

Software Engineering Tools Lab

Assignment No-2

Module 2- Software Development Frameworks

PRN : 2020BTECS00079

Batch : T7

Eclipse:

- 1) Original author : IBM
- 2) Developers : Eclipse Foundation
- 3) Initial release : November 2001
- 4) Stable release : 2022-06 (Eclipse 4.17)
- 5) Preview release : 26 June 2006
- 6) Repository (with cloud support) : <https://www.eclipse.org/downloads/>
- 7) Written in (Languages) : Java and C
- 8) Operating System support : Windows, macOS, Linux
- 9) Platform ,portability : Cross-platform
- 10) Available in (Total languages) : 44 languages
- 11) List of languages supported : C, C++, C#, Clojure, COBOL, D, Erlang, Fortran, Groovy, Haskell, JavaScript, Julia, Lasso, Lua, NATURAL, Perl, PHP
- 12) Type (Programming tool, integrated development environment etc.)
- 13) Website : <https://www.eclipse.org/>
- 14) Features : Coding Shortcuts , Autocorrection , Refactoring , Diffing Files , Organizing Imports, Formatting Source Code
- 15) Size (in MB, GB etc.) : 182 MB
- 16) Privacy and Security : <https://www.eclipse.org/legal/privacy.php>
- 17) Type of software (Open source/License) : Open Source
- 18) If License- Provide details.
- 19) Latest version : Eclipse 4.23 (2022-03)
- 20) Cloud support (Yes/No) : No
- 21) Applicability : integrated development environment
- 22) Drawbacks (if any):

Android SD:

- 1) Original author: Google
- 2) Developers: Google, Open Handset Alliance, and Android Community
- 3) Initial release: November 5, 2007
- 4) Stable release: 30.0.4 (January 2021)
- 5) Preview release: Not applicable
- 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: Integrated Development Environment (IDE), SDK
- 13) Website: developer.android.com
- 14) Features: Emulator, Debugging tools, Libraries, APIs, Sample Code, and Documentation
- 15) Size (in MB, GB etc.): varies based on installation, typically around 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.

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 only): Steep learning curve for beginners, not suitable for CPU-bound tasks, and callback hell (lack of error handling).

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
- 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

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
- 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.

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

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.

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.

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.

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.

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.

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

```
import pandas as pd
import numpy as np
from sklearn.model_selection import train_test_split

# Load the dataset
# Dataset 3-
https://archive.ics.uci.edu/ml/datasets/Appliances+energy+prediction
# Appliances energy prediction Data Set
data = pd.read_csv('energydata_complete.csv')
# Clean the data
data.dropna(inplace=True)

# Split the data into training and testing sets
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)

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
# Train the linear regression model
regressor = LinearRegression()
regressor.fit(X_train, y_train)
```

```
from sklearn.metrics import mean_squared_error, r2_score
# Predict the target values for the testing data
y_pred = regressor.predict(X_test)
# Evaluate the model performance
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)
```

```
!pip install matplotlib
```

```
import matplotlib.pyplot as plt
import numpy as np
from sklearn.linear_model import LinearRegression
```

```
# Fitting the model
reg = LinearRegression().fit(x, y)
```

```
# Independent variable : Appliances
# Dependent variable : Light
# Plotting the data and regression line
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()
```

