

**Lab #1**  
**Installing a System**  
**Due Friday, September 6, 2002**

Name: \_\_\_\_\_

Lab Time: \_\_\_\_\_

Grade: \_\_\_\_\_/10

**The Steps of Installing a System**

Today you will install a software package. Implementing a software system is only part of a software engineer's job. Once implemented, a system needs to be installed. A software engineer needs to design the installation process, also called deployment, to make it as easy as possible for the system's users to obtain and install the system.

As you install this lab's example program, think about what you like and dislike about the process. What aspects can be improved and how? The steps to install a Unix program typically involve:

- a. Finding
- b. Getting
- c. Unpacking
- d. Localizing
- e. Building
- f. Installing
- g. Sanity Testing

**Finding and Getting**

For this lab we will be installing a program called `gnuchess`. It is a chess program created by the GNU software project. A copy of the distribution for `gnuchess` can be found at the location below. Copy this file into your `tmp` directory.

```
~/csci3308/src/chess-5.02.tar.gz
```

## Unpacking

The gnu chess distribution was “packed” with a program called “tar”, and then compressed with a program called “gzip.” In order to “unpack” the distribution, you will have to undo these steps in the reverse order. You will first decompress the distribution with gzip and then unpack it with tar. However, first we will review the tar command.

The tar command takes the form

```
tar c|r|u|x|t[option...] [file...]
```

This line is in the standard format for man pages. The vertical bar means exclusive or. That is, the word tar must be followed by one *and only one* of **c**, **r**, **u**, **x**, or **t**. The square brackets mean optional, and the ellipsis means repetition. So the first letter can be optionally followed by zero or more options and zero or more files. Also notice that there is no space between the first letter and the options, but there is a space between the options and the files. The following are examples of tar commands.

```
tar x
tar cv file1 file2
```

So now you know the syntax of tar commands, but what do they do? What tar does depends on the first letter.

- c** Create. Tar creates a tar file containing the files listed on the command line. If a directory is listed all of its files and subdirectories are included as well.
- r** Replace. Similar to create, it adds files to an existing tar file
- u** Update. Similar to replace, except a file is only stored in the archive if it has a timestamp that is more recent than the existing copy stored in the archive.
- x** Extract. Extracts from the tar file the files listed on the command line. If no files are listed it extracts the entire tar file.
- t** Table of contents. Similar to extract except that tar only lists the names of the files that would be extracted if **x** were used, but performs no extraction.

Another important question is which tar file does tar use? The tar file is specified by the option `f` followed by the name of the tar file. Notice that this is an optional argument. `tar` stands for tape archive. It was originally intended to be used with a tape drive. If no `f` option is given tar assumes you want to read or write a tape drive. This usually results in tar reporting that it can't find the device file for the tape drive, or on some versions tar will sit quietly and wait for the drive to become available, and you will wait thinking tar is doing something when it is not. Because the `f` option is so important I will rewrite the tar description this way.

```
tar c|r|u|x|t[option...][f tarfile] [file...]
```

The only other option that I will tell you about is the `v` option that stands for verbose. With verbose, tar prints more information than it would otherwise. Most other options deal with the characteristics of tape drives.

1. Change to your `tmp` directory where you copied the distribution.
2. To uncompress the gzipped file type

```
gunzip chess-5.02.tar.gz
```

The command `gzip -d chess-5.02.tar.gz` will also work. The `-d` flag stands for decompress. There is more than one way to skin a cat...especially in Unix! The distribution file is now just a tar file: `chess-5.02.tar`.

3. Before you unpack the tar file you want to know what is in it. Type:

```
tar tvf chess-5.02.tar
```

4. Describe the parts of this tar command.

5. This tar file is a source distribution. That is, it contains only source code. As such, it needs to be unpacked into your source directory (`src.`) When you unpack this distribution you want it to go in its own directory under your source directory. Fortunately, the tar file was packaged so that it would create a new directory and place all of the files in that directory. Go into your source directory and unpack the distribution with the command: