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Batch : T5

Subject : Software Engineering Tools Lab

Assignment 2 : Software Development Frameworks

Q1. List of Frameworks/IDEs/Softwares :

1. **Eclipse**
2. **Android SDK**
3. **Node.js**
4. **DotNet**
5. **Ruby on Rails**
6. **Anaconda**
7. **Google Colab**
8. **Django**
9. **Vue.js**
10. **Github**
11. **React**

For Every Framework/IDE/Software given are some questions to answer.

1) Eclipse

1. Original Author: IBM
2. Developers: Eclipse Foundation and a community of developers
3. Initial Release: June 21, 2001
4. Stable Release: Eclipse 2021-09 (4.21.0) released on September 15, 2021
5. Preview Release: Eclipse 2021-12 (4.22) M1 released on December 14, 2022
6. Repository (with cloud support): Eclipse Marketplace (https://marketplace.eclipse.org/) and Eclipse Che (https://www.eclipse.org/che/)
7. Written in (Languages): Java, C++, and other languages
8. Operating System Support: Windows, macOS, Linux, Solaris, AIX
9. Platform, portability: Cross-platform, written in Java
10. Available in (Total languages): Eclipse itself is available in English, but plugins can provide support for other languages.
11. List of languages Supported: Eclipse plugins can add support for a wide variety of programming languages including Java, C++, Python, JavaScript, Ruby, and more.
12. Type (programming tool, integrated development environment etc.): Integrated development environment (IDE)
13. Website: https://www.eclipse.org/

14. Features: Eclipse IDE includes a range of features such as syntax highlighting, code completion, refactoring, debugging, and more. It also supports a wide range of programming languages and frameworks, and can be extended with plugins to add additional functionality.
15. Size (in MB, GB etc): The size of the Eclipse IDE varies depending on the version and platform, but the Windows 64-bit version of Eclipse 2021-09 (4.21.0) is around 461 MB.
16. Privacy and Security: Eclipse IDE is open-source software and does not collect any data from users by default. However, some plugins may collect data or require additional permissions.
17. Type of Software (Open Source/License): Open-source software
18. If License – provide details: Eclipse Public License (EPL)
19. Latest Version: Eclipse 2021-09 (4.21.0)
20. Cloud Support (Yes/No): Yes, Eclipse Che provides cloud-based support for Eclipse projects.
21. Applicability: Eclipse IDE is widely used by developers for software development in a variety of programming languages and frameworks.
22. Drawbacks (if any): Eclipse IDE can be slow to start up and may consume a large amount of memory, especially when working on larger projects. It may also be overwhelming for new users due to the large number of features and options available.

2) Android SDK

1. Original Author: Google
2. Developers: Google and a community of developers
3. Initial Release: November 5, 2007
4. Stable Release: Android SDK 31.0.0 released on December 6, 2021
5. Preview Release: Android SDK 32 Beta 1 released on January 19, 2022
6. Repository (with cloud support): Android Studio includes support for cloud repositories such as GitHub, and cloud-based build services such as Firebase Test Lab and Google Cloud Build.
7. Written in (Languages): Java, C++, and other languages
8. Operating System Support: Windows, macOS, Linux
9. Platform, portability: Cross-platform, written in Java
10. Available in (Total languages): Android SDK tools are available in English, but the platform and documentation can be translated into other languages.
11. List of languages Supported: The Android platform supports a wide variety of programming languages, including Java, Kotlin, C++, and more.
12. Type (programming tool, integrated development environment etc.): Software development kit (SDK)
13. Website: https://developer.android.com/
14. Features: The Android SDK includes a range of tools and resources for developing Android applications, including the Android Studio IDE, command-line tools, and emulators. It also includes support for a wide range of Android versions and devices, as well as features such as debugging, profiling, and testing.

15. Size (in MB, GB etc): The size of the Android SDK varies depending on the components and versions installed, but the latest stable release (Android SDK 31.0.0) is around 1.5 GB.
16. Privacy and Security: Google collects data from users of the Android SDK as described in its privacy policy. However, developers can configure the SDK to limit data collection and opt-out of some tracking.
17. Type of Software (Open Source/License): Android SDK is a combination of open-source and proprietary software components, with different licensing terms for different components.
18. If License – provide details: The Android Open Source Project (AOSP) is licensed under the Apache License 2.0, while some proprietary components such as Google Play Services are subject to separate licensing terms.
19. Latest Version: Android SDK 31.0.0
20. Cloud Support (Yes/No): Yes, Android Studio includes support for cloud-based repositories and build services.
21. Applicability: Android SDK is primarily used by developers for developing Android mobile applications.
22. Drawbacks (if any): Android SDK can be complex and difficult to set up and configure, especially for new developers. It may also be resource-intensive, requiring a powerful computer and adequate storage and memory. Additionally, some features and components of the SDK may only be available under certain licensing terms or restrictions.

3) Node.js

1. Original Author: Ryan Dahl
2. Developers: The Node.js project is managed by the OpenJS Foundation, with contributions from a large community of developers.
3. Initial Release: May 27, 2009
4. Stable Release: Node.js 16.14.0 (LTS) released on January 11, 2022
5. Preview Release: Node.js releases often have a "Current" version that includes bleeding-edge features and is intended for developers who want to try out the latest changes before they are stabilized in the LTS release.
6. Repository (with cloud support): Node.js is hosted on GitHub, and many cloud services such as AWS and Microsoft Azure support deploying and running Node.js applications.
7. Written in (Languages): Node.js is written in C++ and JavaScript.
8. Operating System Support: Node.js runs on a wide range of operating systems, including Windows, macOS, Linux, and more.
9. Platform, portability: Cross-platform, written in C++ and JavaScript.
10. Available in (Total languages): Node.js is available in English, but documentation and community resources are available in many languages.
11. List of languages Supported: Node.js applications can be written in JavaScript or other languages that can be transformed into JavaScript, such as TypeScript, Dart, and more.
12. Type (programming tool, integrated development environment etc.): Runtime environment for executing JavaScript code on the server-side

13. Website: https://nodejs.org/
14. Features: Node.js provides a high-performance, event-driven runtime for executing JavaScript code on the server-side, with features such as non-blocking I/O, modules, and a built-in package manager (npm). It also includes support for web development, networking, and other common use cases.
15. Size (in MB, GB etc): The size of Node.js varies depending on the platform and components installed, but the latest LTS release (Node.js 16.14.0) is around 40 MB for the Windows installer.
16. Privacy and Security: The Node.js project follows industry best practices for security and privacy, and regularly releases security updates to address vulnerabilities.
17. Type of Software (Open Source/License): Node.js is open-source software, released under the MIT License.
18. If License – provide details: The MIT License is a permissive open-source license that allows users to use, modify, and distribute the software without restriction, as long as the original license and copyright notice are included.
19. Latest Version: Node.js 16.14.0 (LTS)
20. Cloud Support (Yes/No): Yes, Node.js is widely supported by cloud services and platforms, and many cloud providers offer Node.js hosting and deployment options.
21. Applicability: Node.js is primarily used for server-side web development, but can also be used for other types of applications such as command-line tools, desktop applications, and more.
22. Drawbacks (if any): Node.js can be resource-intensive and may require more memory and processing power than other runtime environments. It may also have a steeper learning curve for developers who are not familiar with JavaScript or server-side programming. Additionally, some developers have criticized Node.js for its callback-based programming model, although this has been largely addressed by the introduction of Promises and async/await syntax in recent versions.

4) DotNet

1. Original Author: Microsoft
2. Developers: The .NET project is managed by Microsoft, with contributions from a large community of developers.
3. Initial Release: February 13, 2002
4. Stable Release: .NET 6.0 released on November 8, 2021
5. Preview Release: .NET releases often have preview versions that include new features and are intended for developers who want to try out the latest changes before they are stabilized in the stable release.
6. Repository (with cloud support): .NET is hosted on GitHub, and many cloud services such as Azure and AWS support deploying and running .NET applications.
7. Written in (Languages): .NET is written primarily in C# and C++.
8. Operating System Support: .NET runs on a wide range of operating systems, including Windows, macOS, Linux, and more.
9. Platform, portability: Cross-platform, written in C# and C++.
10. Available in (Total languages): .NET is available in English, but documentation and community resources are available in many languages.

11. List of languages Supported: .NET supports many languages, including C#, F#, Visual Basic, and more.
12. Type (programming tool, integrated development environment etc.): Framework for building and running software applications
13. Website: https://dotnet.microsoft.com/
14. Features: .NET provides a runtime environment and framework for building and running software applications, with features such as memory management, type safety, and a rich class library. It also includes support for web development, desktop applications, mobile applications, and more.
15. Size (in MB, GB etc): The size of .NET varies depending on the platform and components installed, but the latest release (.NET 6.0) is around 400 MB for the Windows installer.
16. Privacy and Security: The .NET project follows industry best practices for security and privacy, and regularly releases security updates to address vulnerabilities.
17. Type of Software (Open Source/License): .NET is open-source software, released under the MIT License and Apache License 2.0.
18. If License – provide details: The MIT License and Apache License 2.0 are permissive open-source licenses that allow users to use, modify, and distribute the software without restriction, as long as the original license and copyright notice are included.
19. Latest Version: .NET 6.0
20. Cloud Support (Yes/No): Yes, .NET is widely supported by cloud services and platforms, and many cloud providers offer .NET hosting and deployment options.
21. Applicability: .NET is used for a wide range of applications, including web development, desktop applications, mobile applications, gaming, and more.
22. Drawbacks (if any): .NET can be resource-intensive and may require more memory and processing power than other runtime environments. It may also have a steeper learning curve for developers who are not familiar with C# or the .NET framework. Additionally, some developers have criticized .NET for its closed-source components and its ties to the Microsoft ecosystem, although many of these criticisms have been addressed with the move to open-source and cross-platform support in recent versions.

5) Ruby on Rails

1. Original Author: David Heinemeier Hansson (DHH)
2. Developers: Ruby on Rails is an open-source project with contributions from a large community of developers.
3. Initial Release: December 13, 2005
4. Stable Release: Rails 7.0 released on December 6, 2021
5. Preview Release: Rails releases often have release candidate versions that include new features and are intended for developers who want to try out the latest changes before they are stabilized in the stable release.
6. Repository (with cloud support): Ruby on Rails is hosted on GitHub, and many cloud services such as Heroku, AWS, and Google Cloud support deploying and running Ruby on Rails applications.
7. Written in (Languages): Ruby on Rails is written primarily in the Ruby programming language.

8. Operating System Support: Ruby on Rails runs on a wide range of operating systems, including Windows, macOS, and Linux.
9. Platform, portability: Cross-platform, written in Ruby.
10. Available in (Total languages): Ruby on Rails is available in English, but documentation and community resources are available in many languages.
11. List of languages Supported: Ruby on Rails is built on top of the Ruby programming language and supports other languages that can be run on the Ruby Virtual Machine (such as JRuby, which runs on the Java Virtual Machine).
12. Type (programming tool, integrated development environment etc.): Web framework for building and running web applications
13. Website: https://rubyonrails.org/
14. Features: Ruby on Rails provides a framework for building web applications with features such as database integration, RESTful routing, and template rendering. It also includes support for web development best practices such as test-driven development and behavior-driven development.
15. Size (in MB, GB etc): The size of Ruby on Rails varies depending on the platform and components installed, but the latest release (Rails 7.0) is around 10 MB for the gem.
16. Privacy and Security: Ruby on Rails follows industry best practices for security and privacy, and regularly releases security updates to address vulnerabilities.
17. Type of Software (Open Source/License): Ruby on Rails is open-source software, released under the MIT License.
18. If License – provide details: The MIT License is a permissive open-source license that allows users to use, modify, and distribute the software without restriction, as long as the original license and copyright notice are included.
19. Latest Version: Rails 7.0
20. Cloud Support (Yes/No): Yes, Ruby on Rails is widely supported by cloud services and platforms, and many cloud providers offer Ruby on Rails hosting and deployment options.
21. Applicability: Ruby on Rails is used for a wide range of web applications, including social networks, e-commerce sites, and online marketplaces.
22. Drawbacks (if any): Ruby on Rails can be slower than other web frameworks due to the dynamic nature of the Ruby programming language. Additionally, some developers have criticized Ruby on Rails for being overly opinionated and making it difficult to deviate from its conventions, although many developers appreciate the framework's focus on convention over configuration.

6) Anaconda

1. Original Author: Continuum Analytics (now Anaconda, Inc.)
2. Developers: Anaconda is developed by Anaconda, Inc. and has contributions from a large community of developers.
3. Initial Release: 2012
4. Stable Release: Anaconda 2021.11 released on November 30, 2021.
5. Preview Release: Anaconda releases often have release candidate versions that include new features and are intended for developers who want to try out the latest changes before they are stabilized in the stable release.

6. Repository (with cloud support): Anaconda is hosted on GitHub, and many cloud services such as AWS, Azure, and Google Cloud support deploying and running Anaconda environments.
7. Written in (Languages): Anaconda is primarily written in the Python programming language.
8. Operating System Support: Anaconda is supported on a wide range of operating systems, including Windows, macOS, and Linux.
9. Platform, portability: Cross-platform, written in Python.
10. Available in (Total languages): Anaconda is available in English, but documentation and community resources are available in many languages.
11. List of languages Supported: Anaconda is built on top of the Python programming language and supports other languages such as R and Julia.
12. Type (programming tool, integrated development environment etc.): Data science platform that includes a package manager, environment manager, and integrated development environment.
13. Website: https://www.anaconda.com/
14. Features: Anaconda includes a package manager (conda) for managing packages and dependencies, an environment manager for creating and managing isolated Python environments, and an integrated development environment (Spyder) for data analysis and scientific computing. It also includes a wide range of popular data science libraries and tools, such as NumPy, Pandas, and Jupyter Notebook.
15. Size (in MB, GB etc): The size of Anaconda varies depending on the platform and components installed, but the latest release (Anaconda 2021.11) is around 600 MB for the Windows installer.
16. Privacy and Security: Anaconda follows industry best practices for security and privacy, and regularly releases security updates to address vulnerabilities.
17. Type of Software (Open Source/License): Anaconda is open-source software, released under the Apache 2.0 License.
18. If License – provide details: The Apache 2.0 License is a permissive open-source license that allows users to use, modify, and distribute the software without restriction, as long as the original license and copyright notice are included.
19. Latest Version: Anaconda 2021.11
20. Cloud Support (Yes/No): Yes, Anaconda is widely supported by cloud services and platforms, and many cloud providers offer Anaconda hosting and deployment options.
21. Applicability: Anaconda is widely used for data science and scientific computing, and is particularly popular in the fields of machine learning and artificial intelligence.
22. Drawbacks (if any): Anaconda can be resource-intensive and slow to install due to its large size and the number of dependencies it includes. Additionally, some developers have criticized Anaconda for making it difficult to manage environments and dependencies outside of the Anaconda ecosystem.

7) Google colab

1. Original Author: Google
2. Developers: Google
3. Initial Release: 2018
4. Stable Release: Google Colab is a cloud-based service, and updates are automatically rolled out to users as new features and improvements are added.
5. Preview Release: Google occasionally introduces new experimental features in Colab as part of its research initiatives.
6. Repository (with cloud support): Google Colab is hosted on Google Cloud, and users can access their Colab notebooks and files from their Google Drive accounts.
7. Written in (Languages): Google Colab is written in Python.
8. Operating System Support: Google Colab is a cloud-based service and can be accessed from any operating system with a web browser and internet connection.
9. Platform, portability: Cloud-based, accessible from any platform with internet and web browser.
10. Available in (Total languages): Google Colab is primarily available in English, but supports coding in a variety of languages, including Python, R, and Julia.
11. List of languages Supported: Python, R, Julia, and others through the use of third-party libraries and frameworks.
12. Type (programming tool, integrated development environment etc.): Cloud-based integrated development environment (IDE) for data science and machine learning.
13. Website: https://colab.research.google.com/
14. Features: Google Colab offers a free cloud-based computing environment that allows users to write and run code, collaborate with others, and perform data analysis and machine learning tasks using popular Python libraries and frameworks such as TensorFlow and PyTorch. It also includes features for visualization and data exploration.
15. Size (in MB, GB etc): There is no specific size for Google Colab as it is a cloud-based service.
16. Privacy and Security: Google Colab follows Google's strict privacy and security policies and offers end-to-end encryption and other security measures to ensure the privacy and security of users' data.
17. Type of Software (Open Source/License): Google Colab is not open-source software, but it is free to use for anyone with a Google account.
18. If License – provide details: N/A
19. Latest Version: There is no specific version for Google Colab as it is a cloud-based service.
20. Cloud Support (Yes/No): Yes, Google Colab is a cloud-based service that is hosted on Google Cloud.
21. Applicability: Google Colab is widely used in the fields of data science and machine learning, and is particularly useful for researchers and students who need a free and easily accessible computing environment for their work.
22. Drawbacks (if any): Google Colab is a cloud-based service, which means that it requires an internet connection to use. This can be a drawback for users who have limited internet access or who prefer to work offline. Additionally, some users have noted that

the free version of Colab has limited resources, which can be a bottleneck for large and complex machine learning tasks.

8) Django

1. Original Author: Adrian Holovaty and Simon Willison
2. Developers: Django Software Foundation
3. Initial Release: July 2005
4. Stable Release: 4.0.1 (as of February 15, 2023)
5. Preview Release: Django releases alpha and beta versions for new major releases prior to the stable release.
6. Repository (with cloud support): Django's source code is available on GitHub, and there are several cloud platforms that support Django, including Google Cloud Platform, AWS, and Heroku.
7. Written in (Languages): Django is primarily written in Python, with some components written in HTML, JavaScript, and CSS.
8. Operating System Support: Django is a cross-platform framework that can be used on Windows, macOS, and Linux.
9. Platform, portability: Cross-platform and highly portable.
10. Available in (Total languages): Django's primary language is English, but the framework can be used for developing web applications in any language.
11. List of languages Supported: Django can be used with any programming language that can be run on a web server.
12. Type (programming tool, integrated development environment etc.): Web framework for building web applications.
13. Website: https://www.djangoproject.com/
14. Features: Django provides a high-level, model-view-controller (MVC) architecture for developing web applications. It includes a built-in administrative interface, automatic URL routing, and support for interacting with databases. It also has a large ecosystem of third-party packages and libraries for adding additional functionality.
15. Size (in MB, GB etc): The size of Django depends on the version and the components included, but it is generally a few megabytes.
16. Privacy and Security: Django provides built-in security features such as protection against cross-site scripting (XSS) attacks, cross-site request forgery (CSRF) protection, and user authentication and authorization mechanisms. It is also highly customizable to meet specific security needs.
17. Type of Software (Open Source/License): Open-source software released under the BSD license.
18. If License – provide details: BSD License
19. Latest Version: 4.0.1 (as of February 15, 2023)
20. Cloud Support (Yes/No): Yes, Django is supported by several cloud platforms, including Google Cloud Platform, AWS, and Heroku.
21. Applicability: Django is suitable for developing web applications of various scales and complexities, from simple blogs to complex e-commerce platforms and social networks.

22. Drawbacks (if any): Django's learning curve can be steep for those who are new to web development or Python. Additionally, its built-in administrative interface may not be suitable for all projects, and it may require customization for some specific use cases.

9) Vue.js

1. Original Author: Evan You
2. Developers: Vue.js is developed and maintained by its open-source community.
3. Initial Release: February 2014
4. Stable Release: 3.2.26 (as of February 15, 2023)
5. Preview Release: Vue.js releases alpha and beta versions for new major releases prior to the stable release.
6. Repository (with cloud support): Vue.js's source code is available on GitHub, and there are several cloud platforms that support Vue.js, including AWS, Azure, and Google Cloud Platform.
7. Written in (Languages): Vue.js is primarily written in JavaScript, with some components written in HTML and CSS.
8. Operating System Support: Vue.js is a cross-platform framework that can be used on Windows, macOS, and Linux.
9. Platform, portability: Cross-platform and highly portable.
10. Available in (Total languages): Vue.js's primary language is English, but the framework can be used for developing web applications in any language.
11. List of languages Supported: Vue.js can be used with any programming language that can be run on a web server.
12. Type (programming tool, integrated development environment etc.): Front-end JavaScript framework for building user interfaces.
13. Website: https://vuejs.org/
14. Features: Vue.js provides a reactive and composable view layer for building user interfaces. It is highly customizable and can be integrated with other libraries and frameworks. Vue.js also has a rich ecosystem of plugins and tools for building complex web applications.
15. Size (in MB, GB etc): The size of Vue.js depends on the version and the components included, but it is generally a few kilobytes.
16. Privacy and Security: Vue.js is secure and has no known major security vulnerabilities. It is also customizable to meet specific security needs.
17. Type of Software (Open Source/License): Open-source software released under the MIT license.
18. If License – provide details: MIT License
19. Latest Version: 3.2.26 (as of February 15, 2023)
20. Cloud Support (Yes/No): Yes, Vue.js is supported by several cloud platforms, including AWS, Azure, and Google Cloud Platform.
21. Applicability: Vue.js is suitable for developing web applications of various scales and complexities, from simple single-page applications to large-scale web applications.
22. Drawbacks (if any): Vue.js may require more configuration and setup compared to other JavaScript frameworks, and it may have a steeper learning curve for those who are new to front-end web development or JavaScript. Additionally, its ecosystem of

plugins and tools may be smaller compared to other more established frameworks such as React or Angular.

10) Github

1. Original Author: Tom Preston-Werner, Chris Wanstrath, PJ Hyett
2. Developers: GitHub is developed and maintained by its open-source community, as well as its parent company, Microsoft.
3. Initial Release: April 10, 2008
4. Stable Release: GitHub is a web-based platform and does not have a traditional software release cycle.
5. Preview Release: GitHub releases new features and updates on an ongoing basis, and some of these updates may be previewed in beta or experimental versions before being made generally available.
6. Repository (with cloud support): GitHub is a cloud-based platform for hosting and managing software projects, and its source code is available on GitHub itself.
7. Written in (Languages): GitHub is primarily written in Ruby on Rails, with some components written in JavaScript and other languages.
8. Operating System Support: GitHub is a web-based platform and can be accessed from any operating system that has a web browser.
9. Platform, portability: Cross-platform and highly portable.
10. Available in (Total languages): GitHub's primary language is English, but it can be used for managing software projects in any language.
11. List of languages Supported: GitHub can be used with any programming language that can be hosted on a web server or managed in a version control system.
12. Type (programming tool, integrated development environment etc.): GitHub is a web-based platform for hosting and managing software projects, including version control, issue tracking, and collaboration features.
13. Website: https://github.com/
14. Features: GitHub provides a range of features for managing software projects, including version control with Git, issue tracking, pull requests, code review, project management tools, and collaboration features such as wikis and discussions.
15. Size (in MB, GB etc): GitHub does not have a fixed size, as it is a cloud-based platform and can host software projects of various sizes.
16. Privacy and Security: GitHub is designed with security and privacy in mind and provides a range of features for managing access to repositories and protecting sensitive information.
17. Type of Software (Open Source/License): GitHub is a proprietary platform, but it supports open-source software development and provides a range of tools and features for managing open-source projects.
18. If License – provide details: N/A
19. Latest Version: N/A (as GitHub is a web-based platform and does not have a traditional software release cycle)
20. Cloud Support (Yes/No): Yes, GitHub is a cloud-based platform for hosting and managing software projects.

21. Applicability: GitHub is suitable for managing software projects of various scales and complexities, from small personal projects to large-scale open-source projects and enterprise-level software development.
22. Drawbacks (if any): GitHub may have limitations for managing large files or repositories, and it may require a certain level of technical expertise to set up and manage repositories and workflows. Additionally, some users may have concerns about data privacy and security, as GitHub is a cloud-based platform and may store sensitive information on third-party servers.

11) React

1. Original Author: Jordan Walke
2. Developers: React is developed and maintained by Facebook and a community of individual contributors.
3. Initial Release: May 29, 2013
4. Stable Release: 18.2.0 (as of February 15, 2023)
5. Preview Release: React releases new features and updates on an ongoing basis, and some of these updates may be previewed in beta or experimental versions before being made generally available.
6. Repository (with cloud support): React is an open-source project, and its source code is available on GitHub.
7. Written in (Languages): React is primarily written in JavaScript, with JSX as a syntax extension.
8. Operating System Support: React is a web-based library and can be used on any operating system that has a web browser.
9. Platform, portability: Cross-platform and highly portable.
10. Available in (Total languages): React's primary language is English, but it can be used for building user interfaces in any language that can be displayed on a web page.
11. List of languages Supported: React can be used with any programming language that can be displayed on a web page.
12. Type (programming tool, integrated development environment etc.): React is a JavaScript library for building user interfaces, specifically for creating reusable UI components and managing the state of those components.
13. Website: https://reactjs.org/
14. Features: React provides a range of features for building user interfaces, including component-based architecture, virtual DOM, JSX syntax, and state management.
15. Size (in MB, GB etc): The size of a React application depends on the specific components and libraries used in the project, but React itself is a lightweight library and has a small footprint.
16. Privacy and Security: React itself does not handle sensitive data or provide security features, but it is designed with security best practices in mind and can be used to build secure web applications.
17. Type of Software (Open Source/License): React is an open-source library, released under the MIT License.

18. If License – provide details: The MIT License is a permissive license that allows users to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the software.
19. Latest Version: 18.2.0 (as of February 15, 2023)
20. Cloud Support (Yes/No): React is a client-side library and can be used in cloud-based applications, but it does not have native cloud support.
21. Applicability: React is suitable for building user interfaces for web applications of various scales and complexities, from small personal projects to large-scale enterprise applications.
22. Drawbacks (if any): React can have a steep learning curve, especially for developers who are new to component-based architecture and virtual DOM. Additionally, some developers may have concerns about the JSX syntax, which can make the code less readable and harder to debug.

Q2. Implement Linear Regression problem using Google Colab (perform preprocessing, training, testing)

Platform used : Anaconda

Dataset used: https://archive.ics.uci.edu/ml/datasets/Bike+Sharing+Dataset

```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sb
from google.colab import files
import io

uploaded = files.upload()
dataset = pd.read_csv(io.BytesIO(uploaded['day.csv']))
dataset.head()
```

Choose Files day.csv

- **day.csv**(text/csv) - 57569 bytes, last modified: 12/20/2013 - 100% done

Saving day.csv to day.csv

	instant	dteday	season	yr	mnth	holiday	weekday	workingday	weathersit	temp	atemp	hum	windspeed	casual	registered	cnt
0	1	2011-01-01	1	0	1	0	6	0	2	0.344167	0.363625	0.805833	0.160446	331	654	985
1	2	2011-01-02	1	0	1	0	0	0	2	0.363478	0.353739	0.696087	0.248539	131	670	801
2	3	2011-01-03	1	0	1	0	1	1	1	0.196364	0.189405	0.437273	0.248309	120	1229	1349
3	4	2011-01-04	1	0	1	0	2	1	1	0.200000	0.212122	0.590435	0.160296	108	1454	1562
4	5	2011-01-05	1	0	1	0	3	1	1	0.226957	0.229270	0.436957	0.186900	82	1518	1600

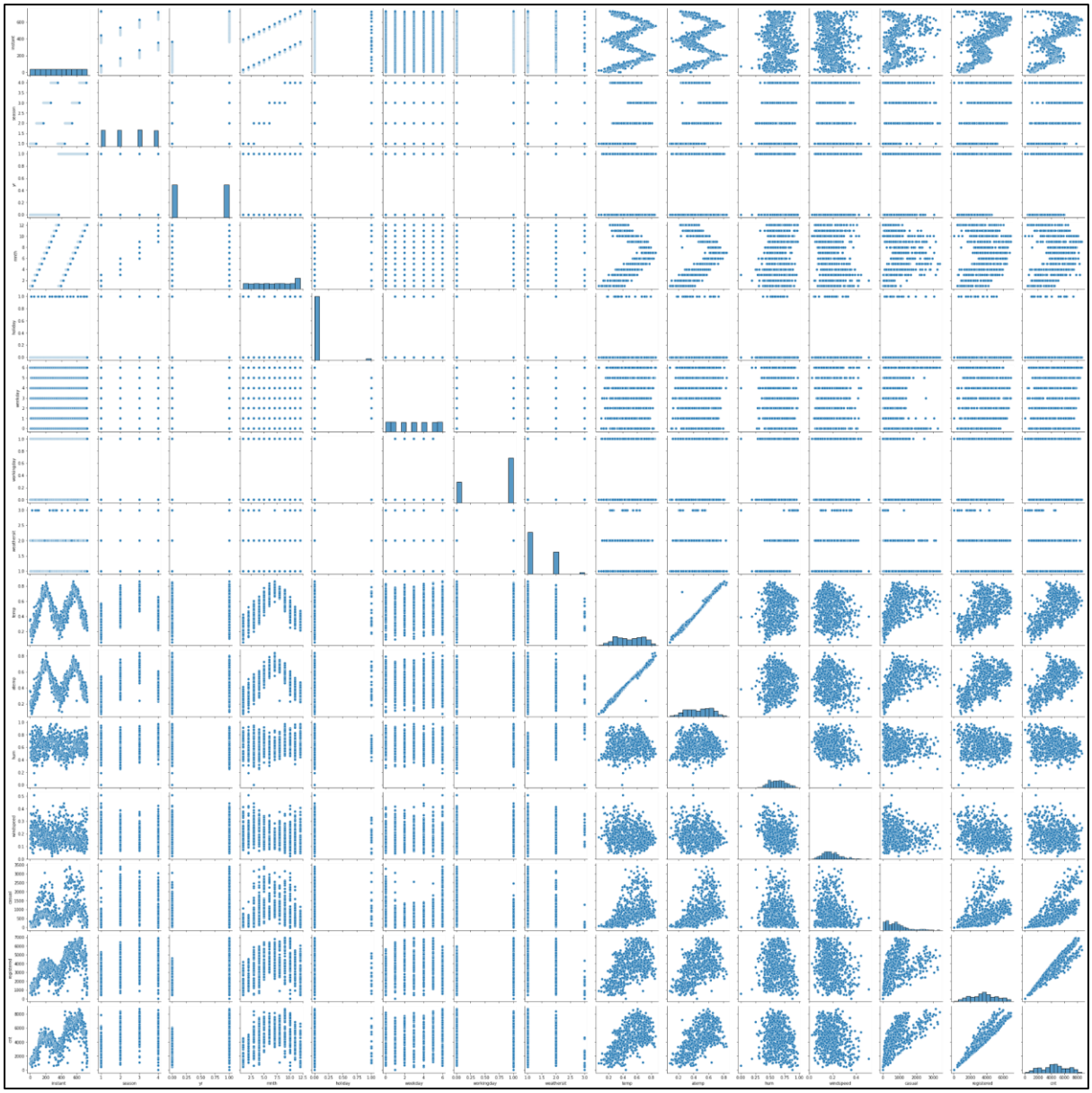
```
dataset.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 731 entries, 0 to 730
Data columns (total 16 columns):
 #   Column      Non-Null Count  Dtype  
---  ------      --------------  -----  
 0   instant     731 non-null    int64  
 1   dteday      731 non-null    object 
 2   season      731 non-null    int64  
 3   yr          731 non-null    int64  
 4   mnth        731 non-null    int64  
 5   holiday     731 non-null    int64  
 6   weekday     731 non-null    int64  
 7   workingday  731 non-null    int64  
 8   weathersit  731 non-null    int64  
 9   temp        731 non-null    float64
 10  atemp       731 non-null    float64
 11  hum         731 non-null    float64
 12  windspeed   731 non-null    float64
 13  casual      731 non-null    int64  
 14  registered  731 non-null    int64  
 15  cnt         731 non-null    int64  
dtypes: float64(4), int64(11), object(1)
memory usage: 91.5+ KB
```

```
dataset.describe()
```

	instant	season	yr	mnth	holiday	weekday	workingday	weathersit	temp	atemp	hum	windspeed	casual	registered	cnt
count	731.000000	731.000000	731.000000	731.000000	731.000000	731.000000	731.000000	731.000000	731.000000	731.000000	731.000000	731.000000	731.000000	731.000000	731.000000
mean	366.000000	2.496580	0.500684	6.519836	0.028728	2.997264	0.683995	1.395349	0.495385	0.474354	0.627894	0.190486	848.176471	3656.172367	4504.348837
std	211.165812	1.110807	0.500342	3.451913	0.167155	2.004787	0.465233	0.544894	0.183051	0.162961	0.142429	0.077498	686.622488	1560.256377	1937.211452
min	1.000000	1.000000	0.000000	1.000000	0.000000	0.000000	0.000000	1.000000	0.059130	0.079070	0.000000	0.022392	2.000000	20.000000	22.000000
25%	183.500000	2.000000	0.000000	4.000000	0.000000	1.000000	0.000000	1.000000	0.337083	0.337842	0.520000	0.134950	315.500000	2497.000000	3152.000000
50%	366.000000	3.000000	1.000000	7.000000	0.000000	3.000000	1.000000	1.000000	0.498333	0.486733	0.626667	0.180975	713.000000	3662.000000	4548.000000
75%	548.500000	3.000000	1.000000	10.000000	0.000000	5.000000	1.000000	2.000000	0.655417	0.608602	0.730209	0.233214	1096.000000	4776.500000	5956.000000
max	731.000000	4.000000	1.000000	12.000000	1.000000	6.000000	1.000000	3.000000	0.861667	0.840896	0.972500	0.507463	3410.000000	6946.000000	8714.000000

```
sb.pairplot(dataset)
```

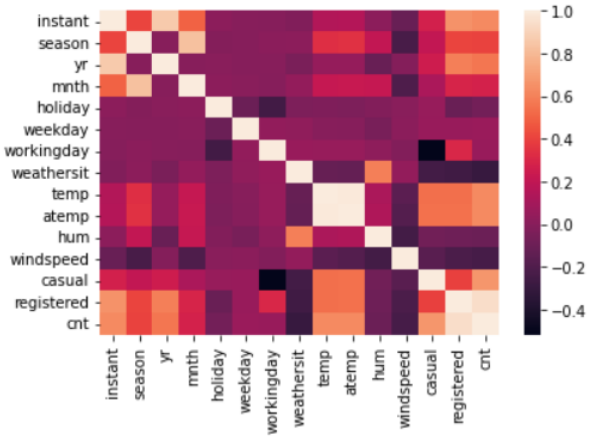


```
dataset.corr()
```

	instant	season	yr	mnth	holiday	weekday	workingday	weathersit	temp	atemp	hum	windspeed	casual	registered	cnt
instant	1.000000	0.412224	0.866025	0.496702	0.016145	-0.000016	-0.004337	-0.021477	0.150580	0.152638	0.016375	-0.112620	0.275255	0.659623	0.628830
season	0.412224	1.000000	-0.001844	0.831440	-0.010537	-0.003080	0.012485	0.019211	0.334315	0.342876	0.205445	-0.229046	0.210399	0.411623	0.406100
yr	0.866025	-0.001844	1.000000	-0.001792	0.007954	-0.005461	-0.002013	-0.048727	0.047604	0.046106	-0.110651	-0.011817	0.248546	0.594248	0.566710
mnth	0.496702	0.831440	-0.001792	1.000000	0.019191	0.009509	-0.005901	0.043528	0.220205	0.227459	0.222204	-0.207502	0.123006	0.293488	0.279977
holiday	0.016145	-0.010537	0.007954	0.019191	1.000000	-0.101960	-0.253023	-0.034627	-0.028556	-0.032507	-0.015937	0.006292	0.054274	-0.108745	-0.068348
weekday	-0.000016	-0.003080	-0.005461	0.009509	-0.101960	1.000000	0.035790	0.031087	-0.000170	-0.007537	-0.052232	0.014282	0.059923	0.057367	0.067443
workingday	-0.004337	0.012485	-0.002013	-0.005901	-0.253023	0.035790	1.000000	0.061200	0.052660	0.052182	0.024327	-0.018796	-0.518044	0.303907	0.061156
weathersit	-0.021477	0.019211	-0.048727	0.043528	-0.034627	0.031087	0.061200	1.000000	-0.120602	-0.121583	0.591045	0.039511	-0.247353	-0.260388	-0.297391
temp	0.150580	0.334315	0.047604	0.220205	-0.028556	-0.000170	0.052660	-0.120602	1.000000	0.991702	0.126963	-0.157944	0.543285	0.540012	0.627494
atemp	0.152638	0.342876	0.046106	0.227459	-0.032507	-0.007537	0.052182	-0.121583	0.991702	1.000000	0.139988	-0.183643	0.543864	0.544192	0.631066
hum	0.016375	0.205445	-0.110651	0.222204	-0.015937	-0.052232	0.024327	0.591045	0.126963	0.139988	1.000000	-0.248489	-0.077008	-0.091089	-0.100659
windspeed	-0.112620	-0.229046	-0.011817	-0.207502	0.006292	0.014282	-0.018796	0.039511	-0.157944	-0.183643	-0.248489	1.000000	-0.167613	-0.217449	-0.234545
casual	0.275255	0.210399	0.248546	0.123006	0.054274	0.059923	-0.518044	-0.247353	0.543285	0.543864	-0.077008	-0.167613	1.000000	0.395282	0.672804
registered	0.659623	0.411623	0.594248	0.293488	-0.108745	0.057367	0.303907	-0.260388	0.540012	0.544192	-0.091089	-0.217449	0.395282	1.000000	0.945517
cnt	0.628830	0.406100	0.566710	0.279977	-0.068348	0.067443	0.061156	-0.297391	0.627494	0.631066	-0.100659	-0.234545	0.672804	0.945517	1.000000

```
sb.heatmap(dataset.corr())
```

```
<matplotlib.axes._subplots.AxesSubplot at 0x7fb54ef273a0>
```




```
[8] X=dataset[['instant','season','yr','mnth','holiday','weekday','workingday','weathersit','temp','atemp','hum','windspeed','casual','registered']]
    Y=dataset['cnt']
```

```
from sklearn.model_selection import train_test_split
X_train,X_test,Y_train,Y_test=train_test_split(X,Y,test_size=0.3,random_state=100)
```

```
[10] from sklearn.linear_model import LinearRegression
     lr=LinearRegression()
     lr.fit(X_train,Y_train)
```

```
LinearRegression()
```

```
df_coef=pd.DataFrame(lr.coef_,X.columns,columns=['Coefficient'])
print(df_coef)
```

```
              Coefficient
instant     4.738714e-15
season     -2.209344e-13
yr         -1.414860e-13
mnth        5.214947e-14
holiday    -3.926801e-13
weekday    -2.014278e-14
workingday  3.583365e-14
weathersit  1.603072e-13
temp        2.574499e-14
atemp      -1.812220e-14
hum         2.897735e-13
windspeed  -4.734845e-13
casual      1.000000e+00
registered  1.000000e+00
```