Ann, Bob, Charlie (*replace with your names*)
COSC 417
3/19/2020

Assignment 9

Instructions.

1. Due April 30.

2. This is a team assignment. Work in teams of 3-4 students. Submit one assignment per team, with the names of all students making the team.

3. You will submit on **Blackboard** one single pdf file with the solutions to all exercises. For this you'll take the .tex file for this assignment and modify it. In the box above replace Ann, Bob, Charlie with your names. Write down your anwers for each question after **Answer:**.

   For editing the above document with Latex, see the template posted on the course website.

   `http://orion.towson.edu/~mzimand/adatastruct/assignment-template.tex` and

   `http://orion.towson.edu/~mzimand/adatastruct/assignment-template.pdf`

   To append in the latex file a .jpg file (for a photo; for example, in case you draw a picture by hand and take a photo of it with your phone camera), use

   ```
   \includegraphics[angle=270,origin=c,width=\linewidth]{file.jpg}
   ```

   The parameter angle=270 is for rotating the photo, and you may have to change 270 to whatever angle works for your photo.

Exercise 1. Do exercise 7.1 a, b, e, f. (page 322 in the textbook)
Answer:

Exercise 2. (a) Find a satisfying assignment for the following instance of the 3SAT problem:

$$(x \vee y \vee \neg z) \wedge (x \vee \neg y \vee z) \wedge (\neg w \vee x \vee \neg y) \wedge (\neg w \vee \neg x \vee z)$$

Answer:

(b) Count the number of satisfying assignments for the boolean formula above.
Answer:

Exercise 3 Use the algorithm for 2SAT described in Notes 11, slides 8.9,10 (see also `https://www.iitg.ac.in/deepkesh/CS301/assignment-2/2sat.pdf`) to detremine if the following two instances are satisfiable or not:

$$\phi_1 = (\neg x_1 \vee x_2) \wedge (\neg x_2 \vee x_3) \wedge (\neg x_3 \vee \neg x_2) \wedge (x_1 \vee \neg x_3) \wedge (x_1 \vee x_3)$$

$$\phi_2 = (\neg x_1 \vee x_2) \wedge (x_2 \vee x_3) \wedge (\neg x_3 \vee \neg x_2) \wedge (x_1 \vee \neg x_3) \wedge (x_1 \vee x_3)$$

Answer: