2020BTECS00106

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Batch – T8

Software Engineering Tools Lab

Assignment No. 2

List of Frameworks/IDEs/Software

1. Eclipse

i. Original author: IBM

ii. Developers: Eclipse Foundation

iii. Initial release: 1.0 / 29 November 2001

iv. Stable release: 4.26.0 / 7 December 2022

v. Preview release: 15 March 2023

vi. Repository (with cloud support):

vii. Written in (Languages) :Java and C language

viii. OS support: Eclipse is a cross-platform software and can run on the following operating systems -

a. Windows: Windows 7 or later (32-bit or 64-bit)

b. macOS: macOS 10.15 (Catalina) or later (64-bit)

c. Linux: Linux distributions that support GTK 3, including Ubuntu and Fedora (64-bit)

ix. Platform, portability: Eclipse is a cross-platform software platform that can run on various operating

systems including Windows, macOS, and Linux. This means that developers can use the same

development environment on different systems, which can improve productivity and reduce the

need to switch between different tools.

x. Available in (Total languages) : Java , C/C++, Python, PHP, Scala ,Perl ,Groovy

xi. List of languages supported : Java , C/C++, Python, PHP, Ruby ,Perl ,Groovy ,XML

xii. Type (Programming tool, integrated development environment etc.)

xiii. Website: https://www.eclipse.org/

xiv. Features:

a. Code Editing: Eclipse provides an advanced code editor with features such as code highlighting,

code folding, and automatic indentation, making it easier to write and maintain code.

b. Debugging: Eclipse includes a comprehensive debugging environment that allows developers to

step through code, set breakpoints, inspect variables, and view the call stack.

c. Code Refactoring: Eclipse provides code refactoring tools that help developers restructure and

improve the quality of their code, making it easier to maintain and evolve over time.

xv. Size (in MB, GB etc.): 182 MB

xvi. Privacy and Security: Eclipse is an open-source software platform, and as such, the privacy and

security of the software is dependent on the community of contributors who maintain and develop

the platform. In general, open-source software has the potential to be more secure than proprietary

software, as the code is available for review by the community

xvii. Type of software (Open source/License)

xviii. If License - Provide details: Eclipse is an open-source software platform and is released under the

Eclipse Public License (EPL). The EPL is a free software license that allows users to use, modify,

and distribute the software for any purpose, commercial or non-commercial.

xix. Latest version: 4.11(2019-03)

xx. Cloud support (Yes/No): Eclipse does not have its own cloud support but it can be run on cloud

platforms such as Amazon Web Services (AWS) and Microsoft Azure.

xxi. Applicability:

a. Java Development: Eclipse is particularly well-suited for Java development, and provides a

range of tools and plugins specifically designed for this purpose, including a Java development

kit, code refactoring tools, and integrated debugging.

b. Web Development: Eclipse can be used for web development, with support for HTML, CSS,

JavaScript, and other web technologies.

c. Mobile Development: Eclipse supports mobile development, with tools for developing Android

apps, and plugins for other mobile platforms.

xxii. Drawbacks (if any):

a. Resource Intensive: Eclipse can be resource-intensive and may require a powerful computer,

especially when working with large projects or running multiple plugins.

b. Complexity: Eclipse can be complex to set up and use, especially for new users, and may

require a learning curve to master all its features and plugins.

c. Slow Performance: Eclipse can be slow at times, particularly when working with large projects

or using multiple plugins, which can impact productivity.

2. Android SDK

i. Original author: Google

ii. Developers: Google, Android Open Source Project

iii. Initial release: 2008

iv. Stable release: 31.0.2 (February 2022)

v. Preview release: N/A

vi. Repository (with cloud support): https://android.googlesource.com/

vii. Written in (Languages): Java, C++, XML

viii. Operating System support: Windows, Mac OS X, Linux

ix. Platform, portability: Mobile operating system, cross-platform

x. Available in (Total languages): Multiple

xi. List of languages supported: See https://developer.android.com/studio/languages/index.html

xii. Type (Programming tool, integrated development environment etc.): Integrated Development

Environment (IDE), Software Development Kit (SDK)

xiii. Website: https://developer.android.com/sdk

xiv. Features: Android emulator, integrated development environment, debuggers, libraries, sample

code, system image, tools for debugging, performance optimization, and more

xv. Size (in MB, GB etc.): Approximately 1 GB

xvi. Privacy and Security: Depends on the security measures implemented by the developer.

xvii. Type of software (Open source/License): Open source

xviii. If License- Provide details: Android SDK is released under the Apache License 2.0

xix. Latest version: 31.0.2 (February 2022)

xx. Cloud support (Yes/No): No

xxi. Applicability: Developing Android applications

xxii. Drawbacks (if any): Initial setup and installation can be complicated and time-consuming. Some

components of the SDK may be outdated and require manual updates.

3. NodeJs

i. Original author: Ryan Dahl

ii. Developers: OpenJS Foundation

iii. Initial release: 2009

iv. Stable release: v14.16.0 (2022-12-08)

v. Preview release: v15.0.0 (2022-10-19)

vi. Repository (with cloud support): https://github.com/nodejs/node

vii. Written in (Languages): JavaScript and C++

viii. Operating System support: Windows, macOS, Linux, and Unix

ix. Platform, portability: Cross-platform

x. Available in (Total languages): Not specified

xi. List of languages supported: JavaScript

xii. Type (Programming tool, integrated development environment etc.): JavaScript runtime environment

xiii. Website: https://nodejs.org/

xiv. Features:

 Asynchronous event-driven programming

 Support for multiple programming paradigms (e.g. procedural, functional, and object-oriented)

 Built-in modules for various tasks (e.g. HTTP, file system, and cryptography)

 Large, active community and robust ecosystem with numerous packages available.

 Can be used with popular frontend frameworks such as React and Angular.

xv. Size (in MB, GB etc.): Not specified

xvi. Privacy and Security: Open source and third-party packages may have vulnerabilities. It is up to the

developers to keep their applications secure.

xvii. Type of software (Open source/License): Open Source, licensed under the MIT License.

xviii. Applicability:

a. IoT

b. Real-Time Chats

c. Complex Single-Page Apps

d. Streaming Apps

xix. Drawbacks:

a. Reduces performance when handling Heavy Computing Tasks

b. Node.js invites a lot of code changes due to Unstable API

c. Node.js Asynchronous Programming Model makes it difficult to maintain code

4. DotNet

i. Original author: Microsoft

ii. Developers: Microsoft, .NET Community

iii. Initial release: 2000

iv. Stable release: 6.0 (November 2021)

v. Preview release: 6.0.0-preview.5 (February 2023)

vi. Repository (with cloud support): https://github.com/dotnet/runtime, https://github.com/dotnet/sdk

vii. Written in (Languages): C#, F#, Visual Basic .NET

viii. Operating System support: Windows, macOS, Linux

ix. Platform, portability: Cross-platform

x. Available in (Total languages): Multiple

xi. List of languages supported: See https://dotnet.microsoft.com/languages

xii. Type (Programming tool, integrated development environment etc.): Development platform

xiii. Website: https://dotnet.microsoft.com/

xiv. Features: .NET runtime, .NET libraries, .NET Compiler, .NET Tools

xv. Size (in MB, GB etc.): Varies based on the installation type and components selected

xvi. Privacy and Security: Microsoft follows industry-standard security practices and implements

security features within .NET

xvii. Type of software (Open source/License): Open source

xviii. If License- Provide details: .NET is released under the MIT License

xix. Latest version: 6.0 (November 2021)

xx. Cloud support (Yes/No): Yes

xxi. Applicability: Developing and running modern applications on Windows, macOS, and Linux

xxii. Drawbacks (if any): May have a steeper learning curve for those unfamiliar with Microsoft

technologies, may have performance limitations compared to other development platforms.

5. Ruby on Rails

i. Original author: David Heinemeier Hansson

ii. Developers: Ruby on Rails Core Team, Ruby on Rails Community

iii. Initial release: July 2004

iv. Stable release: 6.1.4 (February 8, 2023)

v. Preview release: N/A

vi. Repository (with cloud support): https://github.com/rails/rails

vii. Written in (Languages): Ruby

viii. Operating System support: Cross-platform (OS X, Windows, Linux)

ix. Platform, portability: Web application framework, Portable

x. Available in (Total languages): 40+

xi. List of languages supported: See https://www.railslanguages.com/

xii. Type (Programming tool, integrated development environment etc.): Web application framework,

Model-View-Controller (MVC)

xiii. Website: https://rubyonrails.org/

xiv. Features: Model-View-Controller (MVC) architecture, convention over configuration, active record

pattern, action view templates, action mailer, active storage, action cable

xv. Size (in MB, GB etc.): Approximately 61 MB (source code)

xvi. Privacy and Security: Ruby on Rails has strong security features, but ultimately it depends on the

implementation of the developer

xvii. Type of software (Open source/License): Open source

xviii. If License- Provide details: Ruby on Rails is released under the MIT License

xix. Latest version: 6.1.4

xx. Cloud support (Yes/No): No native cloud support, but it can be deployed to various cloud platforms

xxi. Applicability: Developing web applications

xxii. Drawbacks (if any): Can have a steeper learning curve compared to other web application

frameworks, performance can be an issue for very large applications.

6. Anaconda

i. Original author: Continuum Analytics

ii. Developers: Anaconda, Inc.

iii. Initial release: 2012

iv. Stable release: Anaconda Navigator 1.13.1 (2022-10-07)

v. Preview release: N/A

vi. Repository (with cloud support ): Anaconda Repository (https://anaconda.org/), Anaconda Cloud

(https://anaconda.cloud/)

vii. Written in (Languages): Python, R

viii. Operating System support: Windows, macOS, Linux

ix. Platform, portability: Cross-platform

x. Available in (Total languages): N/A

xi. List of languages supported: Python, R

xii. Type (Programming tool, integrated development environment etc.): Distribution of Python and R

programming languages and tools for scientific computing and data science

xiii. Website: https://www.anaconda.com/

xiv. Features: Package management and deployment, Python and R language support, Jupyter

notebooks, IDE integration, Data visualization, Machine learning

xv. Size (in MB, GB etc.): Depends on the version and installation type, typically a few GBs.

xvi. Privacy and Security: Anaconda takes privacy and security seriously, following industry standards

and best practices.

xvii. Type of software (Open source/License): Proprietary license

xviii. If License- Provide details: Anaconda is licensed under the Anaconda Individual Edition license

agreement.

xix. Latest version: Anaconda Navigator 1.13.1 (2022-10-07)

xx. Cloud support (Yes/No): Yes

xxi. Applicability: Data science, scientific computing, machine learning, deep learning, data

visualization, data analysis, and more.

xxii. Drawbacks (if any): Some users may find the size and resource usage of the distribution to be a

concern. Additionally, proprietary licenses may not be suitable for all users and projects.

7. Google Colab

i. Original author: Google

ii. Developers: Google engineers

iii. Initial release: April 2014

iv. Stable release: October 2021

v. Preview release:

vi. Repository (with cloud support): The repository is called "googlecolab" and it contains the source

code and documentation for Google Colab, an interactive Jupyter-style environment for developing

and running machine learning code in the cloud. The repository is open source, and contributions from

the community are welcome.

vii. Written in (Languages): Google Colab is primarily written in Python, and uses the Jupyter Notebook

interface.

viii. Operating System support: Any device.

ix. Platform, portability: Google Colab is a cloud-based platform, which means that it runs on remote

servers and the user interacts with it through a web browser. This makes Colab highly portable and

accessible from anywhere with an internet connection. Additionally, the Jupyter Notebook interface of

Colab makes it easy to share and collaborate on code and projects, as notebooks can be shared and

edited by multiple users in real-time. This makes Colab a highly accessible and portable platform for

machine learning and data science.

x. Available in (Total languages): Google Colab supports a variety of programming languages,

including: Python, R, TensorFlow, PyTorch, Keras

xi. List of languages supported: Scala, Julia, MATLAB, Lua

xii. Type (Programming tool, integrated development environment etc.):

a. Google Colab is an online, cloud-based platform that provides an interactive Jupyter-style

environment for developing and running code. It can be classified as:

b. Interactive development environment (IDE) for machine learning and data science: Colab

provides a web-based interface for developing, running, and sharing code, along with many tools

and resources for data analysis and machine learning.

c. Jupyter Notebook platform: Colab is based on the Jupyter Notebook interface, which is a popular

platform for developing and sharing interactive documents that contain code, text, and other

multimedia elements.

d. Cloud-based platform: Colab runs on Google's cloud infrastructure, which means that users can

access their notebooks and run code from anywhere with an internet connection, without having

to worry about the underlying hardware or software.

xiii. Website: https://colab.research.google.com/

xiv. Features:

a. Jupyter Notebook interface: Colab provides an easy-to-use, interactive environment for writing

and running code, along with rich text and multimedia elements.

b. Cloud-based platform: Colab runs on Google's cloud infrastructure, which means that users can

access their notebooks from anywhere with an internet connection, without having to worry about

the underlying hardware or software.

c. Support for multiple programming languages: Colab supports a wide range of programming

languages, including Python, R, TensorFlow, PyTorch, and more.

d. Access to powerful hardware: Colab provides access to high-performance GPUs and TPUs, which

can be used for training large machine learning models and running complex computations.

e. Easy sharing and collaboration: Colab makes it easy to share notebooks and collaborate with

others on projects, as notebooks can be shared and edited by multiple users in real-time.

f. Integration with Google Drive: Colab notebooks can be saved directly to Google Drive, making it

easy to store and access projects from multiple devices.

g. Free and open source: Colab is a free, open-source platform, which makes it accessible to anyone

who wants to use it.

xv. Size (in MB, GB etc.): It is cloud based so size is not specified.

xvi. Privacy and Security

a. Google Colab uses the security infrastructure of Google Cloud, which includes robust access

controls, network security, and physical security to protect user data. However, as with any cloudbased service, users should be aware of the potential privacy and security risks associated with

storing and processing data in the cloud.

b. In terms of privacy, Google Colab is subject to Google's privacy policy, which may include the

collection and use of user data for various purposes, such as improving the service, providing

personalized content and advertisements, and complying with legal requirements.

xvii. Type of software (Open source/License): Open source

xviii. If License- Provide details.

xix. Latest version: Latest version of Google Colab is "Colab Pro".

xx. Cloud support (Yes/No): Yes

xxi. Applicability: Google Colab is suitable for:

a. Machine Learning and Deep Learning experimentation and development.

b. Data analysis and visualization.

c. Collaborative coding and sharing of notebooks.

d. Running Jupyter notebooks in the cloud with free GPU and TPU support.

e. Education and research in the field of AI and data science.

xxiii. Drawbacks (if any)

a. Limited computational resources and storage, compared to personal computers or dedicated servers.

b. Timeout for long running processes and idle notebooks.

c. Dependent on a stable internet connection.

d. Limited customization options and pre-installed packages.

e. Limited integration with Google Drive and other Google services.

8. Django

i. Original author: Adrian Holovaty and Simon Willison

ii. Developers: Django Software Foundation, Django community

iii. Initial release: July 2005

iv. Stable release: 3.2 (January 2022)

v. Preview release: N/A

vi. Repository (with cloud support): https://github.com/django/django

vii. Written in (Languages): Python

viii. Operating System support: Cross-platform

ix. Platform, portability: Web framework, cross-platform

x. Available in (Total languages): Multiple

xi. List of languages supported: English

xii. Type (Programming tool, integrated development environment etc.): Web framework

xiii. Website: https://www.djangoproject.com/

xiv. Features: URL routing, template engine, Object-Relational Mapping (ORM), administrative

interface, middleware support, caching, serialization, and more

xv. Size (in MB, GB etc.): Approximately 15 MB

xvi. Privacy and Security: Depends on the security measures implemented by the developer

xvii. Type of software (Open source/License): Open source

xviii. If License- Provide details: Django is released under the BSD 3-Clause "New" or "Revised" License

xix. Latest version: 3.2 (January 2022)

xx. Cloud support (Yes/No): Yes

xxi. Applicability: Developing web applications, especially complex ones

xxii. Drawbacks (if any): Steep learning curve, less flexibility compared to other web frameworks, can

lead to performance issues for large and complex projects.

9. Vue.js

i. Original author: Evan You

ii. Developers: Vue.js community, Evan You

iii. Initial release: February 2014

iv. Stable release: 3.7.0 (January 2022)

v. Preview release: N/A

vi. Repository (with cloud support): https://github.com/vuejs/vue

vii. Written in (Languages): JavaScript

viii. Operating System support: Cross-platform

ix. Platform, portability: JavaScript framework, cross-platform

x. Available in (Total languages): Multiple

xi. List of languages supported: English

xii. Type (Programming tool, integrated development environment etc.): JavaScript framework

xiii. Website: https://vuejs.org/

xiv. Features: Reactive data binding, template-based view components, Vue CLI, official templates, and

more

xv. Size (in MB, GB etc.): Approximately 30 KB (minified and gzipped)

xvi. Privacy and Security: Depends on the security measures implemented by the developer

xvii. Type of software (Open source/License): Open source

xviii. If License- Provide details: Vue.js is released under the MIT License

xix. Latest version: 3.7.0 (January 2022)

xx. Cloud support (Yes/No): Yes

xxi. Applicability: Developing user interfaces and single-page applications

xxii. Drawbacks (if any): Steep learning curve compared to other JavaScript frameworks, less developed

ecosystem compared to React and Angular.

10. GitHub

i. Original author: Tom Preston-Werner, Chris Wanstrath, and PJ Hyett

ii. Developers: GitHub Inc. and its community of contributors.

iii. Initial release: n/a (continuously updated)

iv. Stable release: n/a (continuously updated)

v. Preview release: February 2008

vi. Repository (with cloud support): Yes

vii. Written in (Languages): Ruby, Go, JavaScript, Erlang

viii. Operating System support: Web-based, available on Windows, MacOS, Linux

ix. Platform, portability: Web-based, accessible from any device with an internet connection

x. Available in (Total languages): Over 20

xi. List of languages supported: See https://github.com/github/linguist for a complete list

xii. Type (Programming tool, integrated development environment etc.): Version control repository, webbased Git management tool

xiii. Website: https://github.com/

xiv. Features: Code hosting and collaboration, issue tracking, project management, continuous integration

and deployment, wikis, gists, etc.

xv. Size (in MB, GB etc.): Varies by repository

xvi. Privacy and Security: Supports private and public repositories with configurable privacy settings,

offers security features like two-factor authentication and encryption at rest.

xvii. Type of software (Open source/License): Proprietary software with various open-source components,

some public repositories are open source.

xviii. If License- Provide details: GitHub's proprietary license can be found at

https://help.github.com/en/github/site-policy/github-terms-of-service. Some open-source projects

hosted on GitHub are subject to the respective open-source license.

xix. Latest version: n/a (continuously updated)

xx. Cloud support (Yes/No): Yes, GitHub offers cloud-based hosting services

xxi. Applicability: Software development teams, open-source projects, individual developers, etc.

xxii. Drawbacks (if any): Limited control over server configuration and infrastructure for some users, user

interface may not be intuitive for all users, costs for private repositories and advanced features.

11. React

i. Original author: Jordan Walke

ii. Developers: Facebook, React community

iii. Initial release: March 2013

iv. Stable release: 17.0.2 (February 2022)

v. Preview release: N/A

vi. Repository (with cloud support): https://github.com/facebook/react

vii. Written in (Languages): JavaScript

viii. Operating System support: Cross-platform

ix. Platform, portability: JavaScript library, cross-platform

x. Available in (Total languages): Multiple

xi. List of languages supported: English

xii. Type (Programming tool, integrated development environment etc.): JavaScript library

xiii. Website: https://reactjs.org/

xiv. Features: Virtual DOM, reactive data binding, server-side rendering, JSX, hooks, and more.

xv. Size (in MB, GB etc.): Approximately 100 KB (minified and gzipped)

xvi. Privacy and Security: Depends on the security measures implemented by the developer

xvii. Type of software (Open source/License): Open source

xviii. If License- Provide details: React is released under the MIT License

xix. Latest version: 17.0.2 (February 2022)

xx. Cloud support (Yes/No): Yes

xxi. Applicability: Developing user interfaces and single-page applications

xxii. Drawbacks (if any): Steep learning curve for beginners, limited documentation for complex

scenarios, large size compared to other JavaScript libraries.

Implement linear regression problem using Google Colab (Perform pre-processing, training and testing),

Anaconda, Eclipse.

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

We use scikit-learn to perform linear regression on the dataset.

i. Load the data: Load the bike sharing dataset into a pandas data-frame and inspect the data to

understand the features and target variable.

ii. Pre-processing: Perform any necessary data pre-processing steps such as handling missing values,

encoding categorical variables, and scaling numeric features.

iii. Feature Selection: Select the features that will be used for training the linear regression model. You

may use statistical methods or domain knowledge to choose the most relevant features.

iv. Split the data: Split the data into training and testing sets so that you can evaluate the performance

of the model on unseen data.

v. Train the model: Train a linear regression model using the training data.

vi. Evaluate the model: Evaluate the performance of the model using appropriate metrics such as mean

squared error, mean absolute error, R-squared, etc.

vii. Make predictions: Use the final model to make predictions on new, unseen data.

Code:

import pandas as pd

import numpy as np

import matplotlib.pyplot as plt

bike=pd.read\_csv('day.csv')

bike

bike.info()

bike.head()

y=bike['cnt']

X=bike[['season','mnth','holiday','weekday','workingday','weathersit','temp','atemp','

hum','windspeed']]

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=101)

from sklearn.linear\_model import LinearRegression

lm=LinearRegression()

lm.fit(X\_train,y\_train)

cdf = pd.DataFrame(lm.coef\_,X.columns,columns=['Coefficient'])

cdf

predictions = lm.predict(X\_test)

plt.scatter(predictions,y\_test)

plt.xlabel('Test')

plt.ylabel('Predicted Y')

from sklearn import metrics

print('MAE:', metrics.mean\_absolute\_error(y\_test, predictions))

print('MSE:', metrics.mean\_squared\_error(y\_test, predictions))

print('RMSE:', np.sqrt(metrics.mean\_squared\_error(y\_test, predictions)))

