UIT2512---Operating Systems Practices Lab

4) Simulation of Linux Commands in Python

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1) ls

CODE:

```
import os

# Function : List all files, including hidden files (ls -a)
def ls_a():
    files = os.listdir('.')
    for file in files:
        print(file)

# Function: List files in a detailed format (ls -l)
def ls_l():
    files = os.listdir('.')
    for file in files:
        file_info = os.stat(file)
        print(f"File: {file}, Size: {file_info.st_size} bytes")

print("Simulating 'ls' command with option 'a':")
ls_a()

print("\nSimulating 'ls' command with option 'l':")
ls_l()
```

OUTPUT:

```
Simulating 'ls' command with option 'a':
linx.py

Simulating 'ls' command with option 'l':
File: linx.py, Size: 506 bytes
PS C:\Users\B Vasundhara\Documents\OS\Linux commands>
```

2) cat

CODE:

```
# Function: Display line numbers (cat -n)
def cat_n(filename):
    with open(filename, 'r') as file:
        lines = file.readlines()
        for i, line in enumerate(lines, start=1):
            print(f"{i}: {line.strip()}")

# Function: Display the last 'n' lines of the file (cat -tail <num_lines>)
def cat_tail(filename, num_lines):
    with open(filename, 'r') as file:
        lines = file.readlines()
        last_lines = lines[-num_lines:]
        for i, line in enumerate(last_lines, start=len(lines) - num_lines + 1):
            print(f"{i}: {line.strip()}")

print("Simulating 'cat' command with option 'tail' lines:")
cat_tail('file1.txt', 2)  # Display the last 5 lines

print()
print("Simulating 'cat' command with option 'n':")
cat_n('file1.txt')
```

OUTPUT:

```
Simulating 'cat' command with option 'tail' lines:
10: An OS provides common services for computer programs.
11: The OS is the most important type of system software in a computer system.

Simulating 'cat' command with option 'n':
1: Operating System lies in the category of system software.
2: It basically manages all the resources of the computer.
3: An OS acts as an interface between the software and different parts of the computer.
4: The OS can manage the overall resources and operations of the computer.
5:
6: OS is a fully integrated set of specialized programs.
7: It controls and monitors the execution of all other programs.
8: Examples of Operating Systems are Windows, Linux, Mac OS, etc.
9:
10: An OS provides common services for computer programs.
11: The OS is the most important type of system software in a computer system.
PS C:\Users\B Vasundhara\Documents\OS\Linux commands>
```

linx.py file1.txt

file1.txt

```
1   Operating System lies in the category of system software.
2   It basically manages all the resources of the computer.
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6   OS is a fully integrated set of specialized programs.
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9
10  An OS provides common services for computer programs.
11  The OS is the most important type of system software in a computer system.
```

3) cp

CODE:

```
import shutil

#Function: Prompt before overwrite (cp -i)
def cp_option_i(src, dest):
    shutil.copy2(src, dest)

# Function: Copy directories recursively (cp -r)
def cp_option_r(src, dest):
    shutil.copytree(src, dest)

print("Simulating 'cp' command with option 'i':")
cp_option_i('file1.txt', 'file_copy.txt')

print("Simulating 'cp' command with option 'r':")
cp_option_r('newdirectory', 'directorycopy')
```

OUTPUT:

```
\Linux commands\linx.py'
Simulating 'cp' command with option 'i':
Simulating 'cp' command with option 'r':
```

file_copy.txt

```
Operating System lies in the category of system software.
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OS is a fully integrated set of specialized programs.
It controls and monitors the execution of all other programs.
Examples of Operating Systems are Windows, Linux, Mac OS, etc.

An OS provides common services for computer programs.
The OS is the most important type of system software in a computer system.
```
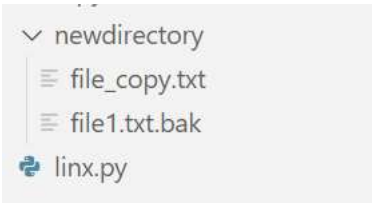

4) mv

CODE:

```
import shutil

# Option: Move only when source is newer or missing (mv -u)
def mv_option_u(src, dest):
    shutil.move(src, dest)

# Option: Make a backup of existing destination files (mv -b)
def mv_option_b(src, dest):
    shutil.move(src, f"{dest}.bak")

print("Simulating 'mv' command with option 'u':")
mv_option_u('file1.txt', 'newdirectory/file1.txt')

print("Simulating 'mv' command with option 'b':")
mv_option_b('file1.txt', 'newdirectory/file1.txt')
```

OUTPUT:

```
Simulating 'mv' command with option 'u':
Simulating 'mv' command with option 'b':
PS C:\Users\B Vasundhara\Documents\OS\Linux commands>
```



5) grep

CODE:

```
import re

# Option: Ignore case (grep -i)
def grep_option_i(pattern, filename):
    with open(filename, 'r') as file:
        for line in file:
            if re.search(pattern, line, re.IGNORECASE):
                print(line.strip())

# Option: Count of matching lines (grep -c)
def grep_option_c(pattern, filename):
    count = 0
    with open(filename, 'r') as file:
        for line in file:
            if re.search(pattern, line):
                count += 1
    print(f"Count of lines matching the pattern: {count}")

print("Simulating 'grep' command with option 'i':")
grep_option_i('OS', 'file.txt')

print()
print("Simulating 'grep' command with option 'c':")
grep_option_c('OS', 'file.txt')
```

OUTPUT:

file.txt

```
Operating System lies in the category of system software.
It basically manages all the resources of the computer.
An OS acts as an interface between the software and different parts of the computer.
The OS can manage the overall resources and operations of the computer.

OS is a fully integrated set of specialized programs.
It controls and monitors the execution of all other programs.
Examples of Operating Systems are Windows, Linux, Mac OS, etc.

An OS provides common services for computer programs.
The OS is the most important type of system software in a computer system.
```

```
Simulating 'grep' command with option 'i':
An OS acts as an interface between the software and different parts of the computer.
The OS can manage the overall resources and operations of the computer.
OS is a fully integrated set of specialized programs.
Examples of Operating Systems are Windows, Linux, Mac OS, etc.
An OS provides common services for computer programs.
The OS is the most important type of system software in a computer system.

Simulating 'grep' command with option 'c':
Count of lines matching the pattern: 6
PS C:\Users\B Vasundhara\Documents\OS\Linux commands>
```