Systems Programming 1 – 300167

Tutorial and Lab Practice Five (follows Lecture Five).

This work **will** be marked and is due in your scheduled lab class the week commencing Monday 18th of April, and is worth **4%** of your assessment. You should hand in a hard copy of your answers and demonstrate your programs to you Tutor during your scheduled lab session.
Email submission is not accepted.

Tutorial

1. Read chapter three and four of the textbook.
2. Review the terminology introduced and concepts taught in Lecture Five.
3. A file has name and content, what other attributes does a file have?
4. What information does `stat` provide?
5. How does masking work? Why do we need masking?
6. What kind of structure does a file system have? How is an inode related to a file?
7. Draw a picture with 9 little boxes and fill in the 1s and 0s for the mode for a file with permission modes of
   r - x r w x - - x
   r w x r - - - - -
   r w x - - - - - -
   r w - r - - r - -
   r w - r w - r - -
   (**1%**)
8. write a single Unix command line that builds the entire tree of directories. The tree's 1st level has a directory *a* which has two subdirectories *b* and *c*. *b* has three subdirectories *d, e*, and *f*, and *c* has two subdirectories *g* and *h*. (Hint: review the mkdir command.)(**1%**)

Lab Practice

1. The standard *cp* utility allows the second argument to be a directory name. In that situation, the file is copied to a file with the same name under the named directory. Modify *cp1.c* to behave this way. (Hint: The POSIX macro *S _ ISDIR(m)* is defined to check if the file type is a directory using the st_mode field *m*. The c function *strrchr* is defined to return a pointer to the last occurrence of a character in string or a null pointer if no matching character is found.) (**2%**)

Optional Work **(For those students who wish to practise more.)**

1. Recursive *ls* Standard *ls* supports the -*R* option which lists the contents of a directory and the contents of of all directories below it. Write a program to support this option.