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CST 370

Extra Credit Homework

February 22, 2016

1a. 15

1b. 0

1c. 0

1d. The recursion will never end because the end condition (n=0) will never be met.

2 1+ (1/2 + ¼ + 1/8 + …)= 1 + 1 = 2

3. 0(log n), O(log log n), O(n), O(nlogn), O(n2)

4. Sorts A in ascending order, O(n2)

5. a. In each case, the problem size is the number of people in the room. b. Alg 1: one question, Alg 2: ask everyone, n questions; Alg 3 ask everyone, however it requires k questions to ask each kth person. So there will be 1 + 2 + 3…n questions asked…n(n+1)/2 c. constant, linear, quadratic

6.

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| 0 | 97 | 1 | 3 | 5 | 0 |

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| 0 | 97 | 1 |  | 3 | 5 | 0 |

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| 0 |  | 97 | 1 |  | 3 |  | 5 | 0 |

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| 0 |  | 97 |  | 1 |  | 3 |  | 5 |  | 0 |

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| 0 |  | 1 | 97 |  | 3 |  | 0 | 5 |

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| --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 97 |  | 0 | 3 | 5 |

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| --- | --- | --- | --- | --- | --- |
| 0 | 0 | 1 | 3 | 5 | 97 |

7.

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| 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 1 |
| 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 1 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |