Software Engineering Tools Lab

Assignment No-2

(Module 2- Software Development Frameworks)

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Q. 1. For DotNet answer the following questions.

DOTNET FRAMEWORK

1. **Original author -** The . NET Framework (pronounced as "dot net") is a proprietary software framework developed by Microsoft that runs primarily on Microsoft Windows.

2. **Developers -** Microsoft

3. **Initial release-** February 14, 2002; 19 years ago

4. **Stable release -** .NET 6.0

5. **Preview release-** .NET 5.0

6. **Repository (with cloud support) -** https://github.com/microsoft/dotnet

7. **Written in (Languages)-** C++/CLR compiles the program written in different languages and Command Language Runtime(CLR) is written mostly in C++ and assembly language.

8. Operating System support- Windows 98 or later, Windows NT 4.0 or later, using DotNet Core we can use it on different OS

9. Platform ,portability - Visual Studio

10. Available in (Total languages) - 60+

11. List of languages supported - 60+ languages are supported by DotNet, in which 11 programming languages are designed and developed by Microsoft.

12. Type (Programming tool, integrated development environment etc.) - Visual studio can be used to develop dotNet applications.

13. Website - https://dotnet.microsoft.com/en-us/download/dotnet-framework

14. Features-

1. Common Executive Environment:-All .NET applications run under a common execution environment, called the Common Language Runtime. The CLR facilitates the interoperability between different .NET languages such as C#, Visual Basic, Visual C++, etc
2. Common Type System:-The .NET framework follows types of systems to maintain data integrity across the code written in different .NET compliant programming languages.
3. Multi-language support:-.NET provides multi-language support by managing the compilers that are used to convert the source to intermediate language (IL) and from IL to native code, and it enforces program safety and security.
4. Tool Support:-The CLR works hand-in-hand with tools like visual studio, compilers, debuggers, and profilers to make the developer's job much simpler.
5. Security:-The CLR manages system security through user and code identity coupled with permission checks. The identity of the code can be known and permission for the use of resources granted accordingly.
6. Automatic Resource Management:-The .NET CLR provides efficient and automatic resource management such as memory, screen space, network connections, database, etc.
7. Easy and rich debugging support:-The .NET IDE (integrated development environment) provides an easy and rich debugging support.
8. Simplified development:-With .NET installing or uninstalling, a window-based application is a matter of copying or deleting files. This is possible because .NET components are not referenced in the registry.
9. Framework class library:-The framework class library (FCL) of the .NET framework contains a rich collection of classes that are available for developers to

use these classes in code Microsoft has developed these classes to fulfill various tasks of applications, such as working with files and other data storages, performing input-output operations, web services, data access, and drawing graphics.

10. Portability:-The application developed in the .NET environment is portable. When the source code of a program written in a CLR compliant language complies, it generates a machine-independent and intermediate code.

15. Size (in MB, GB etc.)- 59 MB

16. Type of software (Open source/License) - License / proprietary software

17. If License- Provide details.: A license class is present in dotNet library

18. Latest version - 4.8.0 Build 4115 / May 1, 2021

19. Cloud support (Yes/No)- Yes, . NET enables you to build fast, modern, and scalable **cloud** applications on all major cloud platforms.

20. Applicability- .NET Framework can be used to develop the following types of apps and services:

• Console apps. See Building Console Applications.

• Windows GUI apps (Windows Forms). See Windows Forms.

• Windows Presentation Foundation (WPF) apps. See Windows Presentation Foundation.

• ASP.NET apps. See Web Applications with ASP.NET.

• Windows services. See Introduction to Windows Service Applications.

• Service-oriented apps using Windows Communication Foundation (WCF). See Service-Oriented Applications with WCF.

• Workflow-enabled apps using Windows Workflow Foundation (WF). See Windows Workflow Foundation.

21. Drawbacks (if any) -

- Limited Object-Relational Support
- Vendor Lock-in
- Memory Leaks

2.Implement linear regression problem using Google colab (Perform preprocessing, training and testing).

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

Link for google collab-
https://colab.research.google.com/drive/1mqdEIycTquiRRLyKsmM-lprGWxZnPsZ9?usp=sharing

Code -

```
import matplotlib.pyplot as plt

import numpy as np

from sklearn import linear_model

import pandas as pd

from sklearn.metrics import mean_squared_error, r2_score

from sklearn.model_selection import train_test_split

from google.colab import files

uploaded = files.upload()

df = pd.read_csv('AirQualityUCI.csv')

df.head()

x=df.iloc[:,2].values

y=df.iloc[:,3].values



x_train, x_test, y_train, y_test = train_test_split(x, y, test_size = 1/3,
random_state = 0)



x_test=x_test.reshape(-1,1)

x_train=x_train.reshape(-1,1)
```

```
lin_reg=linear_model.LinearRegression()


lin_reg.fit(x_train,y_train)


lin_reg_pred=lin_reg.predict(x_test)


print("Coefficients:\n",lin_reg.coef_)
print("Intercept:\n",lin_reg.intercept_)


print("Mean squared error: %.2f"
      % mean_squared_error(y_test, lin_reg_pred))


# Explained variance score: 1 is perfect prediction
print('Variance score: %.2f' % r2_score(y_test, lin_reg_pred))


plt.scatter(x_test, y_test, color = 'red')
plt.plot(x_test, lin_reg_pred, color = 'blue')
plt.title('Temperature vs  Humidity(Test set)')
plt.xlabel('Temperature')
plt.ylabel('Relative Humidity')
plt.show()
```

Result:

```
Coefficients:
 [-4.02872657]
Intercept:
 194.5221290669885
Mean squared error: 4.62
Variance score: 0.87
```