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Software Engineering Tools Lab

Assignment 1

(Module 1- Introduction to FOSS)

1. Differentiate between free software, Open source software and proprietary software with respect to its properties.

=>A] Free Software:

It means software that respects users' freedom and community. Roughly, it means that the users have the freedom to run, copy, distribute, study, change, and improve the software. It has nothing to do with price. It is about freedom.

B] Open Source Software:

Open Source Software is something that you can modify as per your needs, and share with others without any licensing violation burden. 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.

C] Proprietary Software:

It is computer software where the source codes are publicly not available only the country that has created them can modify it. Here the software is developed and tested by the individual or organization by which it is owned not by public. This software is managed by a closed team of individuals or groups that developed it. We have to pay to get this software and its commercial support is available for maintenance. The company gives valid authentication licenses to the users to use this software.

- **Difference between Open-Source and Proprietary software**

Open Source Software	Proprietary Software
Source code is available openly on the internet and programmers can modify it to add new features and capabilities without any cost.	Source code are publicly not available only the company that has been created can modify them.
Developed and tested by open collaborations.	Developed and tested by the individuals/organizations by which it is owned not by the public.
The source code is public.	The source code is protected.
Can be installed on any computer.	Cannot be installed on any computer without a valid license.
Faster fixes of bugs and better security are availed due to the community.	The vendor is completely responsible for fixing malfunctions.
Limited Intellectual Property Protections.	Full Intellectual Property Protections.
Developed and maintained by non-profit organizations.	Developed and maintained by for-profit entities.
Examples: Android, Firefox, Open Office, etc.	Examples: Windows, Internet Explorer, Microsoft Office, etc.

- **Difference between Free and Open source software**

Free Software	Open-Source Software
Every free software is open-source.	Every open-source software is not free.
No restrictions are imposed.	Occasionally imposes some constraints on users.
Software freedom translates to social freedom.	There are no ethics directly associated with software.

Freedom is valued more than an economical advantage.	Freedom should be allowed, not imposed.
Its main aim is to provide the software without any costs.	Its main aim is to achieve more economical benefits.
Examples: Linux Kernel, MySQL relational database, Apache server, etc.	Examples: Mozilla Firefox, LibreOffice, etc.

2. Enlist some examples along with the purpose and properties (at least 10) of FOSS and proprietary software with respect to the database.

FOSS

1. MySQL: A free, open-source relational database management system (RDBMS) with a wide range of features such as data storage, indexing, transactions, and more.
2. PostgreSQL: An open-source object-relational database system (ORDBMS) that provides a flexible and powerful platform for managing data.
3. MongoDB: An open-source document-oriented NoSQL database system designed to be highly scalable and able to store large amounts of data.
4. Apache Cassandra: An open-source, distributed NoSQL database system, designed to provide a fault-tolerant, highly available, and consistent data store.
5. Redis: An open-source, in-memory data store that supports a wide range of data structures and is highly performant.

Proprietary

1. Oracle Database: A commercial relational database that provides a wide range of features such as data warehousing, replication, backup and recovery, and analytics.

2. Microsoft SQL Server: A commercial RDBMS from Microsoft that provides a range of features including high availability, scalability, and security.
3. IBM DB2: A commercial relational database system from IBM that provides a wide range of features such as data warehousing, replication, and analytics.
4. SAP HANA: A commercial in-memory database system designed to provide a highly available and reliable data store.
5. Microsoft Access: A commercial database system designed to provide a comprehensive data management system for small businesses and organizations.

3. Enlist some examples of free open-source exam software for online assessment.

1. TCExam
2. VirtualX
3. Moodle
4. TAO
5. Kaldin
6. Papershala
7. Edbase
8. Mettl
9. FlexiQuiz
10. Eklavvya
11. Think Exam

4. Demonstrate any one exam software which is open source and freely available.

TCEexam:

TCEexam is a web-based online examination system that is platform-independent. It has high accessibility to provide equal opportunities to people with disabilities too. TCEexam is divided into a number of modules and topics. The software has a huge number of modules. Each module has a plethora of topics and each topic has an unlimited number of questions. For each module or topic, the software randomly extracts a certain number of questions depending on their difficulty and type of questions. Thus, this examination software generates unique question papers for every user, eliminating the risk of cheating by users. The software also has provisions to generate printable OMR sheets.

A filled OMR sheet can then be scanned and uploaded to TCEexam for automatic scoring and reporting.

Features:

- Platform independent.
- No expensive hardware requirements.
- Internationalization — Enables translation in many languages and also supports the right to left languages like Arabic, Hebrew, and Persian.
- High accessibility — provides for people with disabilities.

5. Demonstrate FOSS software related to databases.**PostgreSQL**

It 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

- a. PostgreSQL works with every significant language and middleware.
- b. It bolsters simultaneous control.
- c. Its server-side programming usefulness is extremely full-grown.
- d. It has support for JSON licenses.

6. How does the Exam software work?

Exam software is designed to facilitate the delivery and processing of online exams and assessments. It provides a secure environment for students to take their tests and quizzes, as well as provides instructors with the tools to create and deliver exams and monitor student progress.

The exam software is typically broken down into two main parts: the student interface and the instructor interface.

The **student interface** is the portion of the software that students use to take their exams. This typically includes login credentials, access to the exam questions, and in some cases, a timer to keep track of the amount of time students have to take the exam.

The **instructor interface** is used by instructors to manage the exams. This includes creating exam questions, setting parameters for the exam (such as time limits and required passing scores), and monitoring student performance. The instructor interface also typically includes reporting and analytics, to allow instructors to get a deeper understanding of how students are performing on the exams. Overall, exam software is a powerful tool for both instructors and students, providing a secure and streamlined platform for testing and assessment.