DWA_01.3 Knowledge Check_DWA1

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1. Why is it important to manage complexity in Software?

- Managing complexity in software development is about creating software that is easier to understand, maintain, and evolve over time. It promotes better collaboration, reduces risks, and ultimately leads to higher-quality, more reliable software products

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2. What are the factors that create complexity in Software?

- Poor Abstraction and Modularity - Failure to properly abstract and modularize code can lead to interdependencies between components, making it hard to understand how they interact and maintain them.
- Lack of Documentation: Inadequate or outdated documentation can hinder understanding and increase the time it takes to decipher the software's functionality.
- Lack of Testing: Insufficient testing practices can result in undetected bugs and issues, leading to complexity when trying to identify and resolve problems.
- Technological Debt: Choosing suboptimal technologies or avoiding necessary upgrades can lead to a more complex, less efficient system over time.
- Lack of Code Reviews: Absence of code reviews or peer feedback can allow suboptimal or complex code to be merged without proper scrutiny.

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3. What are ways in which complexity can be managed in JavaScript?

- Modularization: Break your code into smaller, reusable modules that focus on specific functionality. This promotes a clear separation of concerns and makes it easier to manage and test individual components.
- Avoid Global Variables: Minimize the use of global variables to prevent unintended interactions between different parts of your code.

- Code Reviews: Regularly conduct code reviews with team members to identify and address complex or unclear code segments.
- Documentation: Write clear comments and documentation that explain the purpose, behavior, and usage of your functions and modules.
- Testing: Write comprehensive unit tests and integration tests to catch issues early and pro
- Version Control: Use version control systems like Git to track changes, facilitate collaboration, and enable easy rollback if needed.vide a safety net when making changes.
- Consistent Naming Conventions: Use consistent and descriptive naming conventions for variables, functions, and modules to improve code readability.

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4. Are there implications of not managing complexity on a small scale?

Failing to manage complexity in small-scale software projects can lead to numerous negative consequences. These include increased bug density, reduced maintainability, slower development, high learning curves for new team members, unpredictable behavior, limited code reusability, accumulating technical debt, inefficient debugging, higher maintenance costs, limited collaboration, developer frustration and burnout, inhibited innovation, user experience issues, and ineffective code reviews. Prioritizing code simplicity and effective management is crucial to prevent these implications and maintain a successful project.

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5. List a couple of codified style guide rules, and explain them in detail.

- Use Descriptive Variable and Function Names - Choose meaningful and descriptive names for variables, functions, and other identifiers. Avoid using vague or overly short names that don't convey the purpose of the entity. Descriptive variable and function names improve code readability and make it easier for other developers to understand the purpose and usage of different components

Example:
```
// Poor Naming
let x = 10;
```

```
function f(a, b) {
   return a * b;
}

// Improved Naming
let numberOfItems = 10;
function calculateProduct(a, b) {
   return a * b;
}
```

- Variable and function names written as camelCase
- Global variables written in UPPERCASE
- Prefer Template Literals Over String Concatenation - Template literals provide a cleaner and more readable way to concatenate strings and include variables. They also support multiline strings without the need for special escape characters
- Prefer using strict equality (===) and inequality (!==) operators over loose equality (==) and inequality (!=) operators. Strict equality checks both value and type, while loose equality only checks value. Using strict equality helps prevent unexpected type coercion and produces more predictable comparisons

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6. To date, what bug has taken you the longest to fix - why did it take so long?

The JS Event Handler : Drag and Drop of the Kitchen App, the dragging state and hover effects. Sometimes, understanding and debugging code, especially in a complex context, can take time to ensure that the solution is accurate and comprehensive.
