Midterm #2 Programming Test (10%)

CS5432 Advanced UNIX Programming, Instructor: Cheng-Hsin Hsu

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6:00 p.m., Dec. 7th – 6:00 a.m., Dec. 8th, 2023

- **Please use the C language for your answers (C++ is not allowed).**
- **You are allowed to search online for tips, but NOT allowed to use ChatGPT.**
- **You are not allowed to copy and paste source code from the Internet.**
- **Please submit your source codes named *q1.c, q2.c, q3.c, q4.c*, a single *Makefile* that can compile all your source codes simultaneously, and a *report* that describes how to run your code for each question to eeclass.**
- **You may assume that all the inputs are quite normal and do not need to handle exceptions.**
- **You should ensure that all your outputs are identical to the outputs in FreeBSD.**

1) (2.5%) Write a program that calls sleep(10) in an infinite loop. Every six times through the loop (every minute), fetch the current time of day and print the tm_sec field. Run the program for 3+ hours and explain the results. How would a program such as the cron daemon, which runs every minute on the minute, handle this situation? Please answer the question and write your observations in the report.

2) (2.5%) Write a program to find all the symbolic links under a given path, and print the content of the symbolic links (actual pathnames). You may assume the pathnames are no longer than 512 bytes.

3) (2.5%) Write a utility to print the current time in the following format: "Hour:Min:Sec, Week day Month Date, Year" (24-hour format, full month name). For example, 10:35:03, Tuesday November 29, 2016.

4) (2.5%) A sample code (program.c) converts an integer array into a link list and sort the given list in the ascending order. However, there are some bugs in the source code (program.c), please fix

the bugs and write your implementation in the report. Your submitted q4.c shall produce correct answers, without any compilation/run-time errors and warning, including memory leaks. Notice that you can not add new functions nor change the signature (say parameters) of existing functions.