Assignment 3 - Software I, Spring 2003 (0368-2157-9,0368-2157-12)

`http://www.cs.tau.ac.il/~efif/courses/software1`

Due: April 8, 2003

Before starting to answer the questions, please read very carefully the "Submission Guidelines" [1]. Make sure your programs detect invalid input data, and print out appropriate error messages. Do not add "friendly" messages to your programs, as they are tested automatically by other programs.

Exercise 3.3, namely longbin2dec, is optional. If you don't provide a correct solution, your grade will not be harmed. However, if you do provide a correct solution, you will get a bonus, that will be weighted into your overall assignments grade.

Ex 3.1   hanoi

The towers of Hanoi legend tells a story about a great temple at Benares with 3 golden spikes. On one of them, God placed 64 disks increasing in size from bottom to top, at the beginning of time. Since then, and to this day, the priest on duty constantly transfers disks, one at a time, in such a way that no larger disk is ever put on top of a smaller one. When the disks have been transferred entirely to another spike the Universe will come to an end in a large thunderclap.

Write a program that simulates the operations required to bring the universe to an end. The program reads the initial number of disks on the first tower, and prints out the minimum number of operations required to move the disks to another tower.

For example, 15 operations are required to move a stack of 4 disks from one tower to the second.

Ex 3.2   bin2dec

Write a program that reads a string of at most 32 '0's and '1's, interprets it as a binary number, and prints the number in base 10 format.
For example:

```
bin2dec
1010
10
```

Ex 3.3   longbin2dec

Optional
Write a program that reads an arbitrarily long string of '0's and '1's, interprets it as a binary number,

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[1]`http://www.cs.tau.ac.il/~efif/courses/software1`

and prints the number in base 10 format. For this exercise, you may assume that the string is at most 1000 characters (binary digits) long. Make sure to provide sufficient in-line documentation (comments).

Good Luck!

More Information on the Submission

Files Name

The files for the exercises should be located under `~/software1/assign3`, and their names should match the name of the exercise. For example, the `C` source file and corresponding executable for exercise 3.1, namely hanoi, should be `~/software1/assign3/hanoi.c` and `~/software1/assign3/hanoi` respectively. Note that names are case sensitive (i.e. `ex1.C` is different than `ex1.c`).

Giving Permission to the Files

Before submitting the solution set, please give permission to the files by executing the following command:

```
chmod 705 ~ ~/software1 ~/software1/assign3 ~/software1/assign3/*
```