***20011393 - Data structures and Algorithms CW***

*KEYS: 97, 9, 50, 51, 99, 86, 84, 41, 72, 14*

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Binary Heap Trace:*** | | | | | | | | | | |
| H1 | H2 | H3 | H4 | H5 | H6 | H7 | H8 | H9 | H10 |
| I97 | x | I50 | x | I99 | I86 | I84 | x | I72 | x |
|  | I9 |  | I51 |  |  |  | x |  | x |
|  |  |  |  |  |  |  | I41 |  | I14 |

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| ***Heap Build Trace:*** | | | |
| x14 | X41 | X9 | X14 |

|  |  |  |  |  |  |  |  |  |  |
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| ***Heap Sort Trace:*** | | | | | | | | | |
| M9 | M14 | M41 | M50 | M51 | M72 | M84 | M86 | M97 | M99 |
| L | L | R | L | L | R | L | L | X99 |  |
| R | L | R | L | X86 | X99 | X97 | X99 |  |  |
| X99 | X72 | X97 | X97 |  |  |  |  |  |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***AVL Trace:*** | | | | | | | | | |
| I97 | I9L97 | I50R9 | I51L97 | I99R97 | I86R51 | I84L86 | I41R9 | I72L84 | I14R9 |
|  |  | R50 |  |  | R51 |  | R41 | R84 |  |
|  |  |  |  |  | R51 |  |  |  |  |

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| --- | --- |
| ***Hash Table (1)*** | |
| ***Bucket:*** | ***Values:*** |
| 0 | 99 |
| 1 | 86 |
| 2 | 41 |
| 3 | 72 |
| 4 | 14 |
| 5 |  |
| 6 | 50 |
| 7 | 51 |
| 8 | 84 |
| 9 | 97 |
| 10 | 9 |

|  |  |  |  |  |  |  |  |  |  |
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| ***Hash Table (1) Trace:*** | | | | | | | | | |
| P9 | P9 | P6 | P7 | P0 | P9 | P7 | P8 | P6 | P3 |
| I97@9 | P10 | I50@6 | I51@7 | I99@0 | P10 | P8 | P9 | P7 | P4 |
|  | I9@10 |  |  |  | P0 | I84@8 | P10 | P8 | I14@4 |
|  |  |  |  |  | P1 |  | P0 | P9 |  |
|  |  |  |  |  | I86@1 |  | P1 | P10 |  |
|  |  |  |  |  |  |  | P2 | P0 |  |
|  |  |  |  |  |  |  | I41@2 | P1 |  |
|  |  |  |  |  |  |  |  | P2 |  |
|  |  |  |  |  |  |  |  | P3 |  |
|  |  |  |  |  |  |  |  | I72@3 |  |

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| --- | --- |
| ***Hash Table (2)*** | |
| ***Bucket:*** | ***Values:*** |
| 0 | 99 |
| 1 | 86 |
| 2 | 41 |
| 3 | 72 |
| 4 | 14 |
| 5 |  |
| 6 | 50 |
| 7 | 51 |
| 8 | 84 |
| 9 | 97 |
| 10 | 9 |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Hash Table (2) Trace:*** | | | | | | | | | |
| P9 | P9 | P6 | P7 | P0 | P9 | P7 | P8 | P6 | P3 |
| I97@9 | P10 | I50@6 | I51@7 | I99@0 | P1 | P8 | P2 | P3 | P4 |
|  | I9@10 |  |  |  | I86@1 | I84@8 | I41@2 | I72@3 | I14@4 |