CS 404: Lab 1: Finding Libraries

Getting Started

1. If you don't already have an ACCEL account, follow the directions to create one.

2. Boot into Linux. To do this, click on "shutdown" and then select "restart." The computer will begin restarting. You will eventually have the option to select either Win2K or Linux (use up and down arrows to switch, press enter to select).

Surfing for Applied Scientific Computing

1. Launch Netscape (type netscape & in a terminal window or click on the "K" menu at the lower left–Netscape is in the "Internet" folder). Go to www.netlib.org. Netlib contains lots of libraries for scientific computing. Clicking on "Browse" will bring up a list of libraries. For more info, click on the "more descriptive version" link. This gives a brief description of each of the libraries. Click on the link to the CLAPACK library. This is a C-version of LAPACK. What kinds of files are there? Check out some other libraries. What languages do you find? How uniform are the packages in terms of documentation and archive-file types (.zip, .tar, etc.)?

2. To search Netlib, go back to the home page and click on "search." Try finding a Java implementation of LAPACK.

3. Netlib's claim to fame is its collection of numerical software; however, Netlib contains a few other interesting things, including a list of conferences related to numerical computing and list of the Top 500 supercomputers. According to this ranking, Cornell's Velocity is the 320th computer in the world. (To see the most current list, click on the "Top500 Supercomputer Sites," then click on www.top500.org, then on current list, and finally on "Top500 list in HTML").

4. Now, check out GAMS: gams.nist.gov. GAMS organizes packages based on the problems the solve. To see how GAMS is organized, click on the "problem decision tree" link. Click on the class of mathematical

problem most closely related to your research interests. What do you find? Typically, a class will contain several subclasses and possibly some packages. Keep descending through the tree until you find an interesting package. Can you get the code? How about documentation?

5. There is also an interface for searching GAMS. Go back to the GAMS homepage and click on HotGAMS. This will bring up a description page. You can use HotGAMS with and without frames–I prefer the unframed version, but it's your call. To search GAMS, click on the "Search" tab at the top. You can then choose what level of information you're looking for: classes (levels in the GAMS decision tree), packages (like BLAS, LAPACK–not implemented, yet!), or modules (routines within packages). Try to find routines to solve a sparse system of linear equations (I searched "sparse linear system"). Although package searching is not available, module searches sort the results by packages. For sparse linear systems, two of the big packages seem to be IMSLM and ITPACK. What is the big difference between these packages?

6. Last but not least, use Google to try to find software for your particular field. Happy hunting!