

# **Software Engineering Tools Lab**

## **Assignment no. 2**

Name: Somesh Sharma

PRN: 2020BTECS00008

**Q.1.** List of Frameworks/IDEs/Softwares

- a. Eclipse
- b. Android SDK
- c. Node.Js
- d. DotNet
- e. Ruby on Rails
- f. Anaconda
- g. Google colab
- h. Django
- i. Vue.js
- j. GitHub
- k. React

For every Frameworks/IDEs/Softwares given above provide the answers for below questions

- 1. Original author
- 2. Developers
- 3. Initial release

4. Stable release
5. Preview release
6. Repository (with cloud support )
7. Written in (Languages)
8. Operating System support
9. Platform ,portability
10. Available in (Total languages)
11. List of languages supported
12. Type (Programming tool, integrated development environment etc.)
13. Website
14. Features
15. Size (in MB, GB etc.)
16. Privacy and Security
17. Type of software (Open source/License)
18. If License- Provide details.
19. Latest version
20. Cloud support (Yes/No)
21. Applicability
22. Drawbacks (if any)

Ans:

**a. Eclipse**

1. Original authors : IBM
2. Developers : Mik Kersten, Eclipse foundation
3. Initial release : Version 1.0 - 29 November 2001
4. Stable release : Version 4.26.0 – 7 December 2022
5. Preview release : 4.27 – (2023-03 release)
6. Repository with cloud support : [emfcloud](#), [emfcloud-modelserver-theia](#)
7. Written in (Languages): Java and C
8. Operating system support : Linux, macOS, Windows
9. Platform, portability : Java SE, Standard Widget Toolkit, x86-64
10. Available in (Total languages) : Ada, ABAP, C, C++, C#, Clojure, COBOL, D, Erlang, Fortran, Groovy, Haskell, JavaScript, Julia, Lasso, Lua, NATURAL, Perl, PHP, Prolog, Python, R, Ruby, Rust, Scala, and Scheme.
11. List of languages supported : C, C++, Perl, Python, Ruby, PHP, Java, etc.
12. Type (Programming tool, integrated development environment etc.) : integrated development environment
13. Website : <https://www.eclipse.org/>
14. Features : GUI, code development, code editing, debugging, data modelling, web/android app development, etc.
15. Size : 120 MB
16. Privacy and security : Will not sell Personal Information to any third party, will not disclose your Personal Information, except as described in the Privacy Policy. Personal Information may be shared among the Eclipse entities within the Eclipse Group.
17. Type of software (Open source/License) : Open source
18. If License- Provide details. : -
19. Latest version : 2023-03 M1
20. Cloud support (Yes/No) : Yes

21. Applicability : code development, data modelling, web/android app development, etc.
22. Drawbacks (if any) : -

### **b. Android SDK**

1. Original author : Google
2. Developers : Google
3. Initial release : 12 Nov 2007
4. Stable release : Jan 2021
5. Preview release
6. Repository (with cloud support ) : github (with support for Google Cloud and Amazon Web Services)
7. Written in (Languages) : Java, C++, and XML
8. Operating System support : Windows, macOS, and Linux
9. Platform ,portability : cross platform
10. Available in (Total languages) : varies based on API level, supports multiple languages
11. List of languages supported : Java, Kotlin, C++, and XML
12. Type (Programming tool, integrated development environment etc.) : IDE, SDK.
13. Website : [developer.android.com](https://developer.android.com)
14. Features : Emulator, Debugging tools, Libraries, APIs, Sample Code, and Documentation
15. Size (in MB, GB etc.) : approx. 4GB
16. Privacy and Security : Google releases regular security updates, user must follow best practices for secure development
17. Type of software (Open source/License) : Open-source, under the Apache License 2.0
18. If License- Provide details : Apache License 2.0 is a permissive free software license that allows for reuse within proprietary software provided all copies of the licensed software include a copy of the Apache License terms and the copyright notice.
19. Latest version : 30.0.4

20. Cloud support (Yes/No) : Yes
21. Applicability : Mobile Application Development for the Android Operating System
22. Drawbacks (if any) : Learning curve for new developers, fragmentation across different Android versions and devices, and slow release cycle for new features.

### c. Node.js

1. Original author: Ryan Dahl
2. Developers: Node.js Foundation, various individual contributors
3. Initial release: May 27, 2009
4. Stable release: 15.9.0 (January 2021)
5. Preview release: Not applicable
6. Repository (with cloud support): GitHub (with support for multiple cloud platforms)
7. Written in (Languages): JavaScript and C++
8. Operating System support: Windows, macOS, Linux, Unix, and more
9. Platform, portability: Cross-platform
10. Available in (Total languages): JavaScript
11. List of languages supported: JavaScript
12. Type: Server-side JavaScript Environment, Application Server, Backend Technology
13. Website: nodejs.org
14. Features: Event-driven, Asynchronous I/O, Lightweight, Fast, Scalable, and Single-threaded
15. Size (in MB, GB etc.): Typically around 40 MB
16. Privacy and Security: Regular security updates, user must follow best practices for secure development
17. Type of software (Open source/License): Open-source, under the MIT License

18. If License- Provide details: The MIT License is a permissive free software license that allows for reuse within proprietary software provided all copies of the licensed software include a copy of the MIT License terms and the copyright notice.
19. Latest version: 15.9.0
20. Cloud support (Yes/No): Yes
21. Applicability: Server-side Web Application Development, Network Applications, IoT, and Backend Services
22. Drawbacks (if any): Steep learning curve for beginners, not suitable for CPU-bound tasks, and callback hell (lack of error handling).

#### **d. DotNet**

1. Original author: Microsoft Corporation
2. Developers: Microsoft, .NET Community
3. Initial release: February 13, 2002
4. Stable release: 6.0 (November 10, 2020)
5. Preview release: Not applicable
6. Repository (with cloud support): GitHub (with support for Microsoft Azure cloud platform)
7. Written in (Languages): C#, F#, Visual Basic .NET (VB.NET), and others
8. Operating System support: Windows, macOS, and Linux (through .NET Core)
9. Platform, portability: Cross-platform (with .NET Core)
10. Available in (Total languages): Multiple
11. List of languages supported: C#, F#, Visual Basic .NET (VB.NET), and others
12. Type: Software Framework, Development Platform
13. Website: [dotnet.microsoft.com](https://dotnet.microsoft.com)

14. Features: Object-Oriented Programming, Garbage Collection, Type Safety, Portability, Interoperability, Standard Library, and others
15. Size (in MB, GB etc.): Depends on the installation type, typically around 500 MB to 1 GB
16. Privacy and Security: Regular security updates, Microsoft follows strict security practices, user must follow best practices for secure development
17. Type of software (Open source/License): Open-source, under the MIT and Apache 2.0 licenses
18. If License- Provide details: The .NET platform is open-sourced under the MIT and Apache 2.0 licenses, which are permissive free software licenses that allow for reuse within proprietary software provided all copies of the licensed software include a copy of the license terms and the copyright notice.
19. Latest version: 6.0
20. Cloud support (Yes/No): Yes
21. Applicability: Windows desktop applications, Windows store apps, Web applications, Cloud services, Games, Mobile apps (through Xamarin), and others
22. Drawbacks (if any): Steep learning curve for beginners, not as widely adopted as some other software platforms, legacy code and compatibility issues with newer versions

#### **e. Ruby on Rails**

1. Original author: David Heinemeier Hansson
2. Developers: Rails Core Team, Contributors, and Community
3. Initial release: December 13, 2005
4. Stable release: 6.1.3 (January 25, 2021)
5. Preview release: 6.2.0.rc2 (January 27, 2021)
6. Repository (with cloud support): GitHub (with Heroku, AWS, and Google Cloud support)

7. Written in (Languages): Ruby
8. Operating System support: Windows, macOS, and Linux
9. Platform, portability: Cross-platform
10. Available in (Total languages): 1 (Ruby)
11. List of languages supported: Ruby
12. Type: Server-side web application framework
13. Website: [rubyonrails.org](http://rubyonrails.org)
14. Features: MVC pattern, ORM, Routing, Templating, Asset pipeline, and Middleware
15. Size (in MB, GB etc.): varies based on application size, framework is lightweight
16. Privacy and Security: security patches and updates are regularly released, user should follow best practices for secure development
17. Type of software (Open source/License): Open-source, under the MIT License
18. If License- Provide details: MIT License is a permissive free software license that allows for reuse within proprietary software provided all copies of the licensed software include a copy of the MIT License terms and the copyright notice.
19. Latest version: 6.1.3
20. Cloud support (Yes/No): Yes
21. Applicability: Web development, Content Management Systems, E-commerce Applications, etc.
22. Drawbacks (if any): Performance issues with large and complex applications, Steep learning curve for beginners, and some features may be over-complicated for simple projects.

#### **f. Anaconda**

1. Original author: Continuum Analytics, Inc.
2. Developers: Anaconda, Inc.



3. Initial release: 2012
4. Stable release: Latest version
5. Preview release: N/A
6. Repository (with cloud support):  
<https://anaconda.org/anaconda/repo>, Anaconda Cloud
7. Written in (Languages): Python, R
8. Operating System support: Windows, macOS, Linux
9. Platform, portability: Cross-platform
10. Available in (Total languages): N/A
11. List of languages supported: Python, R
12. Type (Programming tool, integrated development environment etc.): Distribution of Python and R for data science and machine learning
13. Website: <https://www.anaconda.com/>
14. Features: Package management and deployment, integrated development environment (Spyder), Jupyter notebooks, hundreds of pre-installed packages for data science and machine learning
15. Size (in MB, GB etc.): Depending on the installation options, anywhere from a few hundred MBs to a few GBs
16. Privacy and Security: Anaconda is committed to protecting user privacy and maintaining the security of the platform and its users' data.
17. Type of software (Open source/License): Open-source with a commercial license option
18. If License- Provide details: Anaconda is available under the open-source BSD license, but also offers a commercial license for businesses and organizations.
19. Latest version: N/A (check the official website for the latest version)
20. Cloud support (Yes/No): Yes
21. Applicability: For data science, machine learning, and scientific computing.

22. Drawbacks (if any): Some users may find the size of the distribution to be large, and may have difficulty configuring it for specific use cases

#### **g. Google colab**

1. Original author: Google
2. Developers: Google
3. Initial release: April 13, 2012
4. Stable release: Ongoing
5. Preview release: None
6. Repository: Google
7. Written in (Languages): Python, JavaScript, etc.
8. Operating System support: Web-based, accessible from any device with an internet connection
9. Platform, portability: Cloud-based, accessible from any device with an internet connection
10. Available in (Total languages): 1 (English)
11. List of languages supported: English
12. Type: Cloud-based integrated development environment
13. Website: <https://colab.research.google.com/>
14. Features: Notebook interface, code execution, data analysis, visualization, collaboration, and integration with Google Drive and Google Cloud Storage
15. Size (in MB, GB etc.): No required installation, uses cloud storage for data and files
16. Privacy and Security: Google's privacy and security policies apply
17. Type of software (Open source/License): Closed source, proprietary software
18. If License- Provide details: N/A
19. Latest version: Ongoing, regularly updated
20. Cloud support (Yes/No): Yes
21. Applicability: Data analysis, machine learning, research and development, collaboration, education, etc.

22. Drawbacks (if any): Limited local storage, dependent on an internet connection, limited support for certain packages, limited control over the hardware.

#### **h. Django**

1. Original author: Adrian Holovaty and Simon Willison
2. Developers: Django Software Foundation
3. Initial release: July 2005
4. Stable release: 3.2.1 (2022-12-06)
5. Preview release: N/A
6. Repository: GitHub (django/django) with cloud support (AWS, Heroku, etc.)
7. Written in: Python
8. Operating System support: Cross-platform
9. Platform: Web application development
10. Available in: English
11. List of languages supported: English
12. Type: Web framework, High-level Python web framework
13. Website: <https://www.djangoproject.com/>
14. Features: Dynamic administrative interface, ORM, MVC architecture, URL routing, Templates, Security, Scalability, and Extendibility
15. Size: MB (depends on the installation size)
16. Privacy and Security: Django provides protection against common web attacks, protection for sensitive information like passwords, and several other security features.
17. Type of software: Open source
18. If License- Provide details: BSD 3-Clause License
19. Latest version: 3.2.1 (2022-12-06)
20. Cloud support: Yes
21. Applicability: Django can be used for building web applications, CMS, e-commerce sites, and more.

22. Drawbacks (if any): Steep learning curve for beginners, heavy server requirements, more time-consuming than some other web frameworks, large applications may slow down.

#### i. Vue.js

1. Original author: Evan You
2. Developers: Evan You, the Vue.js core team and community of contributors
3. Initial release: February 2014
4. Stable release: v3.7.0 (January 2022)
5. Preview release: N/A
6. Repository (with cloud support ):  
<https://github.com/vuejs/vue>
7. Written in (Languages): JavaScript
8. Operating System support: Cross-platform
9. Platform, portability: Web platform
10. Available in (Total languages): N/A
11. List of languages supported: JavaScript
12. Type (Programming tool, integrated development environment etc.): JavaScript framework for building user interfaces
13. Website: <https://vuejs.org/>
14. Features: Reactive and composable components, reactivity system, virtual DOM, template-based syntax, directives, event handling, and more
15. Size (in MB, GB etc.): Approximately 20-30KB minified and gzipped
16. Privacy and Security: No information available.
17. Type of software (Open source/License): Open source, MIT license
18. If License- Provide details: The MIT License is a permissive free software license originating at the Massachusetts Institute of Technology (MIT). It allows the reuse of software released under the license in source and

binary forms, without needing to provide source code to the users.

19. Latest version: v3.7.0
20. Cloud support (Yes/No): N/A
21. Applicability: Developing dynamic web applications and building user interfaces.
22. Drawbacks (if any ): Steep learning curve for new developers, limitations in customizing advanced functionality, requires a separate library for state management.

#### j. GitHub

1. Original author: Tom Preston-Werner, Chris Wanstrath, and PJ Hyett
2. Developers: Microsoft
3. Initial release: February 2008
4. Stable release: Continuous
5. Preview release: N/A
6. Repository (with cloud support): GitHub, GitHub Enterprise
7. Written in (Languages): Ruby, JavaScript, Elixir
8. Operating System support: Web-based, macOS, Windows, Linux
9. Platform ,portability: Cross-platform
10. Available in (Total languages): N/A
11. List of languages supported: Over 100 programming languages
12. Type (Programming tool, integrated development environment etc.): Web-based hosting service for version control and collaboration using Git.
13. Website: <https://github.com/>
14. Features: Code review, Project management, Documentation, Issue tracking, Continuous integration and deployment, etc.
15. Size (in MB, GB etc.): N/A

16. Privacy and Security: Encryption, 2-factor authentication, auditing, and other security features.
17. Type of software (Open source/License): Proprietary
18. If License- Provide details: N/A
19. Latest version: Continuous
20. Cloud support (Yes/No): Yes
21. Applicability: Software development, version control, and collaboration
22. Drawbacks (if any ): Limited features in the free version, private repositories require a paid subscription.

#### **k. React**

1. Original author: Jordan Walke, a software engineer at Facebook
2. Developers: Facebook, Instagram
3. Initial release: May 2013
4. Stable release: 17.0.2 (Jan 2021)
5. Preview release: Not applicable
6. Repository: <https://github.com/facebook/react> (with cloud support through various platforms including Heroku, AWS, and Firebase)
7. Written in: JavaScript
8. Operating System support: Cross-platform
9. Platform, portability: Web, Native (React Native)
10. Available in: 1 (JavaScript)
11. List of languages supported: JavaScript
12. Type: JavaScript Library for building user interfaces
13. Website: <https://reactjs.org/>
14. Features: Virtual DOM, Reactive and composable components, Server-side rendering, JSX syntax
15. Size: Minified version is around 6 KB
16. Privacy and Security: Follows industry standard security practices, developers are responsible for ensuring secure usage

17. Type of software: Open source, Licensed under MIT License
18. If License: MIT License, a permissive open-source license that allows for modification and distribution of the software
19. Latest version: 17.0.2
20. Cloud support: Yes (through various platforms including Heroku, AWS, and Firebase)
21. Applicability: Building complex and large-scale web applications, cross-platform mobile application development (React Native)
22. Drawbacks: Steep learning curve for beginners, Higher complexity in larger projects, Need to regularly keep up with updates.

**Q.2.** Implement linear regression problem using Google colab (Perform preprocessing, training and testing) Node.Js, Android SDK , Dot Net, Ruby on Rails, Anaconda,Eclipse Use any of one following appropriate dataset.

Dataset 1- <https://www.kaggle.com/spittman1248/cdc-data-nutrition-physical-activity-obesity>

Dataset 2- <https://archive.ics.uci.edu/ml/datasets/Air+Quality>

Dataset 3-

<https://archive.ics.uci.edu/ml/datasets/Appliances+energy+prediction>

Dataset 4-

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

Dataset 5-

<https://archive.ics.uci.edu/ml/datasets/Demand+Forecasting+for+a+store>

Dataset 6-

<https://archive.ics.uci.edu/ml/datasets/Hungarian+Chickenpox+Cases>

Dataset 7-

<https://archive.ics.uci.edu/ml/datasets/KDD+Cup+1998+Data>

Dataset 8-

<https://archive.ics.uci.edu/ml/datasets/Water+Quality+Prediction>

Ans:

Using dataset 3:

```
import pandas as pd
import numpy as np
from sklearn.model_selection import train_test_split
from google.colab import drive
drive.mount("/content/gdrive")
```

**Output:**

Mounted at /content/gdrive

```
import pandas as pd
data=pd.read_csv('/content/gdrive/My Drive/energydata_complete.csv')
x = data.iloc[:, 1].values
y = data.iloc[:, 2].values
x = x.reshape(-1,1)
X_train, X_test, y_train, y_test = train_test_split(x, y, test_size=0.2, random_state=0)
```

```
from sklearn.linear_model import LinearRegression
regressor = LinearRegression()
regressor.fit(X_train, y_train)
```



### **Output:**

```
LinearRegression()
```

```
from sklearn.metrics import mean_squared_error, r2_score
y_pred = regressor.predict(X_test)
mse = mean_squared_error(y_test, y_pred)
r2 = r2_score(y_test, y_pred)
print('Mean Squared Error:', mse)
print('R-Squared Score:', r2)
```

### **Output:**

```
Mean Squared Error: 60.653250410961824
R-Squared Score: 0.03204507312679328
```

```
import matplotlib.pyplot as plt
import numpy as np
from sklearn.linear_model import LinearRegression
reg = LinearRegression().fit(x, y)
plt.scatter(x, y, color='blue')
plt.plot(x, reg.predict(x), color='red')
plt.xlabel('Independent variable')
plt.ylabel('Dependent variable')
plt.title('Linear Regression')
plt.show()
```

## Output:

