

Assignment 2

Due: Tuesday, June 27, 2017, upload before 11:30pm

- 1) (10 pts.) Do Exercise 36 of Section 1.5 (page 68).
- 2) (10 pts.) Do Exercise 34 of Section 1.6 (page 80).
- 3) (10 pts.) Do Exercise 18 of Section 1.7 (page 91).
- 4) (10 pts.) Do Exercises 2 and 4 of Section 1.8 (page 108).
- 5) (20 pts.) Given is an array A of size n containing integers in arbitrary order; n is even. For each of the problems described below describe and analyze an efficient algorithm.
Explain your solution in a pseudo code. Explain the achieved running times in big-O. Include a brief description on the correctness of your algorithm.
 1. MaxPart: Partition the n integers in array A into two sets $S1$ and $S2$, each of size $n/2$, such that the difference between the sum of the elements in $S1$ and the sum of the elements in $S2$ is a maximum.
 2. MinDiff: Find the minimum pairwise difference δ for the elements in array A . It is defined as the minimum so that $|A[i] - A[j]| \geq \delta$ for all i and j .
- 6) (20 pts.) Arrange the following functions in order such that each function is big- O of the next function: $2 \cdot 3^n$, $3n!$, $19 \log n$, $\frac{n^3}{10^5}$, $n^2 \log n$, $14n^n$, \sqrt{n} , $3 \cdot 2^n$. Prove your answer is correct by giving the values of C , K for each pair of consecutive functions..
- 7) (20 pts.) A driver wants to go from $Loc1$ to $Loc2$ with his car. The car tank can hold enough gas to travel d miles. The driver has a map that gives the distances between gas stations on his route. The distance between any consecutive stations is $\leq d$. The drivers wants to make as few stops as possible.

Find an efficient algorithm to find which gas stations to stop. The input $Dist[1, \dots, n-1]$ is an array of $n-1$ values, where n = total number of gas stations, $D[i]$ is the distance from gas station G_i to gas station G_{i+1} .

Note: As you will have read on the course website, you need to submit your answers typed and as one PDF file named LastName.FirstName.2.PDF before the due date stated above. Follow the the template given at <https://www.cs.purdue.edu/homes/amahmoo/cs182summer2017/homeworksolutiontemplate.pdf>.