

Homework #1

CS 317 Data Management and Information Processing (Spring'04)

Instructor Goce Trajcevski

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DUE: Thursday, April 15, beginning of the class

Your homework consists of two parts:

Part 1. (40 pts.) You were told that you will have a unique ID for the purposes of this class. The first part of this homework is actually generating your personal ID and you will do it by executing the steps as specified in:

<http://www.cs.northwestern.edu/~blin/317s04/317s04.html>

Essentially, you will download the files needed and store them in a separate folder, say, `class317`. Subsequently, you will have to follow the instructions as specified in the file called `README.txt`

Part 2. (60 pts.) For this part of your homework, you will have to solve the following problems listed below:

Prob. 1. Define the concept of *equivalent formulas* in propositional logic (i.e. when can one say that two formulas are *equivalent*).

Prob. 2. Is the following formula a *tautology* (justify your answer):

$$(p \text{ AND } (p \Rightarrow q)) \Rightarrow q$$

Prob. 3. Convert the following numbers (the subscript indicates the respective *base*):

$$359_{10} = ?_3$$

$$2653_7 = ?_{10}$$

$$2413124_5 = ?_{10}$$

$$7369_{10} = ?_8$$

$$3352_6 = ?_{10}$$

$$3926_{10} = ?_2$$

Prob. 4. Execute the following additions using *binary* representation of the numbers:

$$17 + 35;$$

$$296 + 44 ;$$

$$1462 + 312;$$

$$513 + 893;$$

Prob. 5. In your own free interpretation, write a statement(s) that would best describe the steps involved in the *multiplication* of two binary numbers.

Prob. 6. Explain briefly the notion of a *memory hierarchy*.