

NUMBER SYSTEMS

1. Convert the binary number 101_2 to decimal: _____

2. Convert the binary number 1010_2 to decimal: _____

3. How are the two questions above related?

4. Convert the binary number 10101_2 to decimal: _____

5. How are questions 2 and 4 related?

6. Convert the binary number 101011_2 to decimal: _____

7. Describe a program that calculates the binary equivalent of any decimal number:

8. Convert the decimal number 11_{10} to binary: _____

9. Convert the decimal number 116_{10} to binary: _____

HEXADECIMAL

10. Convert the hexadecimal numbers C_{16} , D_{16} , and E_{16} to binary:

11. Express the hexadecimal number $CODE_{16}$ as a sum of 4 terms in decimal: (i.e. $__ \cdot 16^3 + __ \cdot 16^2 + \dots$)

12. Convert the hexadecimal number $CODE_{16}$ to binary:

13. Convert the binary number: 100100110_2 to hexadecimal:

BITWISE OPERATORS

14. What is the value of $1010_2 \mid 110_2$? _____
15. What is the value of $1010_2 \& 110_2$? _____
16. What is the value of $1010_2 \wedge 110_2$? _____
17. What is the value of $1010_2 \ll 10_2$? _____
18. What is the value of $1010_2 \gg 10_2$? _____
19. What is the value of $C05126_{16} \wedge CBE245_{16} \wedge C05126_{16}$? _____

TWO'S COMPLEMENT

20. What is the complement of $0101\ 0000\ 1100\ 1111_2$? _____
21. What is the 16-bit two's complement binary representation of the decimal number 116_{10} ? _____
22. What is the 16-bit two's complement binary representation of the decimal number -116_{10} ? _____
23. What is the 16-bit two's complement hexadecimal representation of the decimal number -116_{10} ? _____
24. What is the decimal representation of the 16-bit two's complement hexadecimal number $FFFE_{16}$? _____

CHALLENGE

25. Convert the binary numbers 0.1_2 and 0.01_2 to decimal: _____
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