To do: Make a submission

Opened: Thursday, 11 July 2024, 12:05 AM
Due: Thursday, 18 July 2024, 11:55 PM

Assignment Instructions:

This assignment will not only offer you practical benefits but also foster a deeper understanding of number systems and mathematical operations, equipping you with valuable skills for various fields in computer science and engineering.

In this assignment you will design a digital calculator showcasing binary arithmetic, implementing binary adder, subtractor, multiplier, and divider modules. Highlight benefits of binary computation while integrating these modules into a CPU for seamless operations, promoting understanding of number systems.

Scenario:

Imagine you are part of a team working on designing a new digital calculator for a mathematics competition. Your task is to implement various arithmetic operations on binary numbers, including addition, subtraction, multiplication, and division. This calculator aims to showcase the efficiency and versatility of binary arithmetic in solving mathematical problems.

Assignment:
   1. Compose a detailed explanation of how you would design and develop the binary adder, subtractor, multiplier, and divider modules for the calculator.
   2. Illustrate how you would integrate and organize these modules to ensure seamless mathematical operations.
   3. Provide detailed examples of binary calculations for each operation to demonstrate the functionality of your design.
   4. Summarize the advantages and challenges of using binary arithmetic in comparison to decimal arithmetic.
   5. Highlight the significance of designing such a calculator in promoting a deeper understanding of number systems and mathematical operations.

Submission Instructions:

- Submit the solution in a word document.
- Make sure your submission is double-spaced, using Times New Roman, 12-point font, with 1" margins.
- Use sources to support your arguments. Add a reference list at the end of the submission.
- For assistance with APA formatting, view the [Learning Resource Center: Academic Writing](#).
- Your submission should be clearly written, concise, and well organized, and free of spelling and grammar errors. Read the grading rubric to understand how your work will be evaluated.

This assignment will be assessed by your instructor using the rubric below.

Add submission

Submission status

Attempt number	This is attempt 1.
Submission status	No submissions have been made yet
Grading status	Not graded

Time remaining	7 days 16 hours remaining

Grading criteria

Q1. Explanation of design and development of Binary Arithmetic Modules	Presents an exceptionally detailed and innovative explanation of the design and development for binary adder, subtractor, multiplier, and divider modules, showcasing deep understanding and creativity. **25 points**	Provides a comprehensive explanation of the design and development for all modules with thoughtful considerations. **20 points**	Presents an explanation of the designs and development for the modules, but with some gaps or inconsistencies. **12 points**	Provides incomplete or inaccurate module designs. **3 points**
Q2. Integration and Organization	Demonstrates an ingenious and seamless integration strategy for the modules, ensuring a cohesive calculator design. **20 points**	Provides a well-thought-out approach to integrating and organizing the modules for effective mathematical operations. **16 points**	Presents an approach to integration, but with some ambiguities or oversights. **10 points**	Offers an unclear or insufficient strategy for integrating the modules. **0 points**
Q3. Examples of Binary Calculations	Presents exemplary and comprehensive binary calculation examples for each operation, highlighting the functionality and accuracy of the design. **15 points**	Provides clear and accurate examples that effectively illustrate the operations' functionality. **12 points**	Presents examples, but with minor errors or inconsistencies. **7 points**	Offers examples that are incorrect or lack clarity. **0 points**

Q4. Advantages and Challenges of Binary Arithmetic	Offers an insightful, well-researched summary of the advantages and challenges of binary arithmetic, showcasing a deep understanding of its implications. *15 points*	Provides a solid summary of advantages and challenges, supported by relevant insights. *12 points*	Offers a basic summary, but with limited depth or accuracy. *7 points*	Provides an incomplete or inaccurate summary of advantages and challenges. *0 points*
Q5. Significance of the Calculator	Presents a profound and well-supported explanation of how the binary arithmetic calculator promotes a deeper understanding of number systems and mathematical operations, with clear connections to real-world applications. *20 points*	Offers a clear explanation of the significance of the calculator, highlighting its educational and practical implications. *16 points*	Provides a basic explanation, but with some missing connections or insights. *10 points*	Offers a vague or incomplete explanation of the calculator's significance. *0 points*

Sources and Evidence	Demonstrates consistent use of credible, relevant sources to support ideas that are situated within the discipline and genre of the writing. *5 points*	Demonstrates an attempt to use credible and/or relevant sources to support ideas that are appropriate for the discipline and genre of the writing. However, the use of credible and relevant sources is not consistent. *4 points*	Demonstrates an attempt to use sources to support ideas in writing. Yet, most sources provided are not credible / relevant to the discipline and genre. *2 points*	Uses no sources to support ideas in writing. *0 points*