**Lowest Common Ancestor**

**Binary Tree**

**Solve:**

Given this example binary tree below, and the given example, the output can be correlated to the given key to find the corresponding letters. Then combine the letters to find the clue.

Using this same logic and methodology solve Problems 1, 2, and 3. Once each LCA has been found, find the corresponding letter in the key. Then combine the letters to solve each problems clue. Once all three clues have been solved for, combine all the clues to find the final answer.

**Example Output**

**Example 1: LCA(4, 5) = 2**

**Example 2: LCA(4, 6) = 1**

**Example 3: LCA(3, 4) = 1**

**Example 4: LCA(6, 7) = 3**

**Key**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **A** | **=** | **26** |  | **G** | **=** | **2** |  | **M** | **=** | **8** |  | **S** | **=** | **15** |  | **Y** | **=** | **18** |
| **B** | **=** | **5** |  | **H** | **=** | **22** |  | **N** | **=** | **19** |  | **T** | **=** | **24** |  | **Z** | **=** | **11** |
| **C** | **=** | **4** |  | **I** | **=** | **20** |  | **O** | **=** | **1** |  | **U** | **=** | **6** |  |  |  |  |
| **D** | **=** | **3** |  | **J** | **=** | **9** |  | **P** | **=** | **23** |  | **V** | **=** | **17** |  |  |  |  |
| **E** | **=** | **25** |  | **K** | **=** | **10** |  | **Q** | **=** | **12** |  | **W** | **=** | **7** |  |  |  |  |
| **F** | **=** | **16** |  | **L** | **=** | **14** |  | **R** | **=** | **13** |  | **X** | **=** | **21** |  |  |  |  |

**G**

\_\_\_\_\_\_\_\_

Example 1

**O**

\_\_\_\_\_\_\_\_

Example 2

**O**

\_\_\_\_\_\_\_\_

Example 3

**D**

\_\_\_\_\_\_\_\_

Example 4

\*This is the clue

**Problem 1**

**Find the Output**

**P1: LCA(39, 60) = \_\_\_\_\_\_\_**

**P2: LCA(11,26) = \_\_\_\_\_\_\_**

**P3: LCA(26,39) = \_\_\_\_\_\_\_**

**P4: LCA(6,11) = \_\_\_\_\_\_\_**

**P5: LCA(12,17) = \_\_\_\_\_\_\_**

**Key**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **A** | **=** | **6** |  | **G** | **=** | **8** |  | **M** | **=** | **35** |  | **S** | **=** | **12** |  | **Y** | **=** | **23** |
| **B** | **=** | **60** |  | **H** | **=** | **5** |  | **N** | **=** | **13** |  | **T** | **=** | **38** |  | **Z** | **=** | **50** |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **C** | **=** | **41** |  | **I** | **=** | **30** |  | **O** | **=** | **9** |  | **U** | **=** | **3** |  |  |  |  |
| **D** | **=** | **43** |  | **J** | **=** | **31** |  | **P** | **=** | **39** |  | **V** | **=** | **1** |  |  |  |  |
| **E** | **=** | **29** |  | **K** | **=** | **20** |  | **Q** | **=** | **17** |  | **W** | **=** | **42** |  |  |  |  |
| **F** | **=** | **19** |  | **L** | **=** | **40** |  | **R** | **=** | **22** |  | **X** | **=** | **27** |  |  |  |  |

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**P1**

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**P3**

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**P2**

\_\_\_\_\_\_\_

**P4**

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**P5**

**Problem 2**

**01000101**

**01010000**

**00011000**

**01010100**

**01001011**

**00011100**

**00001111**

**01011010**

**01010001**

**01001000**

**00010100**

**00000001**

**01011111**

**01010111**

**01001010**

**01000110**

**00010110**

**00010001**

**00000000**

**Key**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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**\_Find the Output**

**P6: LCA(17,22) = \_\_\_\_\_**

**P7: LCA(75,95) = \_\_\_\_\_**

**P8: LCA(1,75) = \_\_\_\_\_**

**P9: LCA(0,22) = \_\_\_\_\_**

P10: **LCA(22,28)=\_\_\_\_\_**

\_\_\_\_\_\_\_

**P10**

\_\_\_\_\_\_\_

**P9**

\_\_\_\_\_\_\_

**P8**

**Empty Space**

\_\_\_\_\_\_\_

**P7**

\_\_\_\_\_\_\_

**P6**

**Problem 3**

**Key**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | **A** | **=** | **26** |  | **G** | **=** | **10** |  | **M** | **=** | **61** |  | **S** | **=** | **37** |  | **Y** | **=** | **18** | | **B** | **=** | **44** |  | **H** | **=** | **45** |  | **N** | **=** | **2** |  | **T** | **=** | **47** |  | **Z** | **=** | **77** | | **C** | **=** | **20** |  | **I** | **=** | **4** |  | **O** | **=** | **75** |  | **U** | **=** | **14** |  |  |  |  | | **D** | **=** | **6** |  | **J** | **=** | **7** |  | **P** | **=** | **54** |  | **V** | **=** | **1** |  |  |  |  | | **E** | **=** | **58** |  | **K** | **=** | **51** |  | **Q** | **=** | **62** |  | **W** | **=** | **28** |  |  |  |  | | **F** | **=** | **12** |  | **L** | **=** | **63** |  | **R** | **=** | **39** |  | **X** | **=** | **30** |  |  |  |  | | **=** | **6** |  | **G** | **=** | **8** |  | **M** | **=** | **35** |  | **S** | **=** | **12** |  | **Y** | **=** | **23** |
|  | **=** | **60** |  | **H** | **=** | **5** |  | **N** | **=** | **13** |  | **T** | **=** | **38** |  | **Z** | **=** | **50** |
| **C** | **=** | **41** |  | **I** | **=** | **30** |  | **O** | **=** | **9** |  | **U** | **=** | **3** |  |  |  |  |
| **D** | **=** | **43** |  | **J** | **=** | **31** |  | **P** | **=** | **39** |  | **V** | **=** | **1** |  |  |  |  |
| **E** | **=** | **29** |  | **K** | **=** | **20** |  | **Q** | **=** | **17** |  | **W** | **=** | **42** |  |  |  |  |
| **F** | **=** | **19** |  | **L** | **=** | **40** |  | **R** | **=** | **22** |  | **X** | **=** | **27** |  |  |  |  |

**Find the Output**

**P11: LCA(4,E) = \_\_\_\_\_**

**P12: LCA(37,4D) = \_\_\_\_\_**

**P13: LCA(A,20) = \_\_\_\_\_**

**P14: LCA(4,4D) = \_\_\_\_\_**

\_\_\_\_\_\_\_

**P11**

\_\_\_\_\_\_\_

**P13**

\_\_\_\_\_\_\_

**P12**

\_\_\_\_\_\_\_

**P14**