Software Engineering Tools Lab

Assignment No-1

(Module 1- Introduction to FOSS)

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PRN: 2020BTECS00088

Batch: T8

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

S.No.	Open Source software	Proprietary Software
01.	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.	Proprietary software is computer software where the source codes are publicly not available only the company which has created can modify it.
02.	Here the software is developed and tested through open collaboration.	Here the software is developed and tested by the individual or organization by which it is owned not by the public.
03.	In open-source software the source code is public.	In proprietary software, the source code is protected.
04.	Open-source software can be installed on any computer.	Proprietary software can not be installed into any computer without a valid license.
05.	Users do not need to have any authenticated license to use this software.	Users need to have a valid and authenticated license to use this software.

S.No.	Open Source software	Proprietary Software
06.	Open-source software is managed by an open-source community of developers.	Proprietary software is managed by a closed team of individuals or groups that developed it.
07.	It is more flexible and provides more freedom which encourages innovation.	It is not much flexible so there is a very limited innovation scope with the restrictions.
08.	Users can get open software free of charge.	Users must have to pay to get the proprietary software.
09.	In open-source software faster fixes of bugs and better security are availed due to the community.	In proprietary software, the vendor is completely responsible for fixing malfunctions.
10.	Limited Intellectual Property Protections	Full Intellectual Property Protections
11.	Usually Developed and Maintained by non-profit organizations.	Usually Developed and Maintained by for-profit entities.
12.	Examples are Android, Linux, Firefox, Open Office, GIMP, VLC Media player, etc.	Examples are Windows, macOS, Internet Explorer, Google Earth, Microsoft Office, Adobe Flash Player, Skype, etc.

S.No.	Free Source Software	Open source software
1.	It was coined by the Free Software Foundation in the 1980s.	In response to the restrictions of free software, the phrase “open source” was coined in the late 1990s.

S.No.	Free Source Software	Open source software
2.	Software is an important part of people's lives.	Software is just software. There are no ethics associated directly with it.
3.	Software freedom translates to social freedom.	Ethics are to be associated with the people not with the software.
4.	Freedom is a value that is more important than any economical advantage.	Freedom is not an absolute concept. Freedom should be allowed, not imposed.
5.	Every free software is open source.	Every open-source software is not free software.
6.	There is no such issue that exists in free software.	There are many different open-source software licenses, and some of them are quite restricted, resulting in open-source software that is not free.
7.	No restrictions are imposed on free software.	Open-source software occasionally imposes some constraints on users.
8.	Examples: The Free Software Directory maintains a large database of free software packages. Some of the best-known examples include the 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.	Examples: Prime examples of open-source products are the Apache HTTP Server, the e-commerce platform Open Source Commerce, internet browsers Mozilla Firefox, and Chromium (the project where the vast majority of development of the freeware Google Chrome is done), and the full office suite LibreOffice.

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

- Examples of FOSS: GNU/Linux, Mozilla Firefox, VLC media player, SugarCRM, GIMP, VNC, Apache web server, LibreOffice, jQuery.

- Properties of FOSS:
  i. Better flexibility
  ii. Cost effectiveness
  iii. Enhanced reliability
  iv. Increased scalability
  v. Licensing convenience
  vi. Quicker integration
  vii. Improved security

- Examples of proprietary software: Microsoft Windows, Adobe Flash Player, PS3 OS, iTunes, Adobe Photoshop, Google earth, macOS, Skype, WinRAR, Oracle's version of java and some versions of Unix.

- Properties of proprietary software:
  i. Increased functionality and convenience
  ii. Superior customer support
  iii. Lower maintenance costs
  iv. Predictable releases

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

Free Open Source Exam Software List for Online Assessment

- TCExam
- VirtualX
- Moodle
- TAO
- Kaldin
- Papershala

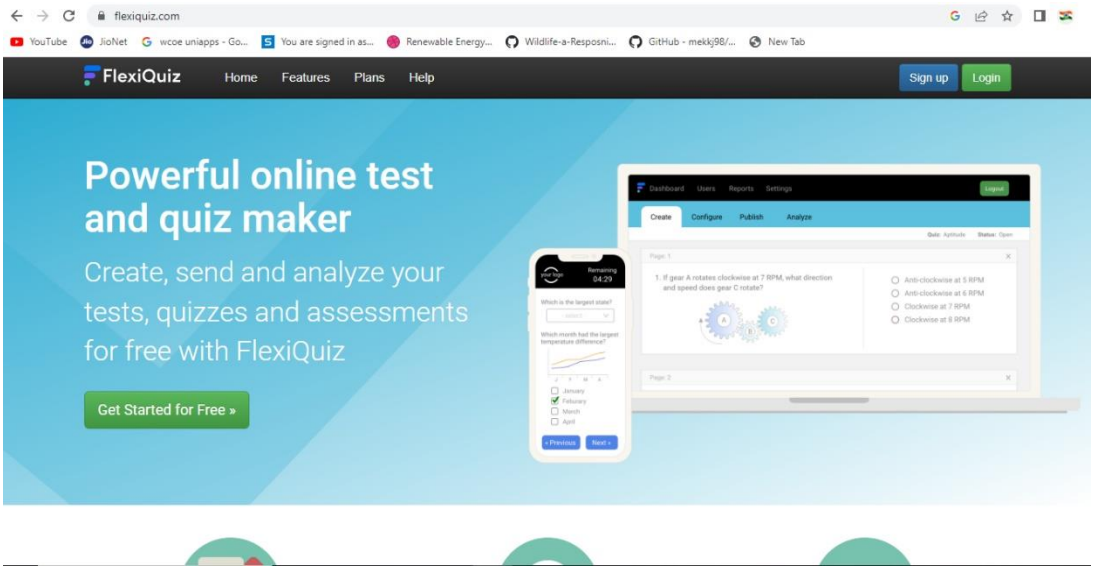
- Edbase
- Mettl
- FlexiQuiz
- Eklavvya
- Think Exam

Q4. Demonstrate any one exam software which is open source and freely available.

FlexiQuiz is a cloud-based exam maker where educators can quickly create, share, and analyze custom exams. We can choose from hundreds of configurable features to build professional exams that engage students and test their knowledge on any subject. The platform includes features such as; question banks, time limits, question randomization, email notifications, 9 question types, and the ability to add images, video, or audio.

Features: Auto-grading, powerful reports, schedule your tests, public and private tests, custom email invites, include images, free plan option, mobile ready, multiple question types, secured with SSL encryption, PDF reports, advanced configuration options, timed tests, respondent accounts, access anywhere, include video.

Interface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Create, send and analyze your tests, quizzes and assessments for free with FlexiQuiz
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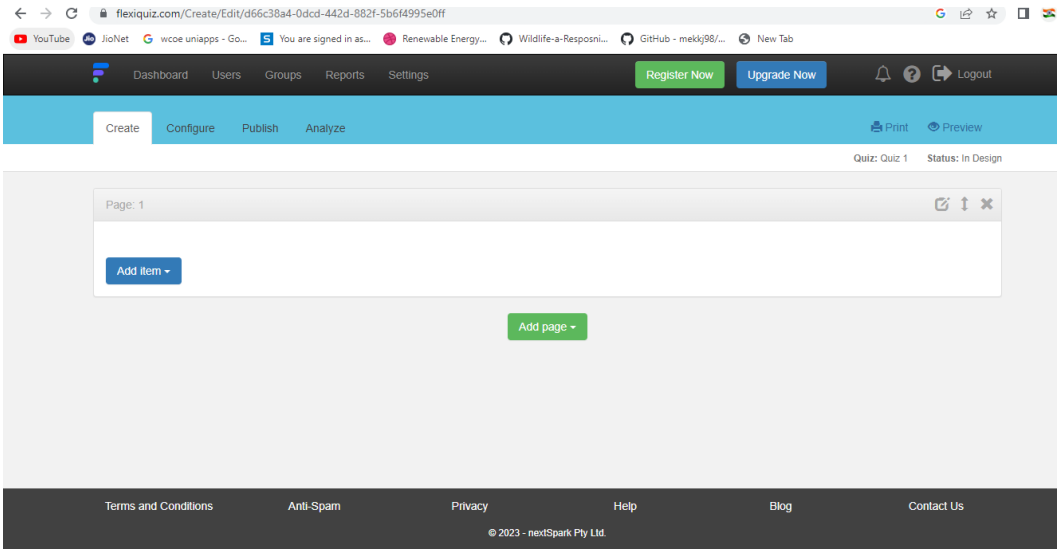
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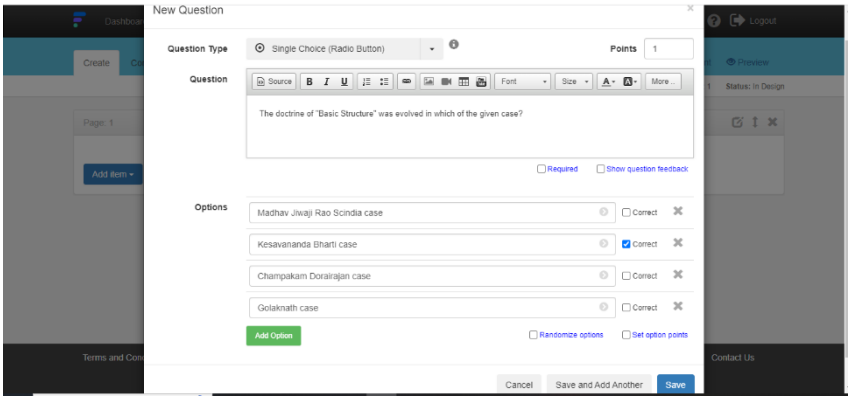
Create



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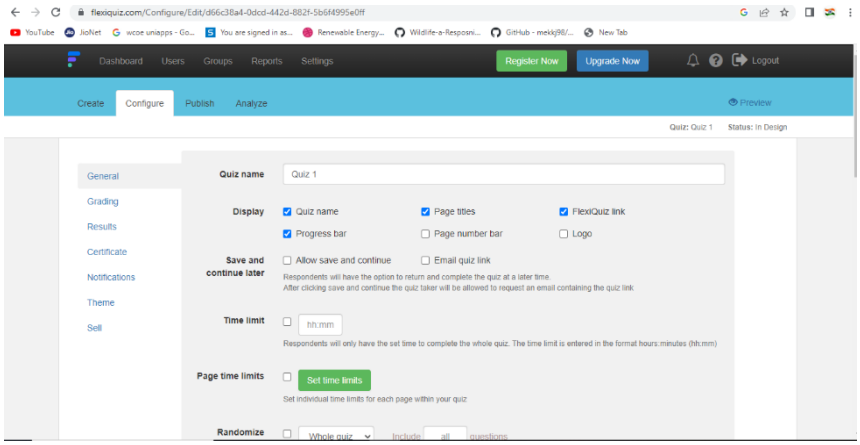

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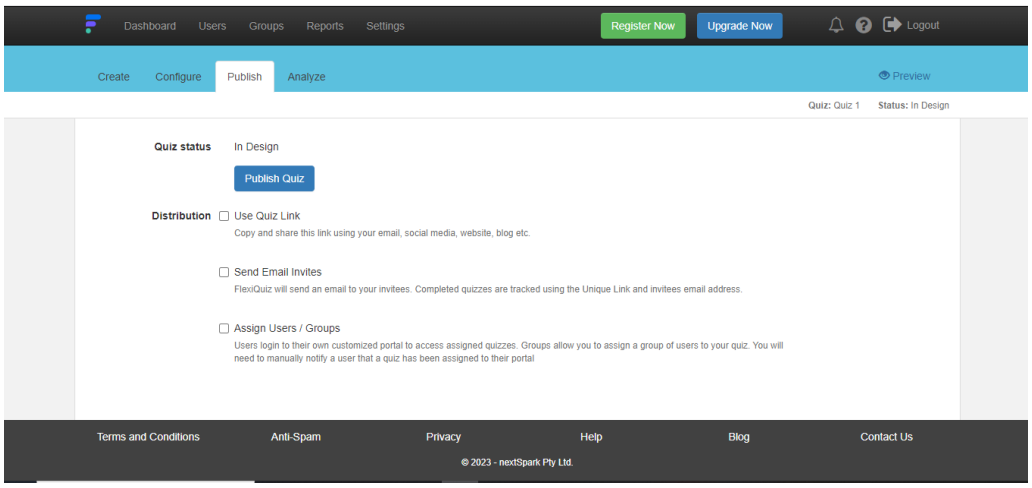
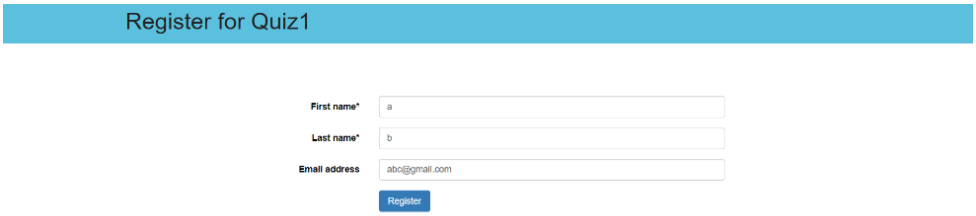
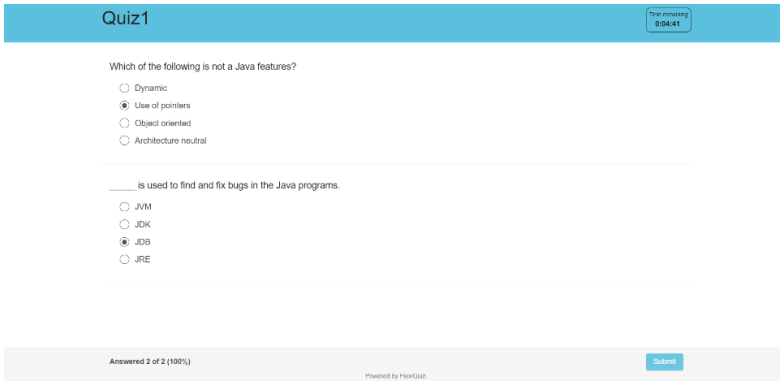


Test

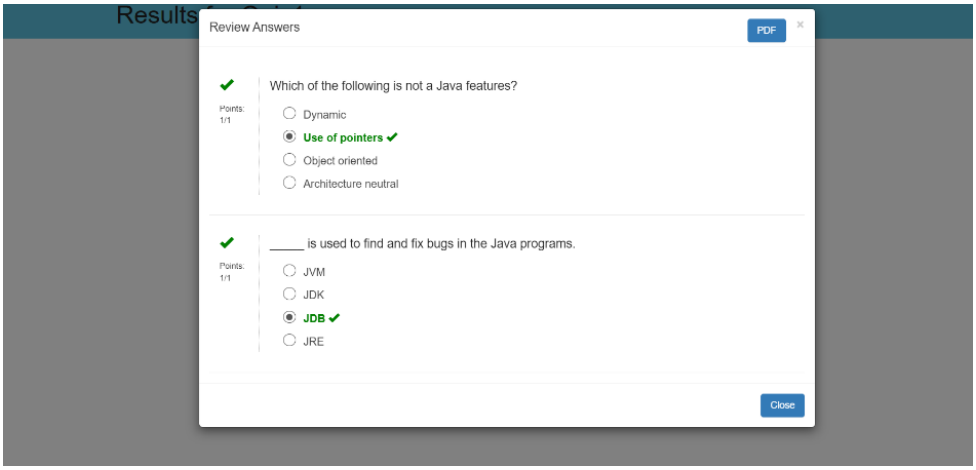


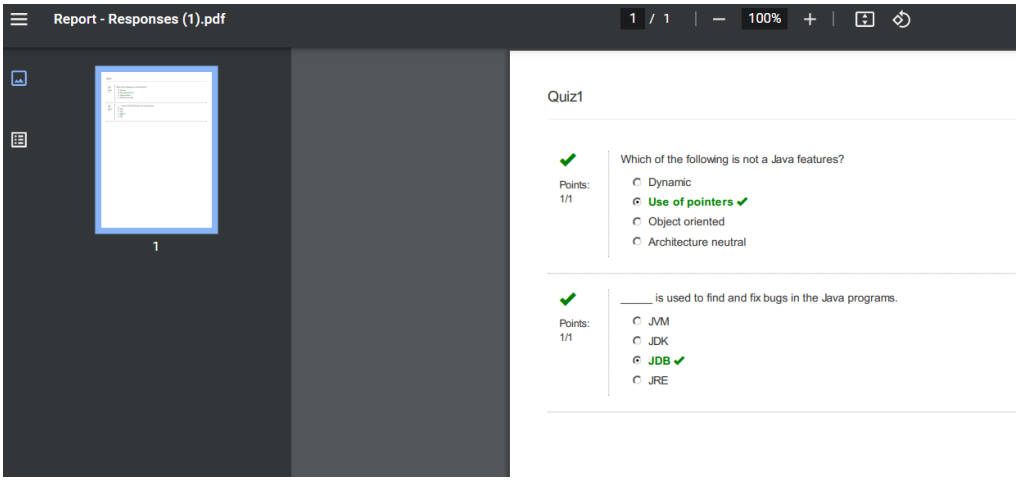


Score 2/2 (100%)

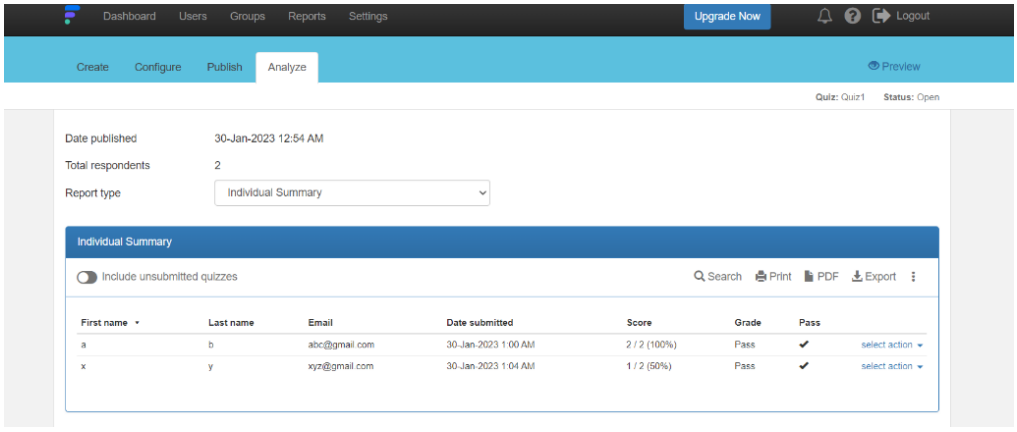
Duration 01m:10s

Review Answers





Analyze



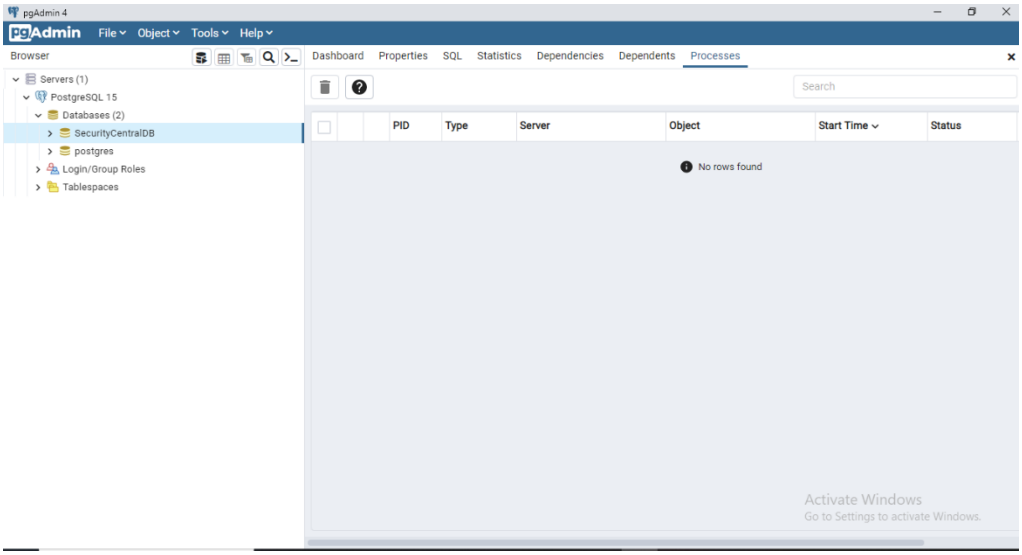
Q5. Demonstrate FOSS software related to database.

→ MongoDB is a popular open-source NoSQL database written in C++. MongoDB is a Dynamic Schema Document-Oriented Database that stores data in JSON-like documents.

Each database is made up of collections, which are made up of documents. Because of the varying number of fields, each document can be unique. Each document's size and content may differ from one another. MongoDB is a database that is highly scalable and performance-oriented.

PostgreSQL is one of the most advanced general-purpose object-relational database management system and is open-source. Being an open-source software, its source code is available under PostgreSQL license, a liberal open

source license. Anyone with the right skills is free to use, modify, and distribute PostgreSQL in any form. As it is highly stable, very low effort is required to maintain this DBMS. It is written in *C* programming language.



Connecting to postgres database from vs code using the connection string

```
import configparser
import psycopg2
from sqlalchemy import create_engine

config = configparser.ConfigParser()
config.read_file(open(r'config.ini'))
DSN = config.get('DB', 'host')
DB = config.get('DB', 'database')
UID = config.get('DB', 'user')
PWD = config.get('DB', 'password')
PORT = config.get('DB', 'port')
url = "postgresql://"+UID + ":"+PWD+"@"+DSN+":"+PORT+"/"+DB
conn_string = (url)


def getConnection():
    db = create_engine(conn_string)
```

```
    conn = db.connect()
    print('connected using url in sqlchemy')
    return conn


def getConnection2():
    conn = psycopg2.connect(conn_string)
    print('connected in psycopg2 through automatic call')
    return conn


if __name__ == "__main__":
    conn = getConnection()
    conn = getConnection2()
    cur = conn.cursor()
    sql1 = '''select * from solution where id=651;'''
    # sql1="""
    cur.execute(sql1)
    for i in cur.fetchall():
        print(i)
```

Config file to pass the essential credential

```
[DB]
host=localhost
database=SecurityCentralDB
user=postgres
password=samrat123
port=5432
```

Fetching result from database using the query

```
sql1 = '''select * from solution where id=651;'''
    cur.execute(sql1)
    for i in cur.fetchall():
        print(i)
```

Result:s

(651, 'Apache Commons Codec Plug-in', datetime.datetime(2023, 2, 2, 15, 9, 42, 935559, tzinfo=datetime.timezone(datetime.timedelta(seconds=19800))))

Q6. How does the Exam software work?

Remote proctoring is usually represented by a cloud-based solution that can easily be integrated into a Learning Management System (LMS) or a test platform. Different types of proctoring come with various customizable features, so educators can configure the assessments in compliance with their objectives. When it comes to the process of test-taking, an online proctored exam usually consists of the following steps,

i. Verification: The system verifies students' identities by comparing an image from their web cameras and a photo or a scan of their authentication documents. Once they've passed this procedure, they are allowed to commence the test.
ii. Real time monitoring: Online proctoring implies continuous student invigilation. It helps educators spot and prevent any suspicious activities. Depending on the proctoring type, the role of an observer can be taken by a human proctor or by AI-based software.
iii. Data storage and review: As soon as the exam is finished, proctoring software analyses the results and forms the reports. It's important to note, that all audio and video data is recorded and stored, thus, making it possible to review documentation in case of any controversies.