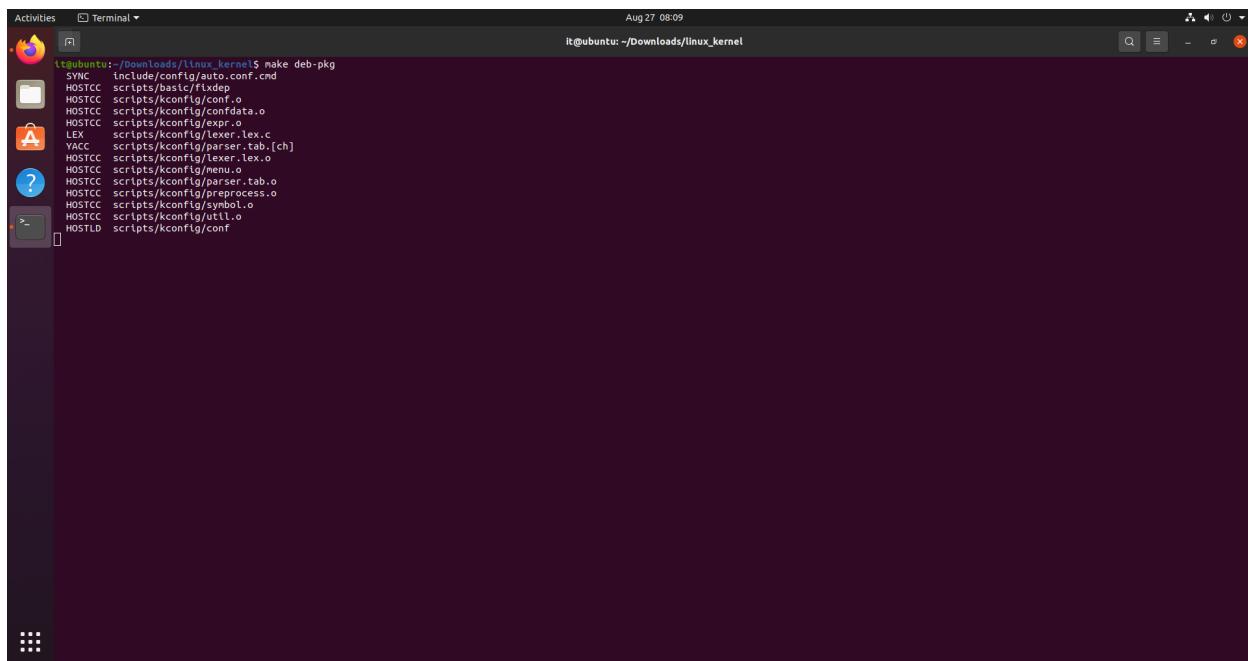
Before we start the compilation process, ensure screensaver and auto-sleep are disabled, as they would interrupt the compilation process.

Compiling The Linux Kernel

With everything configured, it's time to compile the Linux kernel. Given that the compilation process is time-consuming, you can choose between running it on a single core or distributing the task across all available cores in your processor. To initiate the compilation process, execute the command below in the terminal, replacing "[x]" with the number of cores your processor possesses.

```
make -j[x] deb-pkg
```

Note: While it's recommended to run the compilation process using a single core for better quality, it does take more time. Utilizing more than one core can speed up the compilation but may compromise the quality. To initiate the compilation process using a single core, execute the command below in the terminal.



A screenshot of a Linux desktop environment showing a terminal window. The terminal window has a dark background and contains the following text:

```
lts@ubuntu: ~/Downloads/linux_kernel$ make deb-pkg
SYNC  include/config/auto.conf.cnd
HOSTCC scripts/basic/fldexp
HOSTCC scripts/kconfig/conf.o
HOSTCC scripts/kconfig/distro.o
HOSTCC scripts/kconfig/expr.o
LEX   scripts/kconfig/lexer.lex.c
YACC  scripts/kconfig/parser.tab.[ch]
HOSTCC scripts/kconfig/lexer.lex.o
HOSTCC scripts/kconfig/menu.o
HOSTCC scripts/kconfig/menuselect.tab.o
HOSTCC scripts/kconfig/printprocess.o
HOSTCC scripts/kconfig/symbol.o
HOSTCC scripts/kconfig/util.o
HOSTLD scripts/kconfig/conf.f
```

Keep pressing enter key for all the prompts asking to enable new features. Depending upon your computer's horsepower; compilation process may take anywhere from minutes to days. Do not interrupt the compilation process, otherwise you will have to start from the beginning.

Installing The Compiled Kernel

Once the compilation process has been completed successfully without any errors, you will find some deb packages in the parent directory. Now you can distribute these deb packages as a compiled kernel. I recommend you to first try installing on a virtual machine and test the kernel and see if everything works fine.

After ensuring the compiled deb packages work as expected, you can install them by running the following command.

```
cd .. / sudo dpkg -i linux-*.deb
```

The installation will take a few minutes. Finally reboot your Linux machine and enjoy your new kernel.

Conclusion

Compiling a kernel is a task typically undertaken by developers, as it involves a level of complexity. Various forums provide assistance in case issues arise during the process.

ASSIGNMENT 08

Title:- Create of RPM or DEB packages

Objective :- To Create package building process in Linux

Theory (Functions of tool /How to Use /Drawbacks)

A Debian package, denoted by the .deb file extension, encompasses executable files, libraries, and documentation associated with a specific suite of programs or a related set. Illustrated with the GNU hello program, which delivers a friendly greeting, it serves as an example of creating a Debian package. The Package field specifies the package name, while the Version field includes the upstream developer's version number. The Architecture field designates the chip for which the binary was compiled. The Depends field lists required packages for successful installation. Installed-Size indicates the disk space the package will occupy. The Section line denotes where the Debian package is stored in Debian FTP sites. Priority reflects the package's importance for installation, aiding sorting by software like `deselect` or `aptitude`. The Maintainer field provides the current maintainer's email address, and the Description field offers a concise summary of the

package's features.

Steps:-

```
#include  
56 using namespace std;  
int main( )  
{  
    cout<<"Hello World";  
    return 0;  
}
```

Save the above code as helloworld.cc. At this point make sure that you have compiler installed on your system by executing:

```
$ sudo apt-get install build-essential
```

Compile and execute your code with a following command:

```
1. $ g++ helloworld.cc -o helloworld  
2. $ ./helloworld
```

At this juncture, you should possess a binary executable named "linuxconfig," capable of displaying specific strings on the screen. Now, to package it into a Debian package, you'll employ the dpkg-deb tool. However, before doing so, it's essential to establish a Debian package structure, with the only mandatory files being:

1. DEBIAN/control
2. Custom files (optional) to be included in the package

Begin by creating a directory named "Calc." This directory will serve as the container for all essential package files:

```
$ mkdir helloworld
```

Next, create a control file:

```
1.$ cd helloworld  
2.$ mkdir DEBIAN
```

When ready open up DEBIAN/control file

\$ vi DEBIAN/control and enter a following information:

```
Package: helloworld
Version: 1.0
Section: custom
Priority: optional
Architecture: all
Essential: no
Installed-Size: 1024
Maintainer: helloworld.org
Description: Display String.
```

Still in the root of the helloworld directory create a directory which will be used to install the hello world program and copy program into this directory. Best choice for us will be /usr/bin:

```
1.$ mkdir -p /usr/bin/
2.$ cp /home/sdk/helloworld /usr/bin/
```

At this point we are ready to create a debian package.

```
$ cd ..
$ dpkg-deb --build helloworld dpkg-deb: building package 'helloworld' in 'helloworld.deb'.
$ ls helloworld.helloworld.deb
```

To install file:

```
$ sudo apt-get install helloworld
```

Conclusion:-

- 1) We Learned about RPM and DEB.
- 2) We Build our own debian package.
- 3) We have studied how to build debian packages.

Reference:-

<http://linuxconfig.org/>
<http://askubuntu.com/questions/90764/>
<https://www.youtube.com/watc>

ASSIGNMENT 09

Title: Install and demonstrate various Server based services and their Uses.

Objective: - To know server installations and Configurations on Linux Platform

Instruction for the Assignment: Students are asked to install and configure at least 2 servers, such as FTP, HTTP, TELNET, NFS,NIS etc.All configurations must be done on Linux Platform

Theory (Functions of tool /How to Use /Drawbacks):

The File Transfer Protocol (FTP) is a standard system convention facilitating the exchange of computer files between hosts over a TCP-based network, such as the Internet. It follows a client-server model, utilizing separate control and data connections.

The Hypertext Transfer Protocol (HTTP) is an application protocol fundamental to the World Wide Web facilitating collaborative, hypermedia information frameworks. It serves as the foundation for data communication on the internet.

Telnet (Terminal Network) is an internet or local area network protocol providing bidirectional interactive text-oriented communication through a virtual terminal connection.

The Network Information Service (NIS), originally known as Yellow Pages (YP), operates as a client-server directory service protocol, distributing system configuration data like user and host names among computers on a network.

Network File System (NFS) is a distributed file system protocol initially developed by Sun Microsystems in 1984. It enables a user on a client computer to access files over a network, resembling local storage. NFS utilizes the Open Network Computing Remote Procedure Call (ONC RPC) system, much like several other protocols.

Main Functions

The primary function of a computer server is to store, retrieve, and transmit, or "serve," files and data to other computers within its network. Various organizations, regardless of size, utilize local networks or "intranets" within their office spaces. On a global scale, the broader computer network we recognize as the "Internet" relies on a multitude of websites. The files, data, and functionality of each website are contingent on web servers.

Steps:

1. FTP server:

To ³⁹install VSFTPD

sudo apt-get install vsftpd

To open vsftpd.conf file.

sudo gedit /etc/vsftpd.conf Edit the 3 lines and save the file ⁸⁵anonymous enable=YES

local enable=YES

write enable=YES

Restart the server

sudo service vsftpd restart

Open FTP from the browser. -ftp://10.10.13.13(IP)

2. HTTP server:

\$ sudo apt-get install apache2

Now type "<http://local-host>" in browser

If "it works" message occurs then it means apache is in- stalled

3. NIS server:

To install nis

sudo apt-get install nis

To open nis file

sudo gedit /etc/defaults/nis Edit the line and save the file NISERVER= master

To open makefile file.

sudo gedit /var/yp/makefile

Add the line and save the file

⁶⁰ALL = passwd shadow group hosts rpc services netid protocols netgrp

update NIS database

/usr/lib/yp/ypinit -m

To start server

service ypserv start

4. Telnet:

⁴¹\$ sudo apt-get install telnetd

Restart inetd service:

\$ sudo /etc/init.d/openbsd-inetd restart

connect to telnet server from any other computer machine
\$ telnet (IP)10.10.13.13

5. *NFS server:*

63 To install nfs.

sudo apt-get install nfs-kernel-server

To open idmapd.conf file.

sudo gedit /etc/idmapd.conf

Uncomment and change to your domain name

Domain = ravi.itdept

To start service

sudo initctl restart idmapd

Mount the directory.

sudo mount -t nfs ram.itdept:/home /home

Change home directory this server mounts to the one on NFS in
ram.itdept:/home /home nfs defaults 0 0

Screenshots:

The image shows two side-by-side terminal windows. The left window displays the command 'sudo status vsftpd' followed by the output 'vsftpd start/running, process 4977'. The right window shows the command 'sudo apt-get install vsftpd' followed by a detailed log of the package installation process, including dependency resolution and file extraction.

```
aditya@aditya-HP-Notebook: ~
File Edit View Search Terminal Help
aditya@aditya-HP-Notebook:~$ sudo status vsftpd
vsftpd start/running, process 4977
aditya@aditya-HP-Notebook:~$ 

aditya@aditya-HP-Notebook: ~
File Edit View Search Terminal Help
aditya@aditya-HP-Notebook:~$ sudo apt-get install vsftpd
[sudo] password for aditya:
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following packages were automatically installed and are no longer required:
  linux-headers-4.4.0-31 linux-headers-4.4.0-31-generic
    linux-image-4.4.0-31-generic linux-image-extra-4.4.0-31-generic
Use 'apt-get autoremove' to remove them.
The following NEW packages will be installed:
  vsftpd
0 upgraded, 1 newly installed, 0 to remove and 2 not upgraded.
Need to get 111 kB of archives.
After this operation, 361 kB of additional disk space will be used.
Get:1 http://in.archive.ubuntu.com/ubuntu/ trusty-updates/main vsftpd amd64 3.0.2-1ubuntu2.14.04.1 [111 kB]
Fetched 111 kB in 2s (40.5 kB/s)
Preconfiguring packages ...
Selecting previously unselected package vsftpd.
(Reading database ... 218159 files and directories currently installed.)
Preparing to unpack .../vsftpd_3.0.2-1ubuntu2.14.04.1_amd64.deb ...
Unpacking vsftpd (3.0.2-1ubuntu2.14.04.1) ...
Processing triggers for man-db (2.6.7.1-1ubuntu1) ...
Processing triggers for ureadahead (0.100.0-16) ...
```

ASSIGNMENT 10

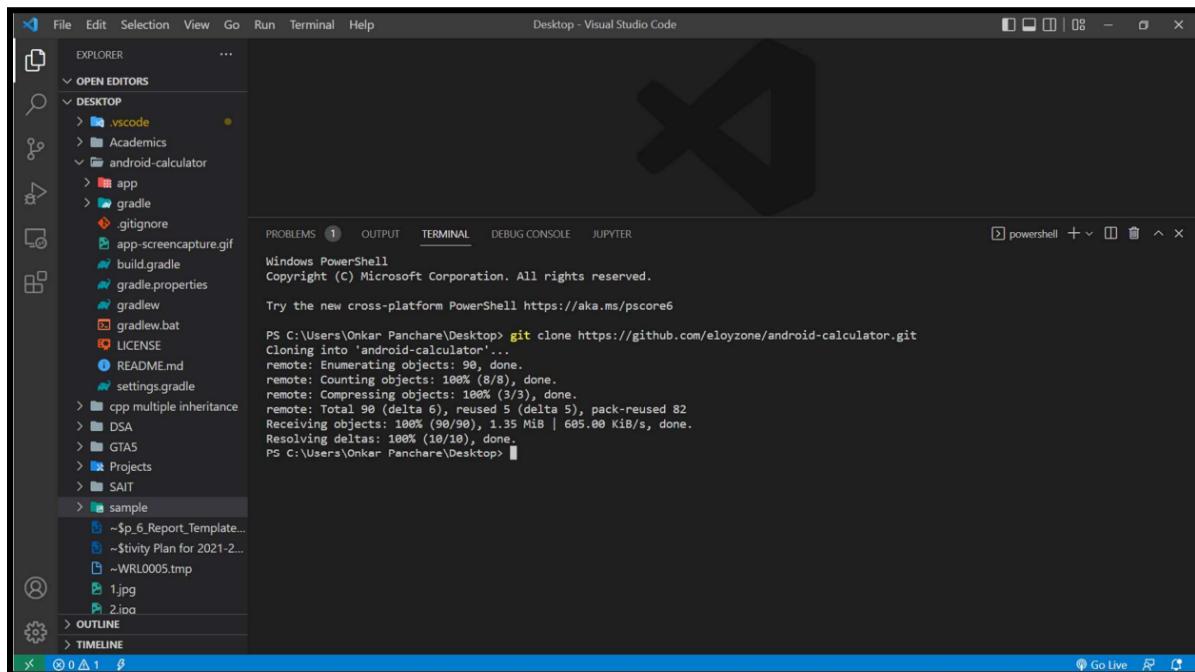
Title:- Development of new OSS or contribution to existing OSS (Music player or calculator)

Problem statement – To contribute to an existing open-source software or create a new OSS

Objective –

1. To learn how to create OSS
2. Contribute to an existing OSS

Forking the repository: For this assignment, the existing repository has been cloned to make changes. The repository is an android based calculator where the developer has developed a simple calculator which performs binary operations like addition, subtraction, multiplication and division.



Scope of improvement:

The calculator performs some basic operations and more buttons can be added on the keyboard.

The screenshot shows the Android Studio interface. The left pane displays the project structure for the 'android-calculator' project, specifically the 'app' module. The right pane has two sections: the top section shows the XML code for 'activity_main.xml', and the bottom section shows the visual representation of the calculator's user interface. The UI consists of a black background with white text and icons. It includes a numeric keypad (0-9), arithmetic operators (+, -, ×, ÷, =), and various function keys like C, (), %, and square root.

```

<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/apk/res-auto"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical"
    android:layout_marginTop="0.5dp"
    tools:context=".MainActivity">

    <LinearLayout
        android:layout_marginTop="0.1dp"
        android:layout_marginLeft="0.9dp"
        android:layout_marginRight="0.1dp"
        android:background="#android:color/black"
        android:layout_width="match_parent"
        android:layout_height="0dp"
        android:layout_weight="3">

        <TextView
            android:id="@+id/textView_input_numbers"
            android:layout_marginTop="25dp"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:layout_marginRight="10dp"
            android:gravity="end"
            android:textColor="#android:color/holo_red_light"
            android:textSize="40sp" />
    
```

Changes in the code-

Functionality of multiplicative inverse, finding square, square root and absolute value has been added and the bugs of dependencies have been resolved.

This screenshot is similar to the one above but shows a different state of the calculator's user interface. The numeric keypad and operators remain the same, but the function keys at the top have been updated. The new function keys include 1/X, X², √, and || (absolute value). The rest of the UI and code structure are identical to the previous screenshot.

Committing to VCS and pushing to Git-Hub

The version control for this project is git and the changes have been pushed to remote repository.

The screenshot shows the Visual Studio Code interface with the terminal tab active. The terminal window displays the following text:

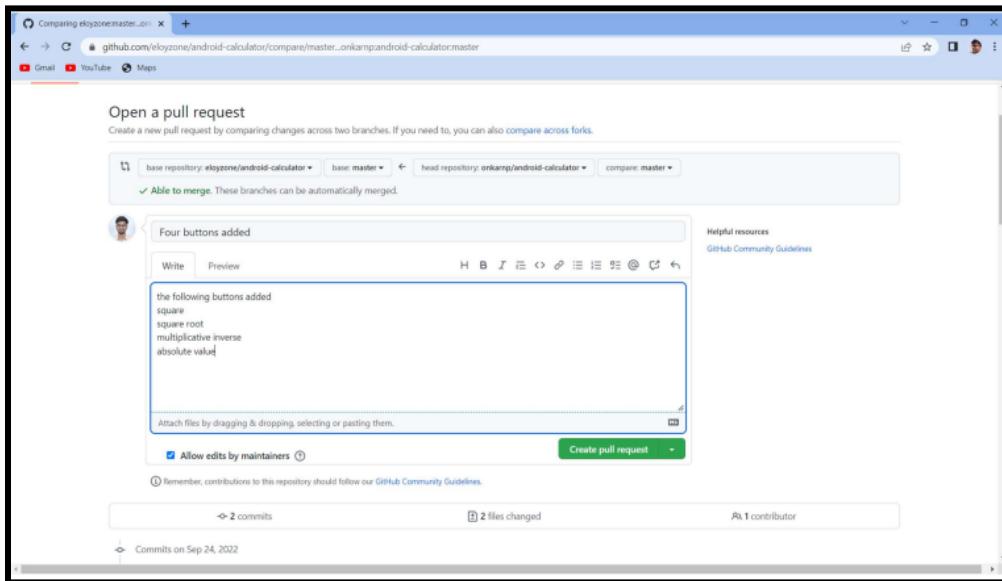
```

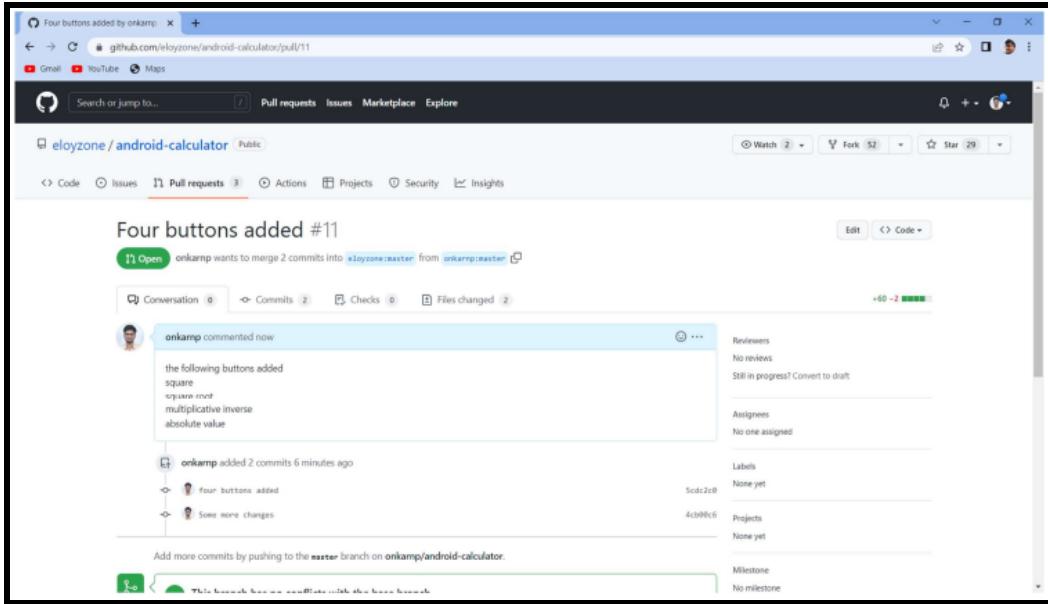
activity_main.xml - android-calculator - Visual Studio Code
File Edit Selection View Go Run Terminal Help
SOURCE CO... ✓ Commit ...
Message (Ctrl+Enter to co...
✓ Commit
PROBLEMS OUTPUT TERMINAL DEBUG CONSOLE JUPYTER
powershell + x ^ x
no changes added to commit (use "git add" and/or "git commit -a")
usage: git add [options] [-v] <pathspec>...
    --verbose          be verbose
    -p, --patch        select hunks interactively
    -e, --edit         edit current diff and apply
    --renormalize     renormalize EOL of tracked files (implies -u)
    -N, --intent-to-add record only the fact that the path will be added later
    -A, --all          add changes from all tracked and untracked files
    --ignore-removal   ignore paths removed in the working tree (same as --no-all)
    --refresh          don't add, only refresh the index
    --ignore-errors    just skip files which cannot be added because of errors
    --ignore-missing   check if - even missing - files are ignored in dry run
    --chmod (-|+)x    override the executable bit of the listed files
    --pathspec-from-file <file>
    --pathspec-from-nul with --pathspec-from-file, pathspec elements are separated with NUL character
PS C:\Users\Onkar Panchare\Desktop\calculator\android-calculator> git add -a
PS C:\Users\Onkar Panchare\Desktop\calculator\android-calculator> git commit -m "Four buttons added"
[master 4cc2c20] Four buttons added
 2 files changed, 58 insertions(+), 1 deletion(-)
PS C:\Users\Onkar Panchare\Desktop\calculator\android-calculator> git push .
Everything up-to-date

```

At the bottom of the terminal, status indicators show: In 21, Col 2, Spaces 4, UTF-8, CRLF, XML, Go Live, and a power icon.

Creating a pull request-





Conclusion-

Successfully contributed to an open-sourced project on github and created a pull request to open-source repository

References-

<https://docs.github.com/en/desktop/working-with-your-remote-repository-on-github-or-github-enterprise/creating-an-issue-or-pull-request-from-github-desktop>

ASSIGNMENT 11

Title- Docker container- An OSS virtualization command practice, use and understanding.

Objectives –

- To understand and use docker virtualization as OSS.
- With the help of Docker-compose deploy the Wordpress and Mysql container and access the front end of Wordpress.

Introduction -

Docker is an open platform designed for developing, shipping, and running applications. It allows for the separation of applications from infrastructure, facilitating swift software delivery. Docker enables the management of infrastructure in a manner similar to application

management. Leveraging Docker's methods for rapid shipping, testing, and deployment, it substantially minimizes the time gap between code development and production implementation.

Docker Features

1. Easy and Faster Configuration
2. Increase productivity
3. Application Isolation
4. Swarm
5. Routing Mesh
6. Security Management

Installation

³³
Uninstall old versions:

```
$sudo apt-get remove docker docker-engine docker.io
```

Install Docker CE:

```
$sudo apt-get update  
$sudo apt-get install docker-ce  
$ sudo apt-get install docker-ce 3.apt-cache madison docker-ce 17.09.0 ce-0 ubuntu  
https://download.docker.com/linux/ubuntu xenial/stable amd64 Packages
```

Implementing wordpress through docker screenshots-

1. Pulling hello-world image from docker-hub.
⁸⁶

```
ite@OptiPlex-3050: $ sudo docker run hello-world
Unable to find image 'hello-world:latest' locally
latest: Pulling from library/hello-world
2db29710123e: Pull complete
Digest: sha256:62af9efd515a25f84961b70f973a798d2eca956b1b2b026d0a4a63a3b0b6a3f2
Status: Downloaded newer image for hello-world:latest

Hello from Docker!
This message shows that your installation appears to be working correctly.

To generate this message, Docker took the following steps:
 1. The Docker client contacted the Docker daemon.
 2. The Docker daemon pulled the "hello-world" image from the Docker Hub.
    (amd64)
 3. The Docker daemon created a new container from that image which runs the
 executable that produces the output you are currently reading.
 4. The Docker daemon streamed that output to the Docker client, which sent it
 to your terminal.

To try something more ambitious, you can run an Ubuntu container with:
$ docker run -it ubuntu bash

Share images, automate workflows, and more with a free Docker ID:
https://hub.docker.com/

For more examples and ideas, visit:
https://docs.docker.com/get-started/
```

2. Pulling wordpress image from docker-hub.

```
it@it-OptiPlex-3050:~$ sudo docker pull wordpress
[sudo] password for it:
Using default tag: latest
latest: Pulling from library/wordpress
31b3f1ad4ce1: Already exists
ad30ef427bea: Pull complete
deeb65fd0ffb: Pull complete
136a0d294b5e: Pull complete
c8d44545310e: Pull complete
f4d7b00e3206: Pull complete
294cc749e981: Pull complete
e19e2497f8a5: Pull complete
b0f9ed317db4: Pull complete
325b2945a2e0: Pull complete
8285ab747036: Pull complete
588c5e3629c0: Pull complete
b967f35769db: Pull complete
b163598a08e0: Pull complete
69be19c6283b: Pull complete
93b26c57a35d: Pull complete
1a7a09ffbf3b: Pull complete
8f0e13184ffc: Pull complete
148b3414dc3e: Pull complete
bb6e545e086c: Pull complete
aeb47f5fd8d1: Pull complete
Digest: sha256:3dff5e9e1497b522b48dd8a0fcf50dfbbb925f1487c6db581c28e73fdbfc49c1
Status: Downloaded newer image for wordpress:latest
docker.io/library/wordpress:latest
```

3. Pulling my-sql image.

```
it@it-OptiPlex-3050:~$ sudo docker pull mysql
[sudo] password for it:
Using default tag: latest
latest: Pulling from library/mysql
051f419db9dd: Pull complete
7627573fa82a: Pull complete
a44b358d7796: Pull complete
95753aff4b95: Pull complete
a1fa3bee53f4: Pull complete
f5227e0d612c: Pull complete
b4b4368b1983: Pull complete
f26212810c32: Pull complete
d803d4215f95: Pull complete
d5358a7f7d07: Pull complete
435e8908cd69: Pull complete
Digest: sha256:b9532b1edeaa72b6cee12d9f5a78547bd3812ea5db842566e17f8b33291ed2921
Status: Downloaded newer image for mysql:latest
docker.io/library/mysql:latest
```

4. Pulling nginx server image on docker-hub.

```
it@it-OptiPlex-3050: ~ $ sudo docker pull nginx
Using default tag: latest
latest: Pulling from library/nginx
31b3f1ad4ce1: Already exists

fd42b079d0f8: Pull complete

30585fbbebc6: Pull complete

18f4ffdd25f4: Pull complete

9dc932c8fba2: Pull complete

600c24b8ba39: Pull complete

Digest: sha256:0b970013351304af46f322da1263516b188318682b2ab1091862497591189ff1
Status: Downloaded newer image for nginx:latest
docker.io/library/nginx:latest
```

5. Accessing wordpress on local host after binding port 5000 on host machine to container port (port no. 80/tcp)

Command-

```
$sudo docker run -p 5000:80 wordpress
```

ASSIGNMENT 12

Title:- Find python kernel code and compile it or use any python library for any application.

Objective : - To know how open source software is developed with Licensing

Outcome : - Self learning/lifelong learning (PO: b, I, j, k, l)

Instruction for the Assignment : Develop simple software for basic needs such as editors etc.

Theory :

51 ArangoDB is a native NoSQL multi-model database system developed by triAGENS GmbH, 38 recognized as one of the most popular open-source NoSQL databases. Described as a "native multi-model" database, it's designed to store and query key/value, document, and graph data using a common language. ArangoDB excels in scalable and efficient graph data queries, utilizing JSON as its default storage format and a fast binary format, Velocity Pack, for serialization and storage. The database natively stores nested JSON objects, eliminating the need to disassemble resulting JSON objects and preserving the tree structure of XML data.

Feature

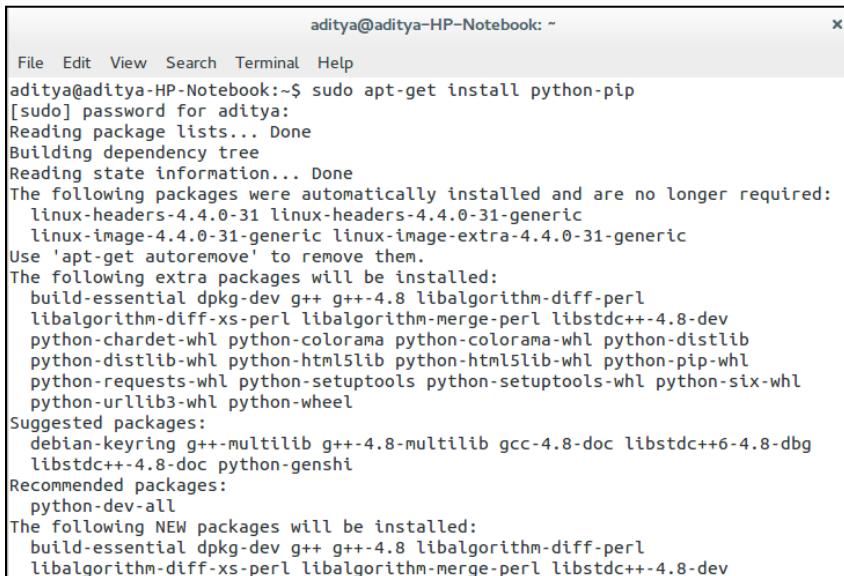
1. Multi-model database 79
2. Native support for key/value, document, and graph data
3. Clean, Pythonic interface
4. Lightweight
5. High ArangoDB REST API coverage
6. Scalable and efficient graph data queries
7. Default storage format using JSON
8. Internal use of ArangoDB's Velocity Pack for fast and compact binary serialization
9. Native storage of nested JSON objects
10. Preserves tree structure of XML data
11. Open-source with an open-source license

Compatibility

1. Supported Python versions include 2.7.x, 3.4.x, 3.5.x, and 3.6.x.
2. The python-arango's latest version (3.x) exclusively supports ArangoDB 3.x.
3. Older python-arango versions are compatible with ArangoDB 1.x and 2.x only.

Installation

```
1. pip install python-arango
```



```
aditya@aditya-HP-Notebook: ~
File Edit View Search Terminal Help
aditya@aditya-HP-Notebook:~$ sudo apt-get install python-pip
[sudo] password for aditya:
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following packages were automatically installed and are no longer required:
  linux-headers-4.4.0-31 linux-headers-4.4.0-31-generic
  linux-image-4.4.0-31-generic linux-image-extra-4.4.0-31-generic
Use 'apt-get autoremove' to remove them.
The following extra packages will be installed:
  build-essential dpkg-dev g++ g++-4.8 libalgorithm-diff-perl
  libalgorithm-diff-xs-perl libalgorithm-merge-perl libstdc++-4.8-dev
  python-chardet-whl python-colorama python-colorama-whl python-distlib
  python-distlib-whl python-html5lib python-html5lib-whl python-pip-whl
  python-requests-whl python-setuptools python-setuptools-whl python-six-whl
  python-urllib3-whl python-wheel
Suggested packages:
  debian-keyring g++-multilib g++-4.8-multilib gcc-4.8-doc libstdc++-6-4.8-dbg
  libstdc++-4.8-doc python-genshi
Recommended packages:
  python-dev-all
The following NEW packages will be installed:
  build-essential dpkg-dev g++ g++-4.8 libalgorithm-diff-perl
  libalgorithm-diff-xs-perl libalgorithm-merge-perl libstdc++-4.8-dev
```

Installation of arango

```
2. pip install -e git+git@github.com:joowani/python- arango.git@masteregg=python- arango
```

Conclusion

- 1.Used Python Driver for ArangoDB, a NoSQL graph database.
- 2.Used Python libraries in small applications.

Reference :- <https://github.com/vinta/awesome-python>

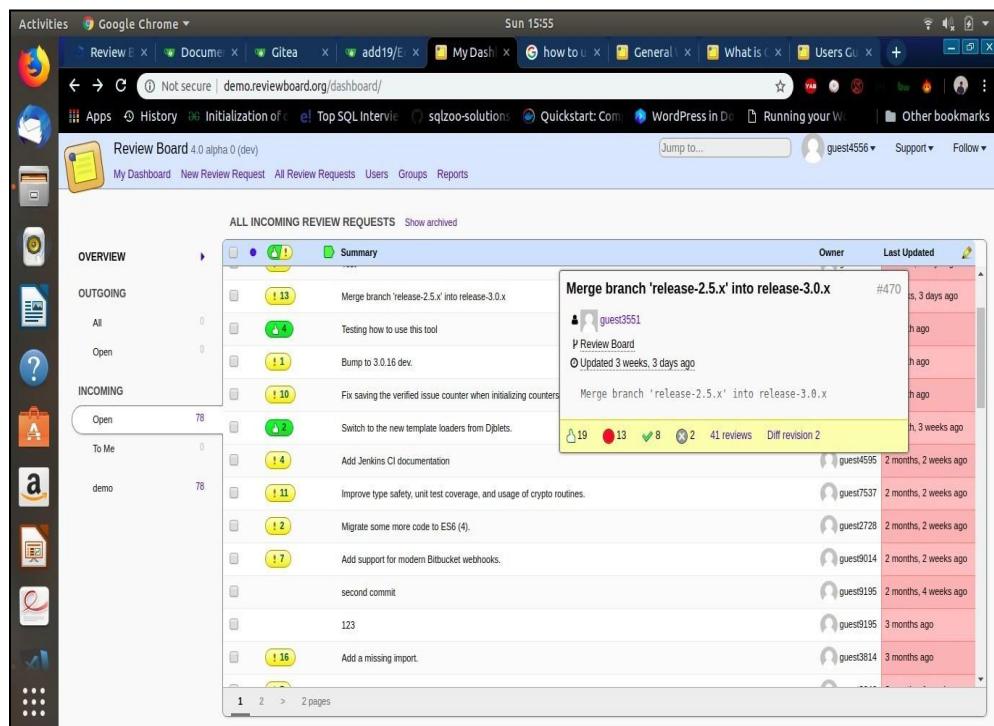
ASSIGNMENT 13

Title:- Agile s/w engineering by using Tuleap, review board and gitea (tools of agile setup)

Objective:- To know how tools of agile work.

Reviewboard: Bitnami installers are available. Docker containers are available as well.

Usage: It is a tool for managing code review.



Definition of Code Review

Code review involves sharing segments of source code for examination by other developers, aiming to identify and rectify bugs and design flaws before the code is integrated into the final product. This practice significantly contributes to product quality by identifying and addressing issues early in the development process. While not universally adopted, an increasing number of companies and developers are incorporating code review into their development culture and requirements.

There are two primary types of code review: pre-commit and post-commit. Pre-commit review involves assessing code before it is added to the codebase. Developers upload a diff file to the Review Board, allowing reviewers to comment and approve the code before its official inclusion in the repository. On the other hand, post-commit review occurs after the code has been added to the repository. The code is initially committed, and the review takes place at a later stage. Any necessary fixes are addressed through subsequent commits.

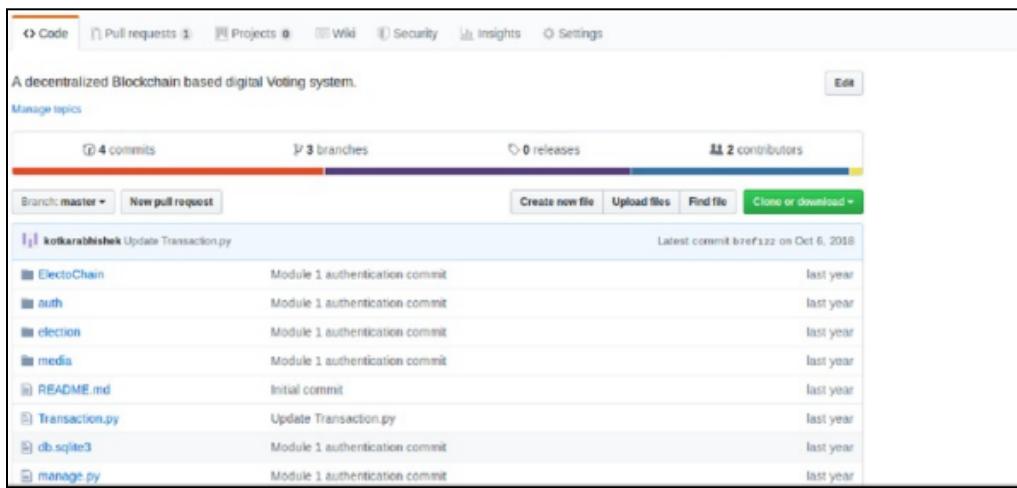
General Workflow:

Review Board supports many different workflows, but most people use a pre-commit review model. The general process for using Review Board for pre-commit review is as follows:

2. 1. Make a change to your local source tree.
2. Create a review request for your new change.
3. Publish the review request and wait for your reviewers to see it.
4. Wait for feedback from the reviewers.
5. If reviewers have requested changes:
 1. Update the code in your tree and generate a new diff.
 2. Upload the new diff, specify the changes in the Change Description Box, and publish.
 3. Jump back to Step 4.
6. If reviewers say, “Ship It!”
 1. Submit your changes to the repository.
 2. Click Close - Submitted on the review request action bar.

Gitea

Gitea, a lightweight code hosting solution written in Go and community-managed, operates as an open-source git repository server. Released under the MIT License, Gitea is characterized by its simplicity and shares common features with other git services. While platforms like Github serve as major hubs for source code sharing on the Internet, Gitea offers a self-hosting option with comparable functionalities.



Conclusions: Successfully used various different tools of agile setup.

References:-

<https://packetriot.com/tutorials/posts/setting-up-gitea/>

<https://www.reviewboard.org/docs/manual/dev/>

ASSIGNMENT 18

Title: Licensing (terms and conditions) comparisons:

1. Social media (Youtube, facebook, tweeter, tiktok, linkedin)
2. Email (gmail, rediff, yahoo)
3. Public cloud (AWS, azure, GCP, Alibaba)
4. Proprietary software's (any two well known: Ex: Win vs MS Office)
5. FOSS software (Mozilla Firefox, LibreOffice, GIMP, VLC Media Player)

Any two comparisons to be submitted in table form (point wise) with respect to comment on security/use of personal data.

1. Social media (Youtube, facebook, tweeter, tiktok, linkedin)

Aspect	Youtube	Tiktok
a) Security Measures	<ul style="list-style-type: none"> - Utilizes content moderation algorithms to detect and remove inappropriate content. - Offers privacy settings for 36	<ul style="list-style-type: none"> - Utilizes content moderation algorithms to detect and remove inappropriate content. - Offers privacy settings for 36

	<p>videos. 43 - Users can report and block accounts. 48 - May collect user data for targeted ads.</p>	<p>videos. 43 - Users can report and block accounts. 48 - May collect user data for targeted ads.</p>
b) Data Collection	<ul style="list-style-type: none"> - Collects user data for personalized ads and content recommendations. - Tracks user interactions on the platform. - May share data with third-party advertisers. - Offers some control over ad personalization settings. 	<ul style="list-style-type: none"> - Gather extensive user data for content customization and targeted advertising. - Monitors user interactions and preferences to enhance content delivery. - May share data with business partners. - Users have limited control over data usage.
c) Data Transparency	<ul style="list-style-type: none"> - Provides privacy settings to control who can view user-uploaded content. - Offers an Ad Settings page to manage ad personalization. - Users can access their data in the Google Account dashboard. 	<ul style="list-style-type: none"> - Offers privacy settings to control who can interact with the user's content. - Provides a Privacy Policy detailing data collection and sharing practices. - Users can request their data through the platform. - Some concerns raised about data handling practices.

2. Comparison of Email Services: Gmail vs. Yahoo

Aspect	Gmail	Yahoo
Security Measures	<ul style="list-style-type: none"> - Utilizes encryption for emails in transit and at rest. - Offers two-factor authentication for added account security. - Scans emails for potential malware and phishing attempts. - Blocks suspicious sign-in attempts. 	<ul style="list-style-type: none"> - Provides encryption for emails in transit. - Offers two-factor authentication to enhance account security. - Scans incoming emails for malware and phishing threats. - Alerts users about suspicious account activity.
Data Collection	<ul style="list-style-type: none"> - Collects user data for 	<ul style="list-style-type: none"> - Collects user data for

	<p>targeted advertising based on email content.</p> <ul style="list-style-type: none"> - Uses data to personalize services and display relevant ads. - Allows users to control ad personalization settings. - Some concerns about data sharing with third parties. 	<p>personalized advertising and service customization.</p> <ul style="list-style-type: none"> - Analyzes email content to display targeted ads. - Provides options to manage ad preferences and opt-out of interest-based ads. - May share data with affiliates and partners.
Data Privacy	<ul style="list-style-type: none"> - Provides options for users to manage data in Google Account settings. - Allows users to control data sharing with third-party apps. - Offers a Privacy Checkup to review and adjust privacy settings. 	<ul style="list-style-type: none"> - Offers privacy controls to manage personal data and advertising preferences. - Users can adjust ad settings and opt-out of interest-based ads. - Provides a Privacy Dashboard to review account activity and data usage. - Faced data breach incidents in the past.

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