FR. CONCEICAO RODRIGUES COLLEGE OF ENGINEERING
Department of Electronics and Computer Science

9. To write C program to implement Unix functions

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Sign here to indicate that you have read all relevant material provided /available on Moodle while performing and writing this experiment		**Sign:**	

Late Submission Details (if any)

Reason(s) of late submission	**Date of practical performance**	**Date of practical submission**

References used

1	Name and author of reference book(s) with page nos.	
2	Name and roll nos. of the peers whose help you have taken (if any)	

Rubrics for assessment of Experiment:

Indicator	Poor	Average	Good
Timeliness Maintains Experiment deadline (3)	Experiment not done (0)	One or More than One week late (1-2)	Maintains deadline (3)
Completeness and neatness Complete all parts of Experiment (3)	N/A	< 80% complete (1-2)	100% complete (3)
Originality Extent of plagiarism (2)	Copied it from someone else (0)	At least try to implement but could not succeed (1)	Implemented (2)
Knowledge In depth knowledge of the Experiment (2)	Unable to answer any questions (0)	Unable to answer few questions (1)	Able to answer all questions (2)

Assessment Marks:

Timeliness	
Completeness and neatness	
Originality	
Knowledge	
Total	

Signature of Teacher with date

1. Course, Subject & Experiment Details

Course & Branch	**T.E. (ECS)**	**Estimated Time**	**02 Hours Per Week**
Current Semester	**Semester VI**	**Subject Name**	**Linux Server Administration**
Chapter No. & Unit	**2.1**	**Chapter Title**	**Unix commands**
Experiment Type	**Software Performance**	**Subject Code**	**ECL 604**

2. Aim & Objective of Experiment

1. **To implement Unix functions using C programming**

3. Expected Outcome of Experiment

1. **To convert Unix commands into C program**

4. Brief Description of the experiment

1. Write a C program to implement the following Unix commands:
   Cat, cp, mv
   (Write algorithm and code for the given question)

   CAT:

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

#define BUFFER_SIZE 50

int main(int argc, char **argv)
{
  int   file;
  char  buffer[BUFFER_SIZE];
  int   read_size;

  if (argc < 2)
    {
      fprintf(stderr, "Error: usage: ./cat filename\n");
      return (-1);
    }
  file = open(argv[1], O_RDONLY);
  if (file == -1)
    {
      fprintf(stderr, "Error: %s: file not found\n", argv[1]);
      return (-1);
    }
  while ((read_size = read(file, buffer, BUFFER_SIZE)) > 0)
    write(1, &buffer, read_size);

  close(file);
  return (0);
}
```

```
universe@lenovo3:~/Desktop/9420_exp9$ touch cat.c
universe@lenovo3:~/Desktop/9420_exp9$ gcc cat.c -o cat
universe@lenovo3:~/Desktop/9420_exp9$ touch cat,txt
universe@lenovo3:~/Desktop/9420_exp9$ touch cat.txt
universe@lenovo3:~/Desktop/9420_exp9$ ./cat cat.txt
Hello, I am Vrushti Shah from TE ECS
```

2. Write a C program to redirect output of Unix command “ls -l” in some other file

```
#include <stdio.h>
#include <unistd.h>
#include <sys/types.h>
#include <sys/wait.h>
#include <stdlib.h>
int main()
{
int pid;          //process id
pid = fork();     //create another process
if ( pid < 0 )
{                          //fail
printf("\nFork failed\n");
exit (-1);
}
else if ( pid == 0 )
{                 //child
execlp ( "/bin/ls", "ls", "-l", NULL );  //execute ls
}
else
{                        //parent
wait (NULL);             //wait for child
printf("\nchild complete\n");
exit (0);
}
```

```
found the file move.txtuniverse@lenovo3:~/Desktop/9420_exp9$ touch ls.c
universe@lenovo3:~/Desktop/9420_exp9$ gcc ls.c -o ls
universe@lenovo3:~/Desktop/9420_exp9$ ./ls > cat.txt
universe@lenovo3:~/Desktop/9420_exp9$ cat cat.txt
total 100
-rwxrwxr-x 1 universe universe 16992 Apr 12 19:51 cat
-rw-rw-r-- 1 universe universe   576 Apr 12 19:51 cat.c
-rw-rw-r-- 1 universe universe     0 Apr 12 19:53 cat,txt
-rw-rw-r-- 1 universe universe     0 Apr 12 20:06 cat.txt
-rwxrwxr-x 1 universe universe 16872 Apr 12 20:00 cp
-rw-rw-r-- 1 universe universe   614 Apr 12 19:59 cp.c
-rwxrwxrwx 1 universe universe     0 Apr 12 19:59 cp.txt
-rwxrwxr-x 1 universe universe 16864 Apr 12 20:06 ls
-rw-rw-r-- 1 universe universe   527 Apr 12 20:05 ls.c
-rw-rw-r-- 1 universe universe    37 Apr 12 19:53 move.txt
-rwxrwxr-x 1 universe universe 17104 Apr 12 20:03 mv
-rw-rw-r-- 1 universe universe  1228 Apr 12 20:02 mv.c
-rw-rw-r-- 1 universe universe     0 Apr 12 20:02 mv.txt

child complete
universe@lenovo3:~/Desktop/9420_exp9$
```

}

cp

```
#include <stdio.h>
#include <stdlib.h>
#include <unistd.h>
#include <fcntl.h>
int main(int argc, char **argv)
{
 char buffer[1024];
 int files[2];
 ssize_t count;
 /* Check for insufficient parameters */
 if (argc < 3)
 return -1;
 files[0] = open(argv[1], O_RDONLY);
 if (files[0] == -1) /* Check if file opened */
 return -1;
 files[1] = open(argv[2], O_WRONLY | O_CREAT | S_IRUSR | S_IWUSR);
 if (files[1] == -1) /* Check if file opened (permissions problems ...) */
 {
 close(files[0]);
 return -1;
 }
 while ((count = read(files[0], buffer, sizeof(buffer))) != 0)
 write(files[1], buffer, count);
return 0;
}
```

```
universe@lenovo3:~/Desktop/9420_exp9$ touch cp.c
universe@lenovo3:~/Desktop/9420_exp9$ touch cp.txt
universe@lenovo3:~/Desktop/9420_exp9$ gcc cp.c -o cp
universe@lenovo3:~/Desktop/9420_exp9$ chmod 777 cp.txt
```

mv

```
#include <stdio.h>
#include <sys/types.h>
#include <sys/stat.h>
#include <dirent.h>
#include <unistd.h>
#include <stdlib.h>
#include <string.h>

#define SBUF 256
#define DBUF 256

   int main(int ac, char *argv[])
   {
    DIR* dir_ptr;    // the directory
    struct dirent* direntp;


    if( ac == 1 )
    {
     printf("Usage:  %s MOVE\n", argv[0] );
     exit(0);
    }


    if(ac>1 && ac<3)
    {
     printf("Error! few arguments provided " );
     exit(0);
    }

     char src_folder[SBUF];
     char dest_folder[DBUF];
     strcpy(src_folder, argv[1]);
     strcpy(dest_folder, argv[2]);


     dir_ptr = opendir("."); //open directory
     if ( dir_ptr == NULL )
     {
        perror( "." );
        exit( 1 );
     }

     while( (direntp = readdir( dir_ptr )) != NULL )
     {
        if (  strcmp(direntp->d_name, dest_folder) !=0) //search file or directory
```

```
    {
       printf("found the file %s", dest_folder);

       break;
    }else
       printf("not found");
       break;
  }
```

```
  rename(src_folder, dest_folder);
  closedir( dir_ptr );

   return 0;
}
```

```
universe@lenovo3:~/Desktop/9420_exp9$ touch mv.c
universe@lenovo3:~/Desktop/9420_exp9$ touch mv.txt
universe@lenovo3:~/Desktop/9420_exp9$ gcc mv.c -o mv
universe@lenovo3:~/Desktop/9420 exp9$ ./mv cat.txt move.txt
```

5. Conclusions & Inferences

6. Post Lab exercise

1. Write any TWO of the above programs using Java OR Python

mv.py

```
import shutil
import os

# Get the original and new file paths from the user
original_file = input("Enter the path of the file to move: ")
new_file = input("Enter the new path for the file: ")

# Check if the original file exists
if not os.path.exists(original_file):
    print(f"File {original_file} does not exist!")
else:
    # Use shutil.move to move the file
    shutil.move(original_file, new_file)
    print(f"{original_file} has been moved to {new_file}")
```

```
universe@lenovo3:~/Desktop/9420_exp9$ python3 mv.py
Enter the path of the file to move: /home/universe/Desktop/9420_exp9
Enter the new path for the file: /home/universe/Desktop/9420_exp9
/home/universe/Desktop/9420_exp9 has been moved to /home/universe/Desktop/9420_e
xp9
universe@lenovo3:~/Desktop/9420_exp9$
```

cat.py

```
import os

# Get the path of the file to read from the user
file_path = input("Enter the path of the file to read: ")

# Check if the file exists
if not os.path.exists(file_path):
    print(f"File {file_path} does not exist!")
else:
    # Open the file and read its contents
    with open(file_path, "r") as file:
        contents = file.read()
        print(contents)
```

```
universe@lenovo3:~/Desktop/9420_exp9$ python3 cat.py
python3: can't open file 'cat.py': [Errno 2] No such file or directory
universe@lenovo3:~/Desktop/9420_exp9$ touch cat.py
universe@lenovo3:~/Desktop/9420_exp9$ python3 cat.py
Enter the path of the file to read: /home/universe/Desktop/9420_exp9/cat.txt
total 100
-rwxrwxr-x 1 universe universe 16992 Apr 12 19:51 cat
-rw-rw-r-- 1 universe universe   576 Apr 12 19:51 cat.c
-rw-rw-r-- 1 universe universe     0 Apr 12 19:53 cat,txt
-rw-rw-r-- 1 universe universe     0 Apr 12 20:06 cat.txt
-rwxrwxr-x 1 universe universe 16872 Apr 12 20:00 cp
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-rwxrwxrwx 1 universe universe     0 Apr 12 19:59 cp.txt
-rwxrwxr-x 1 universe universe 16864 Apr 12 20:06 ls
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-rw-rw-r-- 1 universe universe    37 Apr 12 19:53 move.txt
-rwxrwxr-x 1 universe universe 17104 Apr 12 20:03 mv
-rw-rw-r-- 1 universe universe  1228 Apr 12 20:02 mv.c
-rw-rw-r-- 1 universe universe     0 Apr 12 20:02 mv.txt

child complete
```