Computer Networks, Fall 2020
Instructor: Jitendra Bhatia

Lab 1: C Revision

Due: At the end of lab

In this lab, you will implement three programs in C. This lab is to be done individually.

1. Command line arguments – 30%

Please understand the code and complete the assignment as stated in the skeleton code.

```
/*
   1. Understand the following code.
   2. Print a character n times where the character and n are
      passed as command-line arguments.
*/

#include <stdio.h>
#include <stdlib.h>
#include <unistd.h>

void usage(void);

int main (int argc, char **argv){
  int num = 2;
  char disp = '*';
  char c;

  while ((c = getopt (argc, argv, "n:d:")) != -1)

    switch (c){

    case 'n':
      num = atoi(optarg);
      break;

    case 'd':
        disp = optarg[0];
        break;

    default:
```

```
      usage();
      exit (1);
      }

  printf ("number = %d, display char = %c\n",
          num, disp);
  /*
  for (...)
    printf (...);
  */
  return 0;
}

void usage(void){

  printf("Usage:\n");
  printf(" -n <repetitions>\n");
  printf(" -d <char to dispaly>\n");
  exit (8);
}
```

2. File input and output – 30%

The following code reads from a file one character at a time.

```
#include <stdio.h>
#include <stdlib.h>

int main(){

        /* Pointer to the source file */
        FILE *src;

        /* File is read one character at a time*/
        char c;

        /* Opening source file in read mode*/
        src = fopen ("sample.txt", "r");
        if( src == NULL ){
        printf("File not found. Exiting.\n");
        exit(EXIT_FAILURE);
        }

        /* Read src until end-of-file char is encountered */
        while( (c = fgetc(src)) != EOF ){
        printf("%c", c);
        }

        fclose(src);
        return 0;
        }
}
```

Understand, compile and run the code. You can create your own file for testing or download the sample.txt file.

- ➔ Modify the code so that a user can supply the filename from command line using -i filename switch. Further, if the user does not supply the filename, your program should attempt to read sample.txt by default.

- ➔ Finally, modify the code to copy an input file to an output file. The user may supply the output filename using -o outfile switch, else output the copy to sample_out.txt by default.

3 Process creation - 40%

Write a program that when executed creates two child processes using fork() system call where one child process prints date and the other does the tracing of route to google dns server. Further, all three processes print their PID and identify themselves as parent, child 1 and child 2 prior to printing anything else.

4 Submission instruction

Show your work to TAs