DWA_01.3 Knowledge Check_DWA1

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1. Why is it important to manage complexity in Software?
    - Maintainability of the code will be made easier as well-structured code is easier to maintain
    - Debugging well-structured code is more efficient than debugging complex code
    - The collaboration of team members working on the software in the future will be made easier. Working on smaller, less complex, parts of code is easier than working on a large and complex codebase
    - Scalability of the software is made more efficient as the software is well-structured and therefore becomes easier to work with when scaling
    - Well-structured code that is not complex can have reusable components that will save effort and time on future softwares
    - Testing the code to ensure it functions correctly becomes simpler if the code itself is well-structured and simplified
    - Complex code can hide security risks
    - Code that is organized well can be documented well
    - Complex code can lead to more development and maintenance costs

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2. What are the factors that create complexity in Software?
    - As software grows in size and scale, its codebase becomes more complex
    - Insufficient documentation or documentation that is not kept up to date can cause complication for developers trying to understand the code
    - Repeating code can lead to increased complexity and chances of errors as the codebase grows
    - Inconsistent naming conventions can lead to misunderstandings and decreased maintainability
    - Older code that has not been kept up to date and refactored can accumulate technical debt that leads to increased complexity
    - Reliance on external libraries or frameworks can cause increased complexity if they are not documented correctly
    - Not testing the code can lead to bugs

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

- Automated testing of code helps find bugs in the code
- Keeping documentation up-to-date and clear helps prevent misunderstanding and improves readability of the code
- Periodically refactoring the code to simplify and prevent repetition can reduce complexity in the code base
- Using consistent naming conventions can prevent repetition and misunderstanding
- Using version control systems to track changes to the codebase can decrease complexity

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

There are multiple implications of not managing complexity at a small scale, as codebases usually grow, and therefore the complexity will grow. The following are implications of not managing complexity at a small scale:

- Code that is too complex becomes more difficult to maintain and can therefore lead to technical debt
- Complex code can lead to slower development as the codebase grows and becomes more complex to work with
- The scalability of the software will be reduced as it is more difficult to add to a codebase that is complex
- It will become difficult to reuse components of the codebase if it is too complex(not ebay to understand)

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

- Use consistent naming conventions to ensure that your code is more maintainable and readable . If all developers working on a codebase follow the same naming conventions, it will prevent misunderstandings and errors, and lead to increased maintainability.
- Limit line length when writing code. This will increase readability and avoid horizontal scrolling in code editors, making it easier for developers to work with

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6. To date, what bug has taken you the longest to fix - why did it take so long?
The bug that was created by my file path being incorrect in the IWA final capstone. I was unable to understand the error that was showing up in the console and felt demotivated. I lost a lot of time feeling like I was getting nowhere despite doing so much research, and it resulted in me feeling like I did not know as much as I thought I did. I eventually managed to find the solution after stumbling upon the answer given to someone with a similar issue on a coding forum. I then managed to get to work and eventually finish my final capstone.
