Software Engineering Tools Lab

Assignment No. 1

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1. Differentiate in between free software, open-source software and proprietary software with respect to its properties.
Ans:
Difference between free software and open-source software

Free Software	Open-source Software
1) Free software means software that respects users' freedom and community.	1) Open-source software can be modified as per our need by any user openly.
2) Every free software is open source.	2) Every open-source software is not free software.
3) There is no such issue that exists in free software.	3) There are many different open-source software licenses, and some of them are quite restricted, resulting in open-source software that is not free.
4) No restrictions are imposed on free software.	4) Open-source software occasionally imposes some constraints on users.
5) The users have the freedom to run, copy, distribute, study, change and improve the software.	5) When we say Open Source, the source code of the software is available publicly with Open-Source licenses like GNU (GPL) which allows you to edit the source code and distribute it.
6)Examples: Linux kernel, the BSD and Linux operating systems, the GNU Compiler Collection and C library; the MySQL relational database; the Apache web server; and the Sendmail mail transport agent.	6)Examples: Apache HTTP Server, the e-commerce platform Open-Source Commerce, internet browsers Mozilla Firefox, and Chromium and the full office suite LibreOffice.

Difference between open-source software and proprietary software

Open-source software	Proprietary software
1) Open-source software is computer software whose source code is available openly on the internet and programmers can modify it to add new features and capabilities without any cost.	1) Proprietary software is computer software where the source codes are publicly not available only the company which has created can modify it.
2) Here the software is developed and tested through open collaboration.	2) Here the software is developed and tested by the individual or organization by which it is owned not by the public.
3) In open-source software the source code is public.	3) In proprietary software, the source code is protected.
4) Open-source software can be installed on any computer.	4) Proprietary software cannot be installed into any computer without a valid license.
5) Users do not need to have any authenticated license to use this software.	5) Users need to have a valid and authenticated license to use this software.
6) Open-source software is managed by an open-source community of developers.	6) Proprietary software is managed by a closed team of individuals or groups that developed it.

2.Enlist some examples along with its purpose and properties (at least 10) of FOSS and proprietary software with respect to database.
Ans:
a) Examples of FOSS software
i)MySQL:
Purpose: Relational database management system.

Properties: Widely used, flexible, and scalable, with a strong community of developers.

ii)PostgreSQL:
Purpose: Object-relational database management system.
Properties: Advanced data management features, including support for data integrity and security, with a strong community of developers.

iii)MariaDB:
Purpose: Community-driven fork of MySQL with additional features.
Properties: Offers compatibility with MySQL, with additional performance optimizations and improved scalability.

iv)MongoDB:
Purpose: Document-oriented database management system.
Properties: Flexible and scalable, with support for dynamic schema and aggregation of data.

v) CouchDB:
Purpose: Document-oriented database management system.
Properties: Designed for ease of use and scalability, with built-in support for distributed data storage and real-time data synchronization.

Examples of Proprietary software
i)Oracle Database:
Purpose: Enterprise database management
Properties: Scalable, highly secure, and offers advanced analytics capabilities.

ii)3Microsoft SQL Server:
Purpose: Relational database management for small to large organizations.
1Properties: Supports high availability and disaster recovery, offers robust security features, and integrates with Microsoft's ecosystem of business applications.

iii)4IBM DB2:
Purpose: Advanced data management for transactional and analytical workloads.
Properties: Scalable and secure, with features for optimizing performance and reducing downtime.

iv)SAP HANA:
Purpose: In-memory database for real-time analytics and transactions.

Properties: Offers fast processing times and the ability to handle big data workloads, integrates with SAP's suite of business applications.

3.Enlist some examples of free open-source exam software for online assessment.
Ans:
Examples of free open-source software for online assessment:
i) TCExam
ii) VirtualX
iii) Moodle
iv) TAO
v) Kaldin
vi) Papershala
vii) Edbase
viii) Mettl
ix) FlexiQuiz
x) Eklavvya
xi) Think Exam

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4. Demonstrate any one exam software which is open source and freely available.
Ans:
Moodle:
Moodle is an best open source software for Learning Management System (LMS) coded in PHP and distributed under GNU General Public License.
This online examination system php open source has a strong and integrated system which is suitable for educators, administrators and learners. Moodle is also one of the most trusted, secure and easy to use software available in the market.
This software can also be used to create customizable websites with online courses for educators and trainers to achieve learning goals. Moodle online assessment software can also be scaled depending on the number of people using it.
So, its suitable for managing a bunch of few students in a coaching institute or hundreds of employees in a large organization.

Features of moodle:
i)Provides collaborative tools and activities for group learning
ii)Offers an all-in-one calendar to keep track of your events
iii)Provides an easy file management system
iv)It has a simple text editor

v)You can receive automatic notifications and can the progress of examinee alongside.

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5. Demonstrate FOSS software related to database.
Ans:
PostgreSQL
PostgreSQL is an object-relational database management system, founded on July 8, 1996. Developed by the PostgreSQL Global Development Group, it is written in C and works in most UNIX-like operating systems and Windows
Features
Built-in data types for Array, Range, UUID, Geolocation, etc.
Native support for document storage (JSON-style), XML, and key-value storage (Hstore)
Synchronous and asynchronous replication
Scriptable in PL, Perl, Python, and more
Full-text search

When to use PostgreSQL
PostgreSQL has a clear advantage if you need partial NoSQL facilities for a hybrid data model. Since document and key-value storage are natively supported, you don't need to go hunting for, installing, learning, and maintaining.

When not to use PostgreSQL
PostgreSQL doesn't make sense when your data model isn't relational and/or when you have very specific architectural requirements. For instance, consider Analytics, where new reports are constantly being created from existing data. Such systems are read-heavy and suffer when a strict schema is imposed on them. Sure, PostgreSQL has a document storage engine, but things start to fall apart when you're dealing with large datasets.

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6. How does the Exam software work?
Ans:
Exam software is popularly used by recruiters and educational institutions. It is used for setting up online exams. The best online examination software helps with the following procedures:

i)Students' Registration

Online exam software helps with the registration process of students and generates unique IDs for them which becomes easy for institutions to handle the tests separately and accordingly as per the batches.

ii)Test Paper Creation
A subjective, objective, multiple-choice, and other types of questions can be created online and zero spam can be ensured.

iii)Take Tests Anytime, Anywhere
Students can take tests from anywhere with a stable internet connection and a system. Similarly, teachers can invigilate directly through the system. There is no need of the classrooms for sitting arrangements and supervisions need.

iv)Automated Evaluation
Teachers don't need to evaluate answers manually, as the exam software helps analyze students' performance digitally.

v)Track Students' Progress
YouTube broadcast software enables users to list their live streams as videos on their channels. This way the live stream can be seen even after it ended. Students can get the study material even after the teaching in classes.

vi)Data analysis
The performance reports include detailed info about the strengths and weaknesses of every student. Accordingly, teachers can make the improvement plan.