SE-Assignment-4

Question 1

GitHub is an online platform that offers hosting for version control of software development using Git.

The features are the following:

It helps with a better project management, it helps with collaboration takes place for developers or managers to organize, access, track or even keeping posted on their work. Milestones which helps tracking for your goals can help and project boards that help see tasks and projects in a visual way and is structured into columns.

Another feature can be linked to security and have safe packages. When using Depenabot you are have to get scanned addictions for any malicious exposures and gives notification for future updates. When you want your codebase to be save and have no issues this can be done by code scanning which will find possible security concerns.

Team work and collaboration can be done by having pull requests which people can review a code, make changes and join it into the main branch if permitted. Another way is code review which enables peer review of code over commentaries in comments, approval contrivances and recommendations.

Another feature is documentation, which if you want a platform for more wide-ranging documentation within a project or have direction and tutorials, you can use wikis. Also if you want a fast outline and instructions for the project you can use README Files.

Having CI and CD which are Continuous Integration and Continuous Deployment, you are able to set up CI/CD pipelines to make sure that you have code quality and enable constant delivery. Also you can program workflows, containing deploying a code, testing and building, which can be done via GitHub Actions.

GitHub supports in helping others to operate on local copies within a project, combining their modifications back into the main repository when organized, this enhances spread development.

GitHub supports in pull requests via code review where it allows thorough considerations about recommended changes, cultivating code quality over peer review.

It also supports in marching plus branching by making branches to operate on features autonomously, merging them solely after detailed assessment and review

Having Continuous Integration and Continuous Deployment by testing and placement developments, making sure that the codebase stays established then decreasing the overhead of manual testing.

Question 2

A repository lets you form and share code, work together with others, accomplish project workflows and keep tabs on any changes. So a GitHub repository, known as a "repo," is a place where your project's files plus their corrected history are kept in.

When creating a new repository on GitHub, I need to first sign in to GitHub, then after click on the plus icon and select new repository in the dropdown menu. Then after I will need to add my details which are the repository name, choose to either make it public or private, make modifications with a README, I can put gitgnore as well by indicating a template whether I want to dismiss assured files from being tracked by Git. Then after selecting a license.

The essential elements are:

Documentation which explains the projects API, and other details.

A license file is essential for open-source projects because it identifies how people are able to use, change, or allocate your code.

A README file offers an outline of your project, plus the guidelines on how to build it etc. When visited on the repository the first file a visitor sees.

Gitignore files states which files to disregard in a project. For example, you might want to ignore, necessities, built files plus system files.

Pull requests are fundamental to the collective phases of GitHub as they permit you to analysis by reviewing and deliberate recommended changes to your project.

Question 3

Version control is a system that registers alterations to files, permitting you to keep track and accomplish various versions of your files. In the context of software development, you can keep tabs on code changes, degenerate to former stages, having team work on code with others. In context with Git as well, is intended to handle the whole thing from minor to very big projects with speed and productivity.

For example if you want to develop a web application, you can begin by creating a Git repository. After collaborating with GitHub by using “git remote add origin” and to push it to local repository to GitHub using git push –u origin master. Then after I can create a feature branch. For the developer to add a new feature to the web application. Then after the developer can push their feature branch to GitHub. On GitHub, the developer therefore creates a pull request (PR) to merge their feature branch into the master branch. The team reviews the PR, discusses some required changes, and supports it. After the PR is permitted, it is combined into the master branch. Then other developers can resolve conflicts when needed.

The way in which GitHub enhances version control is by Centralized Hosting, ensuring easy to share or send your code and work together on projects anywhere.

Another enhance is collaboration that includes code reviews and pull requests.

Having Issue Tracking can be associated to exact pull requests and commits for enhanced traceability and context, by enabling people to track bugs etc.

GitHub incorporates with numerous CI tools to repeatedly form and test code for changes. This makes certain that new commits don’t breakdown the current codebase.

GitHub is a most important platform aimed at open source projects.

Question 4

In GitHub, a branch is basically a similar version of the repository. Branches are important for version control because they assist numerous developers to work on similar project deprived of meddling with each other's work. It’s also important as it let developers to work on various features, fixing of fixes, or trials in separation from the key codebase.

When creating a branch you can start by using the command onto the command line “new-feature-branch” then it changes to it. Then go to your repository on GitHub, then choose the branch selector dropdown, after type into the box a new branchname. Now you can click on the create branch.

When wanting to make changes I need to change to the new branch and then make my changes then after my changes will be staged using git add, as every stages will be changed ad by replacing “.” with file paths will assist in staging exact files. Thereafter I’ll commit the changes then push the changes into GitHub.

When merging the branch back into the main branch I will first go into my repository on GitHub you will realize you will frequently realize a swift to create a pull request for your lately pushed branch. Click on the "Compare & pull request” thereafter make a title and description within and for your pull request. Submit the pull request. Then people working with you will review your pull request. Once everything is set in place or approved, it can therefore be marched. After all that click "Merge pull request" button on the GitHub then confirm the merge.

Question 5

Pull Requests is a way to suggest and discuss changes to codebase before merging them into the main project.

How it assists in facilitating code reviews is by:

For example you start to create a new feature that permits people to log in with their Microsoft.

Documentation, which keeps record of discussions and changes. For example, yet to come team members are able to envision why and how the Microsoft login feature was placed and added.

Testing, which is programmed to be automated to operate to evaluate or check errors. For example your pull request causes tests that make sure the new feature functions and doesn’t destroy remaining functionality.

Having reviews as collaborators can evaluate codes, make sure there’s quality and recommend changes.

Collaboration as teams can talk over the changes in one setting or location, anywhere. Where a collaborator known as your teammate will recommend a improved method to control the redirect URL.

The steps to create and review a pull request are as follows:

Step 1: Make a Pull Request by pushing your changes to a new branch and create a pull request on GitHub. Then after in the title use "Add Microsoft login feature" and your description can be "This pull request adds a new feature to allow people and users to log in with Microsoft."

Step 2 will be the reviewing of the Pull Request whereas a teammate reviews the pull request, comments on specific lines, and recommends progresses. After you will make the suggested changes and push them to the branch. Once all feedback is addressed, the pull request is approved and merged into the main branch. All done!

Question 6

GitHub Actions is a tool in GitHub that aids you program tasks in your software development process. It lets you run jobs like deploying code, testing and building at any time assured events happen in your GitHub repository, like when you create a pull request or push code.

You outline workflows using YAML files in the .github/workflows directory of your repository. Each workflow file defines the tasks to be run and the circumstances for running them.

An example of creating a Continuous Integration (CI) and Continuous Deployment (CD) pipeline for a Node.js application. This will run or program tests every time code is pushed to the main branch. Then you'll have to deploy the application to a staging environment if the tests pass. Thereafter you can start by creating or make the Workflow File. Then make a file named "ci-cd.yml" within the ".github/workflows/" directory of your repository.

Question 7

Visual Studio is a strong software development environment designed for bigger projects and enterprise-level applications. It gives a wide range of features and tools in order to help developers during the whole software development process.

The key features are:

Complete Development Environment, where tools like diagnostic and debugging is advanced. And supports many programming languages and gives navigation tools plus code refactoring in order to advance code quality.

Extensibility which allows entry to a range of plugins and as well extensions by means of the Visual Studio Marketplace.

They have good collaboration which enables code reviews to guarantee code quality.

Having integrated tools for every stages by ensuring there's version control by built-in Git. It offers database tools and integrates with SQL Server. Widely supports with web development with frameworks like Node.js.

Here are the differences between:

Scope where Visual Studio Code is lightweight, multipurpose code editor suitable for countless development tasks. While Visual Studio is aimed for full-featured IDE for difficult, bigger scaled projects.

With performance Visual Studio Code is lightweight plus improved for speed, presenting rapid and better startup and performance. While Visual Studio is resource based in line for its widespread built-in tools.

In regards to support of platforms, Visual Studio Code is completely cross-platform, supporting various operating systems such as Linux, Window and MacOS. While Visual Studio is mostly obtainable on Windows, with restricted MacOS versions.

With extensibility Visual Studio Code depends on more on extensions for extra added features, allowing the core editor insubstantial.

Question 8

Step 1: Confirm that Visual Studio has Git tools installed.

Step 2: Open Visual Studio then head to “Team Explorer” after click “Clone” you will then add your GitHub repository URL, in addition select a local folder. After then click “clone” to clone a repository.

Step 3: Log into your GitHub account when it’s stimulated to authenticate.

Step 4: now I can work on my Visual code by editing, opening file or folders then use “Team Explorer” to make changes with GitHub thereafter manage branches.

Step 5: Accomplish pull requests and GitHub issues straight from Visual Studio which us collaborating efficiently.

Integrating a GitHub repository with Visual Studio is able to considerably improve your development workflow by giving seamless version control, abilities in collaboration plus integration with numerous tools in the project management. Having also better automation, which are Modernize development with CI/CD pipelines integrated from the Visual Studio.

Question 9

Here’s a look at the primary debugging tools offered by Visual Studio and how developers can utilize them effectively:

There is Watch Windows, which observes variable values and expressions in present time as you go through code with added variables to watch and track changes to pinpoint issues.

Another debugging tool can be call stack navigation. Call Stack Window shows technique call hierarchy, letting users go to earlier conditions in your code. It benefits to help you comprehend how the program get hold of its present state and trace problems back to their roots. Developers are able to trace method calls to understand the sequence leading to errors.

Breakpoints break code execution at precise elements to examine variables and comprehend program movement. Which arranges breakpoints by clicking in the code editor's left margin and accomplish them to break in detailed conditions. Developers use breakpoints to stop execution at serious critical areas and enter through code to examine its behavior.

With immediate windows we can perform code snippets and assess expressions throughout debugging deprived of changing the program state forever and it can be convenient for testing and verifying assumptions fast. Developers can test code extracts and adjust variable values to confirm assumptions.

When using diagnostic tools windows it suggests performance and analytical to examine application performance, therefore it assists in identifying performance bottlenecks, memory disclosures plus other issues disturbing program performance. Developers can evaluate performance metrics in order to classify and decide resource-intensive issues.

Question 10

You can fix issues or generate new features on separate branches in Visual Studio, at that time you can use GitHub to combine these variations back into the core project, which overall they help with easy collaboration.

GitHub is able to routinely run tests or deploy updates. Visual Studio joins to these procedures to create development easier, good in automating tasks.

GitHub gives team members an opportunity to review each other's code changes. While Visual Studio aids you understand and fix some issues before merging, this is reviewing and improved coding.

GitHub keeps all your project's code in a single location. While Visual Studio allows you enter and update this code straight, which they both share code repository.

We are a team of developers' workers working for a skincare company we need to build a website application using Node.js:

We will clone the Node.js code from GitHub into Visual Studio. Which works on their parts, like the frontend and backend features. GitHub's pull requests assists the skincare website team to review changes. Visual Studio displays any alterations in the code and aids resolved conflict which is collaborating.

GitHub supervises tasks and bugs. Whereas Visual Studio joins changes straight to those issues, making it sure and clear what each change is fixing, which is knowing for tracking issues. Therefore my application can be released.

Citations

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