University of Southern
Maine

M. FENTON LIBBY
COS 350
17 MARCH 2021

Program 3 Write-Up

Systems Programming

Summa

On Honeybee, the following code was written:

```
#include <stdlib.h>
#include <stdio.h>
#include <errno.h>
#include <string.h>
#include <dirent.h>
#include <pwd.h>
#include <sys/stat.h>
#include <unistd.h>
#include <time.h>
#include <fcntl.h>

int requestString(char* request, char* inputBuffer);
int listfiles(char* files, char* dir);
void printFileProperties(struct stat stats);
int showFiles(char* dir, struct stat input);
int copyFile(char* fileName, char* targetDir);

#define CLASS_BIT 1
#define NAME_BIT 2
#define FILE_BIT 4
#define CBUFF_SIZE 8
char classBuf[CBUFF_SIZE];
char dirBuf[500];
char nameBuf[500];
char fileBuf[500];
char* cpBuf;
char* buff;
char dummyBuf[100];
int sByte = 0;

int main(int argc, char** argv){
  struct passwd userCredin;
  struct passwd* userCredout;
  struct stat input;
  struct dirent ***namelist;
  uid_t user = getuid();


  //collect user info:
  getpwuid_r(user, &userCredin, dummyBuf, 100, &userCredout);

  //ensure class folder exists, query again if not:
  strcat(dirBuf, "class/");
  while(!(sByte & CLASS_BIT)){
    requestString("Please enter class number (e.g.\"COS350\"):", classBuf);
    strcat(dirBuf, classBuf);
    if (stat(dirBuf, &input) == 0){
      sByte |= CLASS_BIT;
      //break;
    } else {
```

```
    dirBuf[8] = 0;
  }
  // printf("Full dir: %s\n", dirBuf );
}

strcat(dirBuf, "/submit");

//verify that submit exists
if(stat(dirBuf, &input) != 0){
  printf("This class is not currently accepting submissions.\n");
  exit(1);
}
strcat(dirBuf, "/");

//get username
strcat(dirBuf, userCredin.pw_name);
//check if user folder exists in specified dir, if not create it

if(stat(dirBuf, &input) != 0){
  //create user director inside specified submit folder
  mkdir(dirBuf, S_IRWXU | S_IRWXG | S_IROTH | S_IXOTH);
}

strcat(dirBuf, "/");
//query for assignment name, create directory if it doesn't already exist
while(!(sByte & NAME_BIT)){
  requestString("Please enter assignment name (e.g.\"prog1\"):", nameBuf);
  strcat(dirBuf, nameBuf);
  if (stat(dirBuf, &input) == 0){
    sByte |= NAME_BIT;
  } else {
    mkdir(dirBuf, S_IRWXU | S_IRWXG | S_IROTH | S_IXOTH);
    sByte |= NAME_BIT;
  }
  printf("Full dir: %s\n", dirBuf );
}


showFiles(".", input);

//get list of files to submit
requestString("Which files do you want to submit (use spaces to separate files): ",
    fileBuf);
//allow for submitting *
if (fileBuf[0] == '*'){
  fileBuf[0] = 0;
  listfiles(fileBuf, ".");
}
printf("Files: %s\n", fileBuf);
cpBuf = (char*) malloc(100);
cpBuf = strtok(fileBuf, " ");
while(cpBuf != NULL){
  printf("Copying %s\n", cpBuf);
  copyFile(cpBuf, dirBuf);
  cpBuf = strtok(NULL, " ");
}
printf("\n");

//show files in submission directory
```

```
  showFiles(dirBuf, input);
}


int requestString(char* request, char* inputBuffer){
  int c, i = 0;
  printf("%s", request);
  while((c = getchar()) != EOF & c != '\n'){
    inputBuffer[i++] = c;
  }
  classBuf[i] = 0;
  putchar('\n');
}


int copyFile(char* fileName, char* targetDir){
  char tarTemp[500] = "";
  strcat(tarTemp, targetDir);
  strcat(tarTemp, "/");
  strcat(tarTemp, fileName);
  FILE* source;
  source = fopen(fileName, "r");
  FILE* target;
  target = fopen(tarTemp, "w+");
  char buff;
  while ( fread(&buff, 1, 1, source)!= 0){
    fwrite(&buff, 1, 1, target);
  }
  fclose(source);
  fclose(target);
}

int listfiles(char* files, char* dir){

  struct dirent **namelist;
  int n;
  int j = 0;
  if ((n = scandir(dir, &namelist, NULL, alphasort)) == -1){
    fprintf(stderr, "Failed to query directory '%s' for file list\n", dir);
    return(1);
  }
  while (j < n){
    if ((namelist[j]->d_name)[0]!='.'){
      strcat(files, namelist[j]->d_name);
      if (j != n-1){
    strcat(files, " ");
      }
    }
    j++;
  }
  printf("\n");

}

int showFiles(char* dir, struct stat input){
  struct dirent **namelist;
  struct tm dt;
  int n;
  int j = 0;
```

```
  if ((n = scandir(dir, &namelist, NULL, alphasort)) == -1){
    fprintf(stderr, "Failed to query directory '%s' for file list\n", dir);
    return(1);
  }
  printf("\n-File-\t\t-Size-\t-Last Mod-\n");
  while (j < n){
    if ((namelist[j]->d_name)[0]!='.'){
      printf("%-15s", namelist[j]->d_name);
      stat(namelist[j]->d_name, &input);
      dt = *(gmtime(&input.st_mtime));
      printf("%ld\t", input.st_size);
      printf("%d-%d-%d %d:%d:%d\n", dt.tm_mday, dt.tm_mon+1, dt.tm_year +
          1900,dt.tm_hour, dt.tm_min, dt.tm_sec);

    }
    j++;
  }
  printf("\n");
}
```

Makefile:

```
build: mysubmit.c
   gcc mysubmit.c -o mysubmit
```

A log of the required testing results:

```
Script started on 2021-03-17 13:22:17-0400
mflibby@honeybee:~/cos350/prog/prog3$ mkdir class/cos101
mflibby@honeybee:~/cos350/prog/prog3$ mkdir class/cos101/submit
mflibby@honeybee:~/cos350/prog/prog3$ mysubmit
Please enter class number (e.g."COS350"):cos101

Please enter assignment name (e.g."prog1"):prog1

Full dir: class/cos101/submit/mflibby/prog1

-File-         -Size- -Last Mod-
Makefile      46      17-3-2021 16:26:36
Makefile~     0       17-3-2021 16:24:1
class         4096    17-3-2021 17:22:33
mysubmit      13760   17-3-2021 17:20:25
mysubmit.c    4505    17-3-2021 17:20:18
mysubmit.c~   4505    17-3-2021 17:7:26
results       0       17-3-2021 17:22:17
sub           13808   17-3-2021 16:16:6
test1         7       17-3-2021 9:11:3
test1~        0       17-3-2021 9:10:50
test2         12      17-3-2021 9:11:15
test2~        0       17-3-2021 9:10:52
testdir       4096    17-3-2021 0:47:30

Which files do you want to submit (use spaces to separate files): mysubmit.c mysubmit
    Makefile

Files: mysubmit.c mysubmit Makefile
Copying mysubmit.c
Copying mysubmit
Copying Makefile


-File-         -Size- -Last Mod-
Makefile      46      17-3-2021 16:26:36
mysubmit      13760   17-3-2021 17:20:25
mysubmit.c    4505    17-3-2021 17:20:18

mflibby@honeybee:~/cos350/prog/prog3$ ls -lR class/cos101
class/cos101:
total 4
drwx------ 3 mflibby mflibby 4096 Mar 17 13:22 submit

class/cos101/submit:
total 4
drwx------ 3 mflibby mflibby 4096 Mar 17 13:22 mflibby

class/cos101/submit/mflibby:
total 4
drwx------ 2 mflibby mflibby 4096 Mar 17 13:23 prog1

class/cos101/submit/mflibby/prog1:
total 28
-rw------- 1 mflibby mflibby 46 Mar 17 13:23 Makefile
-rw------- 1 mflibby mflibby 13760 Mar 17 13:23 mysubmit
-rw------- 1 mflibby mflibby 4505 Mar 17 13:23 mysubmit.c
```

```
mflibby@honeybee:~/cos350/prog/prog3$ mkdir class/cos102
mflibby@honeybee:~/cos350/prog/prog3$ mkdir class/cos102/submit
mflibby@honeybee:~/cos350/prog/prog3$ mysubmit
Please enter class number (e.g."COS350"):cos102

Please enter assignment name (e.g."prog1"):prog1

Full dir: class/cos102/submit/mflibby/prog1

-File-         -Size- -Last Mod-
Makefile      46      17-3-2021 16:26:36
Makefile~     0       17-3-2021 16:24:1
class         4096    17-3-2021 17:24:22
mysubmit      13760   17-3-2021 17:20:25
mysubmit.c    4505    17-3-2021 17:20:18
mysubmit.c~   4505    17-3-2021 17:7:26
results       0       17-3-2021 17:22:17
sub           13808   17-3-2021 16:16:6
test1         7       17-3-2021 9:11:3
test1~        0       17-3-2021 9:10:50
test2         12      17-3-2021 9:11:15
test2~        0       17-3-2021 9:10:52
testdir       4096    17-3-2021 0:47:30

Which files do you want to submit (use spaces to separate files): *


Files: Makefile Makefile~ class mysubmit mysubmit.c mysubmit.c~ results sub test1 test1~
    test2 test2~ testdir
Copying Makefile
Copying Makefile~
Copying class
Copying mysubmit
Copying mysubmit.c
Copying mysubmit.c~
Copying results
Copying sub
Copying test1
Copying test1~
Copying test2
Copying test2~
Copying testdir


-File-         -Size- -Last Mod-
Makefile      46      17-3-2021 16:26:36
Makefile~     0       17-3-2021 16:24:1
class         4096    17-3-2021 17:24:22
mysubmit      13760   17-3-2021 17:20:25
mysubmit.c    4505    17-3-2021 17:20:18
mysubmit.c~   4505    17-3-2021 17:7:26
results       0       17-3-2021 17:22:17
sub           13808   17-3-2021 16:16:6
test1         7       17-3-2021 9:11:3
test1~        0       17-3-2021 9:10:50
test2         12      17-3-2021 9:11:15
test2~        0       17-3-2021 9:10:52
testdir       4096    17-3-2021 0:47:30
```

```
mflibby@honeybee:~/cos350/prog/prog3$ mysubmit
Please enter class number (e.g."COS350"):cos103

Please enter class number (e.g."COS350"):cos106

Please enter class number (e.g."COS350"):asdf

Please enter class number (e.g."COS350"):^C
mflibby@honeybee:~/cos350/prog/prog3$ exit
exit

Script done on 2021-03-17 13:27:04-0400
```
