

CS 312 Homework

Submit each homework as a PDF file through Learning Suite before the due time. Plan on submitting early as sometimes there are glitches when you try to submit just before the due time. You may submit multiple times if needed. We grade the last submission received before the due time. Note that older editions of the book do not have the same homework numbering. If you use an older edition it is your responsibility to make sure you are doing the right questions.

Show your work. That can also allow you get partial credit if your answer is wrong. Communicating clearly and concisely what you have to say is an important skill you will use throughout your career. If you cannot clearly communicate something, there is a good chance that you do not yet understand it well. Good writing, grammar, punctuation, etc. are important and will affect your grade. All written assignments are to be neat and professional. Homework may be handwritten and scanned as a PDF if you wish. Review all PDFs after submitting to ensure they are easily legible.

| # | Problems – points per problem shown in parenthesis |
|----|---|
| 1 | Complexity |
| 2 | 1.7 (3), 1.25 (2), solve $2^{21} \bmod 18$ using the algorithm of Fig. 1.4; show a table with all variable values at each call level (5). |
| 3 | 1.18 (2), 1.20 (5), 1.27 (3) |
| 4 | 2.4 (3), 2.5 (a-e, only find bounds using the master theorem) (5), 2.17 (2) |
| 5 | 2.19 (5), 2.23 (5) (if you give a good effort on 23b you get full credit as it is harder) |
| 6 | 3.1 (4), 3.2 (6) (Show DFS forest and all edges in forest) |
| 7 | 3.3 (4), 3.4 (6) |
| 8 | 4.1 (10) |
| 9 | 4.2 (10) (for consistency, use distances from the previous column, remember to start from node S) |
| 10 | 5.2 (10) (for b do not use path compression, and if there is a tie in rank when doing union, make the first alphabetical node the root) |
| 11 | 5.13 (5), 5.14 (5) |
| 12 | 5.26 (5), 5.28 (5) |
| 13 | 6.1 (10) |
| 14 | Gene and Knapsack |
| 15 | Chain Matrix and All Paths |
| 16 | 7.1 (5), 7.3 (5) For 7.3, use a linear program solver you find online to solve your program and provide a screenshot of the solution. |
| 17 | 7.11 (5), 7.13 (5) |
| 18 | B&B TSP1 |
| 19 | B&B TSP2 |
| 20 | Local Search |