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DEPARTMENT: COMPUTER SCIENCE (200 Level)

COURSE: OBJECT ORIENTED PROGRAMMING (CSC 235)

Assignment

1. Explain the stages of running a C# program and describe vividly all the components of .NET framework in your language.
2. Briefly explain the similarities and differences between Java and C#
3. Explain in a concise way the process of installing Visual Studio Community version with a screen shot of the environment on your computer showing your matric number and names.
4. What is the meaning of Write Once Run Anywhere (WORA)?

Solutions

Question 1

Running a program in C#

If we have a project opened in Visual Studio, it can be run by pressing Ctrl+F5 (Start without debugging) or F5 (Start with debugging), or press the green arrow (Start Button) on the main Visual Studio toolbar.

If you already have the code for your program in a project in Visual Studio, open the project. To open the project, double-click or tap on the *.csproj* from the Windows File Explorer, or from Visual Studio, choose Open a project, browse to find the project (*.csproj*) file, and choose the project file. After the projects loads in Visual Studio, press Ctrl+F5 (Start without debugging) or use the green Start button on the Visual Studio toolbar to run the program.

The components of .NET framework

1. **Common Language Runtime (CLR)**: .Net Framework provides runtime environment called Common Language Runtime (CLR). It provides an environment to run all the .Net Programs. The code which runs under the CLR is called as Managed Code. Programmers need not to worry on managing the memory if the programs are running under the CLR as it provides memory management and thread management.
2. **.Net Framework Class Library (FCL)**: This is also called as Base Class Library and it is common for all types of applications i.e. the way you access the Library Classes and Methods in VB.NET will be the same in C#, and it is common for all other languages in .NET.
3. **Common Type System (CTS)**: It describes set of data types that can be used in different .Net languages in common. (i.e), CTS ensures that objects written in different .Net languages can interact with each other.
4. **Common Language Specification (CLS)**: It is a sub set of CTS and it specifies a set of rules that needs to be adhered or satisfied by all language compilers targeting CLR. It helps in cross language inheritance and cross language debugging.

Question 2

Similarities between Java and C#

1. Both Java and C# are object oriented programming language.
2. Both C# and Java compilers generate an intermediate language code after compilation.
3. Both languages include advanced features, like garbage collection, which remove some of the low level maintenance tasks from the programmer.
4. Java and C# have very similar syntax.

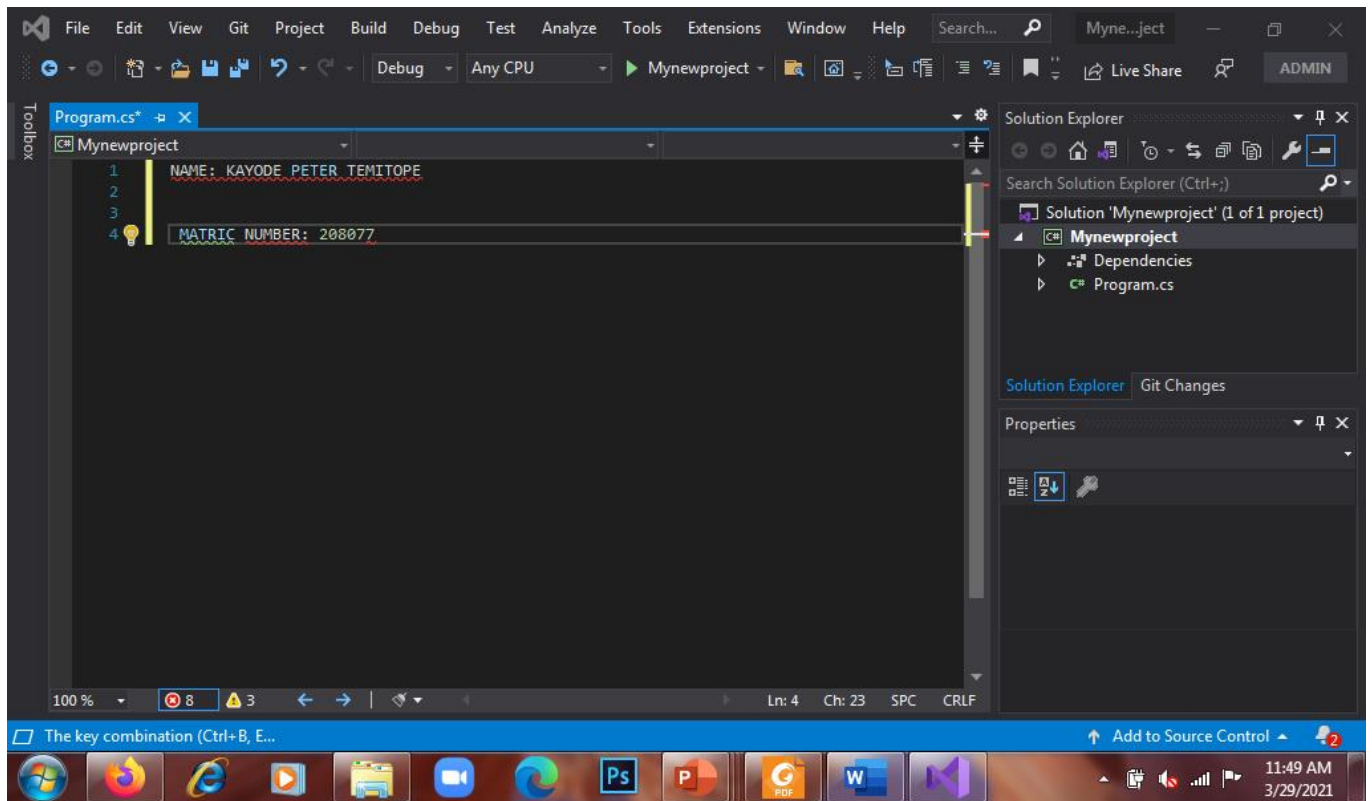
Differences between Java and C#

1. Java is a high level, robust, secured and object-oriented programming language developed by Oracle **WHILE** C# is an object-oriented programming language developed by Microsoft that runs on .Net Framework
2. Java programming language is designed to be run on a Java platform, by the help of Java Runtime Environment (JRE) **WHILE** C# programming language is designed to be run on the Common Language Runtime (CLR).
3. In java, built-in data types that are passed by value are called primitive types **WHILE** in C#, built-in data types that are passed by value are called simple types.
4. Java does not support conditional compilation **WHILE** C# supports conditional compilation using preprocessor directives.
5. Arrays in Java are direct specialization of Object **WHILE** arrays in C# are specialization of System.

Question 3

Processes involved in installing Virtual Studio Community version

1. Ensure that the PC has met the requirements for the package (availability of substantial memory space)
2. Download the Virtual Studio Community version
3. Install the Virtual Studio Installer
4. Choose the workload you want. That is, select the features you want to install alongside
5. Choose individual component which is optional
6. Install language pack which also optional
7. Select your installation location
8. Start developing



Question 4

Meaning of Write Once Run Anywhere (WORA)

WORA is a slogan created by Sun Microsystems which refers to the ability of a Program (mostly Java) to run on all common operating system or platforms. Ideally, this means Java can be developed on any device, compiled into a standard bytecode and be expected to run on any device equipped with a Java Virtual Machine (JVM). The installation of a JVM or Java interpreter on chips, devices or software packages has become an industry standard practice.

This means a programmer can develop code on a PC and can expect it to run on Java enabled cell phones, as well as on routers and mainframes equipped with Java, without any adjustments. This is intended to save software developers the effort of writing a different version of their software for each platforms or operating systems they intend to deploy on.