**Software Engineering Tools Lab**

**Assignment No-2**

**(Module 2- Software Development Frameworks)**

**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) |

1. **Eclipse -**

Eclipse is an integrated development Environment(IDE), it’s the second most popular IDE for Java Development

1. Original Author - created by IBM in Nov 2001

2. Developers - Eclipse Foundation

3. Initial release(1.0) – 29 Nov 2001

4. Stable release(4.26.0) – 7 Dec 2022

5. Preview release(4.27) – 2023-03 release

6. Repository (with cloud support ) - [git.eclipse.org/c/](https://git.eclipse.org/c/)

7. Written in (Languages) – Java and C

8. Operating System support – Windows, Linux, macOS

9. Platform ,portability – Java SE, Standard Widget Toolkit

10. Available in (Total languages) - 44

11. List of languages supported - Albanian, Arabic, Basque, Bulgarian, Catalan, Chinese (simplified, traditional), Czech, Danish, Dutch, English (Australia, Canada), Estonian, Finnish, French, German, Greek, Hebrew, Hindi, Hungarian, Indonesian, Italian, Japanese, Klingon, Korean, Kurdish, Lithuanian, Malayalam, Mongolian, Myanmar, Nepali, Norwegian, Persian, Polish, Portuguese (Portugal, Brazil), Romanian, Russian, Serbian, Slovak, Slovenian, Spanish, Swedish, Thai, Turkish, Ukrainian, Vietnamese

12. Type (Programming tool, integrated development environment etc.) - Programming tool, Integrated Development Environment .

13. Website - [www.eclipse.org/eclipseide/](https://www.eclipse.org/eclipseide/)

14. Features –

* Almost everything is a plug-in, which can be used to expand the functionality of IDE.
* Provides a visual code debugging tool
* Has great UI with drag and drop
* Supports multi-source knowledge tools such as grading, folding and hyperlinks navigation, macro definition, and code editing with syntax highlighting.
* Supports private code repository

15. Size (in MB, GB etc.) – 302 MB

16. Privacy and Security – Running an untrusted Eclipse plug-in is approximately as safe as running an untrusted Java program.

17. Type of software (Open source/License) – Free and Open Source

18. License- Eclipse Public License

19. Latest version - (4.26.0), 7 Dec 2022

20. Cloud support (Yes/No) - Yes

21. Applicability – It’s a very popular IDE, widely used for developing Java application, may also be used to develop applications in other languages like C, C++, C#, COBOL, D, Ruby, Python etc.

22. Drawbacks (if any) - Slower than its alternative- NetBeans. Various plugins require different versions of same plugin for different reason thus complicating stuff and turning into a plug-in nightmare.

1. **Android SDK -**

Android SDK is a software development kit that includes a set of development tools for developing android apps. These include a debugger, libraries, a handset emulator based on QEMU, documentation, sample code, and tutorials.

1. Original Author - Google

2. Developers – Google

3. Initial release(1.0) – Oct 2009

4. Stable release(26.1.1) – Sept 2017

6. Repository (with cloud support ) - <https://android.googlesource.com/platform/tools/base/+/master/sdklib/src/main/java/com/android/sdklib/repository/sdk-repository-10.xsd>

7. Written in (Languages) – Java

8. Operating System support – Cross Platform

9. Platform ,portability – Android Platform

10. Available in (Total languages) - 1

11. List of languages supported - English

12. Type (Programming tool, integrated development environment etc.) - IDE, SDK

13. Website - [developer.android.com/sdk/index.html](https://developer.android.com/sdk/index.html)

14. Features –

* Offline Mapping – SDK helps in dynamically downloading maps for more than 190 countries, which u can view offline.
* Improvised API compatibility
* An updated android SDK is released with each Android update release.

15. Size (in MB, GB etc.) – 5 GB

16. Privacy and Security – Some security issues were found in 2014

17. Type of software (Open source/License) – Free and Open Source

18. License- Android SDK License

19. Latest version - (34.0.0) Feb 2023

20. Cloud support (Yes/No) - Yes

21. Applicability – Its widely used to develop Android applications.

22. Drawbacks (if any) - Only choice for android app development and sometimes has security issues

1. **Node.JS -**

Node.js is a cross platform, open source server environment. It lets developer use JavaScript to write command line tools and for server-side scripting.

1. Original Author - Ryan Dahl

2. Developers – OpenJS Foundation

3. Initial release(1.0) – May 27, 2009

4. Stable release (19.6.0) - February 2, 2023

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

7. Written in (Languages) – C, C++, JavaScript

8. Operating System support – Cross Platform

12. Type (Programming tool, integrated development environment etc.) – Runtime Environment

13. Website - [nodejs.org](https://nodejs.org/)

14. Features –

* **Asynchronous and Event Driven** − All APIs of Node.js library are asynchronous, that is, non-blocking. It essentially means a Node.js based server never waits for an API to return data. The server moves to the next API after calling it and a notification mechanism of Events of Node.js helps the server to get a response from the previous API call.
* **Very Fast** − Being built on Google Chrome's V8 JavaScript Engine, Node.js library is very fast in code execution.
* **Single Threaded but Highly Scalable** − Node.js uses a single threaded model with event looping. Event mechanism helps the server to respond in a non-blocking way and makes the server highly scalable as opposed to traditional servers whichcreate limited threads to handle requests. Node.js uses a single threaded program and the same program can provide service to a much larger number of requests than traditional servers like Apache HTTP Server.
* **No Buffering** − Node.js applications never buffer any data. These applications simply output the data in chunks.

15. Size (in MB, GB etc.) – 512 MB

16. Privacy and Security – Node.js platform is inherently secure, but because it uses 3rd party open source packages through its npm(package management system, its vulnerable to cyber attacks. Users must implement best security practices to maintain security of Node.js.

17. Type of software (Open source/License) – Free and Open Source

18. License- MIT License

19. Latest version - (19.x) Oct 2022

20. Cloud support (Yes/No) - Yes

21. Applicability –

* I/O bound Applications
* Data Streaming Applications
* Data Intensive Real-time Applications (DIRT)
* JSON APIs based Applications
* Single Page Applications

22. Drawbacks (if any) –

* It is not advisable to use Node.js for CPU intensive applications. Its performance is reduced with heavy computational tasks
* It lacks library support.
* It has tons of nested callbacks.
* It has an unstable API.

1. **.NET -**

.NET (pronounced as "dot net"; previously named .NET Core) is a free and open-source, managed computer software framework.

1. Developers - .NET Foundation and open-source community

3. Initial release(1.0) – 27 June 2016

4. Stable release (7.0.3) - 14 February 2023

5. Preview release(.NET 8) – 2023-11 release

6. Repository (with cloud support ) - [github.com/dotnet/core](https://github.com/dotnet/core)

7. Written in (Languages) – C++ and C#

8. Operating System support – Cross Platform

9. Platform ,portability – IA-32, x86-64, s390x and ARM,

12. Type (Programming tool, integrated development environment etc.) – Software Framework

13. Website - [dotnet.microsoft.com](https://dotnet.microsoft.com/)

14. Features –

* OOPS Support. It uses object-oriented technology with reusable components thus taking less time to design the app.
* Easy development of web application. Dot net is used for developing various applications and deployed in Linux, Windows and MacOS. It also offers advanced UI elements and helps to write a lot of coding.
* Supports multi-languages. At present, there are four languages in Dot net, they are C#, J Script NET, Visual Basic.Net, and Managed C++.
* Automatic memory management. It handles its memory on its own and the unused objects are gathered by the garbage collector for freeing up memory space.
* Security.
* Action Filters. They are used for authorization process and error handling in Dot Net.
* Self Hosted Web Applications.

15. Size (in MB, GB etc.) – 50 MB

16. Privacy and Security – Dot Net Platforms are secure and safe for organization applications. Some of the additional features are the type of safety, security, code access, and role-based authentication. These make Dot Net applications more robust and safe.

17. Type of software (Open source/License) – Free and Open Source

18. License- MIT License

19. Latest version - (7.0.3) - 14 February 2023

20. Cloud support (Yes/No) - Yes

21. Applicability – It is used for building desktop, web, and mobile applications that can run natively on any operating system. The . NET system includes tools, libraries, and languages that support modern, scalable, and high-performance software development.

22. Drawbacks (if any) -

* Although .NET is an open-source technology, it can still be expensive to use. The Visual Studio IDE component, as well as additional quality assurance services and collaboration tools, can quickly add costs to projects.

1. **Ruby on Rails -**

Ruby on Rails (simplified as Rails) is a server-side web application framework. It supports MVC (Model View Controller) architecture providing default structure for a database, web service and web pages. It encourages and facilitates the use of web standards such as JSON or XML for data transfer and HTML, CSS and JavaScript for user interfacing.

1. Original Author - [David Heinemeier Hansson](https://en.wikipedia.org/wiki/David_Heinemeier_Hansson)

3. Initial release(1.0) – Aug 2004.

4. Stable release (7.0.4.2) - 24 January 2023.

6. Repository (with cloud support ) - [github.com/rails/rails](https://github.com/rails/rails)

7. Written in (Languages) – Ruby

8. Operating System support – Windows, Linux, macOS

12. Type (Programming tool, integrated development environment etc.) Web Application Framework

13. Website - [rubyonrails.org](https://rubyonrails.org/)

14. Features –

* Active Records: The active record framework is introduced in Ruby on Rails. It is a powerful library that allows the developer to design the database interactive queries.
* Built-in Testing: Ruby on Rails provides its own set of tests that will run on your code. It will save time and effort.
* Programming Language: This syntax of Ruby on Rails is simple because the syntax of the Ruby programming language is close to English, so it is always easier to structure your thinking and writing it into code.
* It uses Metaprogramming techniques to write programs.

15. Size (in MB, GB etc.) – 57.8 MB

16. Privacy and Security –

* XSS is the most common security breach for Ruby on Rails projects. An XSS vulnerability can undermine a web application, introducing malicious code that affects end users. XSS attacks can take advantage of comments, reviews, search result pages, and other interactive features to deliver malicious content to your users.
* Ruby on Rails contains helper methods to help protect against these attacks, and standard best practices can provide further protection.

17. Type of software (Open source/License) – Free and Open Source

18. License- MIT License

19. Latest version - (4.26.0), 7 Dec 2022

20. Cloud support (Yes/No) - Yes

21. Applicability It is designed to make programming web applications easier by making assumptions about what every developer needs to get started. It allows you to write less code while accomplishing more than many other languages and frameworks.

22. Drawbacks (if any) –

* Shortage of flexibility.
* Continuous evolvement.
* Performance time.
* Price of a mistake.

1. **Anaconda –**
2. Original author: Continuum Analytics.
3. Developers: Anaconda is developed and maintained by Anaconda, Inc.
4. Initial release: The initial version of Anaconda was released in 2012.
5. Stable release: The current stable version of Anaconda is 2021.11.
6. Preview release: Anaconda provides early access to some new features and updates as part of its beta program.
7. Repository (with cloud support): Anaconda has a cloud-based repository called Anaconda Cloud, which allows users to share and distribute packages and environments.
8. Written in (Languages): Anaconda is written in Python, with some components written in C++ and other languages.
9. Operating System support: Anaconda is supported on Windows, macOS, and Linux operating systems.
10. Platform, portability: Anaconda is portable across different platforms, allowing users to create and share environments across different operating systems.
11. Available in (Total languages): Anaconda's interface is available in English.
12. List of languages supported: Only English is supported.
13. Type (Programming tool, integrated development environment etc.): Anaconda is a package manager, environment manager, and distribution of the Python and R programming languages.
14. Website: <https://www.anaconda.com/>
15. Features: Some features of Anaconda include:

* Easy installation and management of packages and environments for Python and R
* Integration with popular data science tools such as Jupyter Notebook and Spyder
* Access to over 7,500 pre-built packages for data science and machine learning
* Ability to create and share custom environments with specific packages and dependencies
* Cloud-based repository for sharing and distributing packages and environments
* Integration with popular cloud platforms such as Amazon Web Services and Microsoft Azure
* Comprehensive documentation and community support

1. Size (in MB, GB etc.): The size of the Anaconda distribution varies depending on the version and platform, but it is typically several hundred megabytes.
2. Privacy and Security: Anaconda is developed and maintained by a reputable company with a strong commitment to privacy and security. However, users should be mindful of any data they store or share via the platform.
3. Type of software (Open source/License): Anaconda is an open source software released under the BSD license.
4. If License- Provide details: The BSD license is a permissive free software license that allows users to use, modify, and redistribute the software with few restrictions.
5. Latest version: The latest stable version of Anaconda is 2021.11.
6. Cloud support (Yes/No): Yes, Anaconda has a cloud-based repository called Anaconda Cloud.
7. Applicability: Anaconda is commonly used by data scientists, machine learning practitioners, and scientific researchers for managing packages, environments, and data.
8. Drawbacks (if any): Some potential drawbacks of Anaconda include its large size and potential conflicts between packages and dependencies when managing environments.
9. **Google COLab -**
10. Original author: Google.
11. Developers: Google.
12. Initial release: Google Colab was launched in October 2017.
13. Stable release: There is no specific "stable" release for Google Colab, as it is a web-based service that is continually updated.
14. Preview release: Google Colab provides early access to some new features and updates as part of its beta program.
15. Repository (with cloud support): Google Colab is a cloud-based service that does not have a repository in the traditional sense.
16. Written in (Languages): Google Colab's backend is written in Python.
17. Operating System support: Google Colab is a web-based service that can be accessed from any operating system with a web browser.
18. Platform, portability: Google Colab is a cloud-based service that can be accessed from any platform that supports a web browser.
19. Available in (Total languages): Google Colab's interface is available in English.
20. List of languages supported: Only English is supported.
21. Type (Programming tool, integrated development environment etc.): Google Colab is an online platform for coding, testing, and sharing machine learning models.
22. Website: <https://colab.research.google.com/>
23. Features: Some features of Google Colab include:

* Free access to a cloud-based computing environment with a GPU (graphics processing unit) for running machine learning models
* Integration with Google Drive for easy data storage and sharing
* Collaboration features for working on projects with others in real-time
* Support for various programming languages, including Python, R, and Julia
* Built-in libraries and tools for machine learning, such as TensorFlow, Keras, and PyTorch
* Ability to run code snippets in a "sandbox" environment for testing and debugging
* Easy sharing of code and notebooks with others via URL links

1. Size (in MB, GB etc.): Google Colab is a cloud-based service, so there is no specific size limit for using it.
2. Privacy and Security: Google Colab is developed and maintained by Google, which has a strong track record for privacy and security. However, users should be mindful of any data they store or share via the platform.
3. Type of software (Open source/License): Google Colab is a proprietary software developed by Google.
4. If License- Provide details: Google Colab's terms of service are available on its website.
5. Latest version: Google Colab is continually updated with new features and improvements.
6. Cloud support (Yes/No): Google Colab is a cloud-based service.
7. Applicability: Google Colab is commonly used by researchers, data scientists, and machine learning practitioners for testing and sharing models.
8. Drawbacks (if any): Some potential drawbacks of Google Colab include limited computing resources compared to dedicated hardware, reliance on an internet connection for usage, and potential privacy concerns with using a cloud-based service.
9. **Django -**
10. Original author: Django was originally developed by a web team at the Lawrence Journal-World newspaper, led by Adrian Holovaty and Simon Willison.
11. Developers: Django is developed by a community of contributors led by the Django Software Foundation.
12. Initial release: 21st July 2005.
13. Stable release: 3.2.12 (as of 22nd February 2022).
14. Preview release: Django 4.0 alpha 1 (as of 22nd February 2022).
15. Repository (with cloud support): Django's code is hosted on GitHub, which provides cloud support.
16. Written in (Languages): Django is written in Python.
17. Operating System support: Django is supported on a variety of operating systems, including Windows, macOS, and Linux.
18. Platform, portability: Django is a platform-independent framework that can be used on any platform that supports Python.
19. Available in (Total languages): Django's documentation is available in 8 languages.
20. List of languages supported: English, French, German, Japanese, Korean, Portuguese, Russian, and Spanish.
21. Type (Programming tool, integrated development environment etc.): Django is a web framework.
22. Website: <https://www.djangoproject.com/>
23. Features: Django provides a number of features for building web applications, including:

* Object-relational mapping (ORM) for database access
* Automatic admin interface for managing database content
* Templating system for generating HTML
* Form handling and validation
* URL routing
* Security features such as cross-site scripting (XSS) and cross-site request forgery (CSRF) protection
* Internationalization and localization support
* Built-in caching framework
* Scalability through support for multiple servers and database sharding

1. Size (in MB, GB etc.): The size of Django depends on the specific installation and project requirements.
2. Privacy and Security: Django provides built-in security features such as XSS and CSRF protection, and has a strong security track record. Privacy considerations will depend on the specific application built with Django.
3. Type of software (Open source/License): Django is open-source software.
4. If License- Provide details: Django is released under the BSD (Berkeley Software Distribution) license.
5. Latest version: Django 4.0 alpha 1 (as of 22nd February 2022).
6. Cloud support (Yes/No): Django can be used with cloud services such as AWS and Google Cloud.
7. Applicability: Django is widely used for building web applications and has a large community of users and contributors.
8. Drawbacks (if any): Some potential drawbacks of Django include a relatively steep learning curve for beginners, and a potential for slower performance compared to lower-level web frameworks.
9. **Vue.JS –**

Original author: Evan You

Developers: Evan You and a community of individual developers and companies

Initial release: February 2014

Stable release: 3.2.31 (February 22, 2022)

Preview release: None

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

Written in: JavaScript

Operating System support: Windows, macOS, Linux

Platform portability: Web (client-side)

Available in: 15 languages

List of languages supported: Arabic, Chinese (Simplified), Chinese (Traditional), Dutch, English, French, German, Indonesian, Italian, Japanese, Korean, Portuguese, Russian, Spanish, Turkish

Type: JavaScript framework

Website: https://vuejs.org/

Features: Reactive and composable view components, two-way data binding, virtual DOM, server-side rendering, Vuex state management, Vue Router, transition system, asynchronous components, scoped styles

Size: 84 KB (minified and gzipped)

Privacy and Security: Vue.js does not collect any personal information and has no known security vulnerabilities. However, like any software, it is possible to introduce security vulnerabilities if not used properly.

Type of software: Open source

License details: MIT License

Latest version: 3.2.31

Cloud support: Yes, through services like AWS Amplify, Google Cloud Platform, and Microsoft Azure.

Applicability: Vue.js is widely used for building user interfaces for web applications, including single-page applications and progressive web applications.

Drawbacks: Vue.js may not be as popular as other front-end frameworks, such as React or Angular, which can make it more difficult to find resources and support. Additionally, some developers may find the learning curve for Vue.js steeper than other frameworks.

1. **Github –**

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

Developers: GitHub, Inc.

Initial release: April 10, 2008

Stable release: Latest version is continuously updated and maintained

Preview release: None

Repository (with cloud support): GitHub.com

Written in (Languages): Ruby, JavaScript, CSS, and HTML

Operating System support: Windows, macOS, and Linux

Platform, portability: Web-based, platform independent

Available in (Total languages): N/A

List of languages supported: N/A

Type (Programming tool, integrated development environment etc.): Web-based Git repository hosting service

Website: https://github.com/

Features: Git version control, issue tracking, code review, collaboration tools, continuous integration, community management, and more.

Size (in MB, GB etc.): N/A

Privacy and Security: Offers a range of security and privacy features, including two-factor authentication, SSH key management, and encrypted communication.

Type of software (Open source/License): Proprietary, commercial software

If License- Provide details: GitHub Enterprise License Agreement

Latest version: Continuously updated and maintained

Cloud support (Yes/No): Yes

Applicability: Used by developers and organizations to host, review, and collaborate on code

Drawbacks (if any): Some users have raised concerns over the company's acquisition by Microsoft and its potential impact on privacy and security.

1. **React -**

Original author: Facebook, Inc.

Developers: Facebook and a community of individual developers and companies

Initial release: May 29, 2013

Stable release: 18.3.3 (February 16, 2023)

Preview release: None

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

Written in: JavaScript

Operating System support: Windows, macOS, Linux

Platform portability: Web (client-side)

Available in: 42 languages

List of languages supported: Arabic, Bengali, Bulgarian, Catalan, Chinese (Simplified), Chinese (Traditional), Croatian, Czech, Danish, Dutch, English, Estonian, Finnish, French, German, Greek, Hebrew, Hindi, Hungarian, Indonesian, Italian, Japanese, Korean, Latvian, Lithuanian, Malay, Norwegian, Persian, Polish, Portuguese (Brazilian), Portuguese (Portugal), Romanian, Russian, Serbian, Slovak, Slovenian, Spanish, Swedish, Thai, Turkish, Ukrainian, Vietnamese

Type: JavaScript library

Website: https://reactjs.org/

Features: Component-based architecture, virtual DOM, JSX syntax, one-way data flow, server-side rendering, Hooks API, Context API, performance optimizations

Size: 149 KB (minified and gzipped)

Privacy and Security: React does not collect any personal information and has no known security vulnerabilities. However, like any software, it is possible to introduce security vulnerabilities if not used properly.

Type of software: Open source

License details: MIT License

Latest version: 18.3.3

Cloud support: Yes, through services like AWS Amplify, Google Cloud Platform, and Microsoft Azure.

Applicability: React is widely used for building user interfaces for web applications, including single-page applications, mobile applications, and desktop applications using Electron.

Drawbacks: Some developers find the JSX syntax difficult to learn, and the learning curve can be steep for those new to React or JavaScript. Additionally, the virtual DOM can lead to performance issues if not used properly.

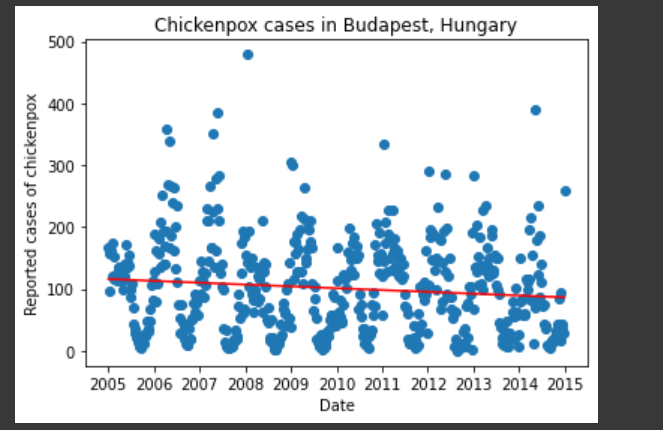
**2. Implement linear regression problem using Google colab (Perform preprocessing, training and testing) Node.Js , Android SDK , Dot Net, Ruby on Rails, Anaconda, Eclipse Use any of one following appropriate dataset.**

I used Dataset 6- <https://archive.ics.uci.edu/ml/datasets/Hungarian+Chickenpox+Cases>

**My Notebook -**

https://colab.research.google.com/drive/1cPNg7zLrwGyIyigiFX6KaWFXigWDfKoB?usp=sharing

**Results –**



Dataset 1 -https://www.kaggle.com/spittman1248/cdc-data-nutrition-physical-activityobesity

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