Department of Computing Sciences

CSCI 356 — Operating Systems
Homework Assignment #2-

Due: Thursday, September 14, 2017

Name: ID:

In problems 1 and 2 of this assignment, you will write a few C programs to familiarize yourself with C types, idioms, and libraries.

1. Write a program (`cp.c`) that implements the UNIX command `cp`. Your program will take two filenames as command-line arguments and your program should copy the contents of the first file to the second.
    For example, `cp /home/user/schedule.txt  /tmp/s.txt` should copy `/home/user/schedule.txt` to `/tmp/s.txt`. If `/tmp/s.txt` already exists, your program should delete it.

    You should check the return values of all library functions and terminate your program if the source file doesn't exist, the user doesn't have sufficient privileges to write to the destination file, etc. If an error occurs, report it to the user and exit your program abnormally. See `man 3 exit` for more information.

2. Implement a sorting algorithm (`sort.c`). Write a program that prompts a user to enter a number and some text. The number must be the length of the text. Remove all whitespaces and punctuation from the text, convert all the letters to lowercase, and then sort it.

    For example: `$ wordsort`

```
Length: 16
Text:  Hello World!
dehllloorw
```

3. Are systems calls required at the kernel level or at the user level? How does the kernel handle the syscall?

4. Illustrate <u>graphically</u> the difference between the monolithic and microkernel based operating systems.

5. Explain the difference between OS tasks and OS roles.