Amrita School of Engineering, Amritapuri Campus.
19CSE213: Operating Systems
LAB SHEET 2
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Linux:-Filters, Regular Expressions and Shell Programming

Lab Exercise

1. Create a file **demo** with the following contents

   Student Alice Essentials 20 PSAT 22 Maths 34 Cultural 25 English 70

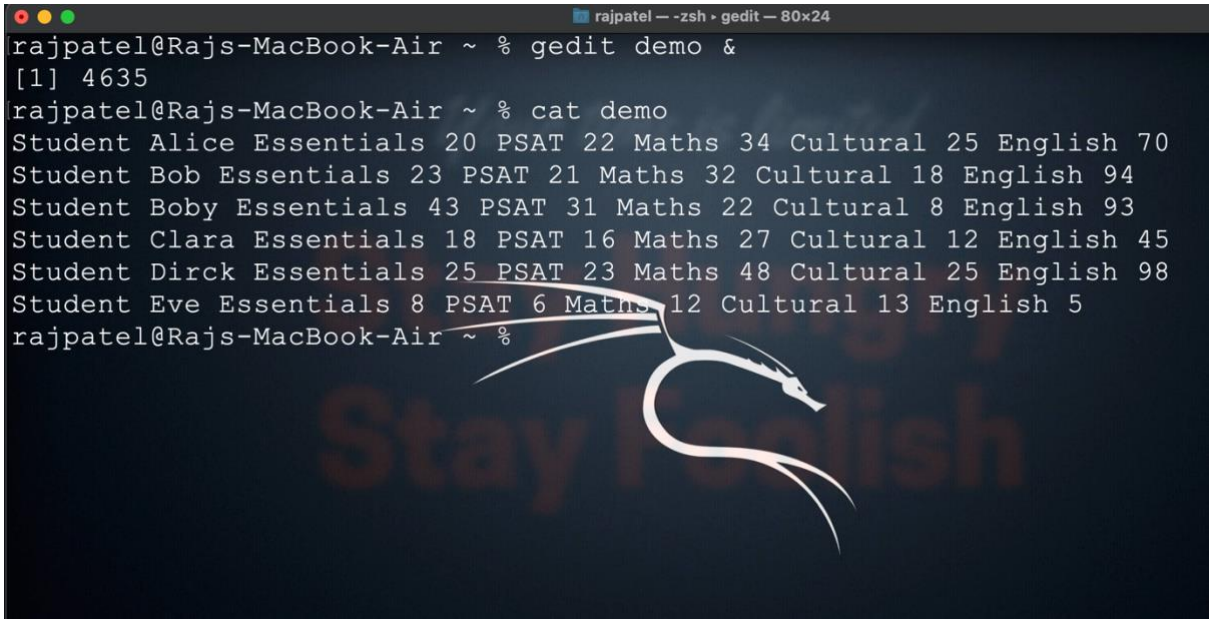
   Student Bob Essentials 23 PSAT 21 Maths 32 Cultural 18 English 94

   Student Boby Essentials 43 PSAT 31 Maths 22 Cultural 8 English 93

   Student Clara Essentials 18 PSAT 16 Maths 27 Cultural 12 English 45

   Student Dirck Essentials 25 PSAT 23 Maths 48 Cultural 25 English 98

   Student Eve Essentials 8 PSAT 6 Maths 12 Cultural 13 English 5



2. Find the marks obtained by Clara in all the subjects

3. Print the marks for essentials in the increasing order

4. Find the maximum marks scored in PSAT

5. Find the minimum marks obtained in Cultural

6. Save the marks obtained by all the students in maths into a file and display it in the terminal using a single command

7. Print the first 3 letters of all student names.

```
rajpatel@Rajs-MacBook-Air ~ % cat demo | cut -d ' ' -f 2 | cut -c 1-3
Ali
Bob
Bob
Cla
Dir
Eve
rajpatel@Rajs-MacBook-Air ~ %
```

8. Print the contents of file **demo** in terminal with all alphabets in capital letters.

```
rajpatel@Rajs-MacBook-Air ~ % cat demo | tr a-z A-Z
STUDENT ALICE ESSENTIALS 20 PSAT 22 MATHS 34 CULTURAL 25 ENGLISH 70
STUDENT BOB ESSENTIALS 23 PSAT 21 MATHS 32 CULTURAL 18 ENGLISH 94
STUDENT BOBY ESSENTIALS 43 PSAT 31 MATHS 22 CULTURAL 8 ENGLISH 93
STUDENT CLARA ESSENTIALS 18 PSAT 16 MATHS 27 CULTURAL 12 ENGLISH 45
STUDENT DIRCK ESSENTIALS 25 PSAT 23 MATHS 48 CULTURAL 25 ENGLISH 98
STUDENT EVE ESSENTIALS 8 PSAT 6 MATHS 12 CULTURAL 13 ENGLISH 5
rajpatel@Rajs-MacBook-Air ~ %
```

9. Print all student names after deleting the letter ‘a’

```
rajpatel@Rajs-MacBook-Air ~ % cat demo | tr -d a
Student Alice Essentils 20 PSAT 22 Mths 34 Culturl 25 English 70
Student Bob Essentils 23 PSAT 21 Mths 32 Culturl 18 English 94
Student Boby Essentils 43 PSAT 31 Mths 22 Culturl 8 English 93
Student Clr Essentils 18 PSAT 16 Mths 27 Culturl 12 English 45
Student Dirck Essentils 25 PSAT 23 Mths 48 Culturl 25 English 98
Student Eve Essentils 8 PSAT 6 Mths 12 Culturl 13 English 5
rajpatel@Rajs-MacBook-Air ~ %
```

10. Count the number of lines, words and characters in demo file after removing the letter ‘S’

```
rajpatel@Rajs-MacBook-Air ~ % cat demo | tr -d S | wc
       6      72     387
rajpatel@Rajs-MacBook-Air ~ %
```

11. Find the number of students with their names containing the letter a, e or i

```
rajpatel@Rajs-MacBook-Air ~ % cat demo | cut -d ' ' -f 2 |grep -E 'a|e|i' | w
       4
rajpatel@Rajs-MacBook-Air ~ %
```

12.Find the marks of students whose names starts with ‘b’ (case insensitive)

```
rajpatel@Rajs-MacBook-Air ~ % cat demo | cut -d ' ' -f 2-12 |grep ^b -i
Bob Essentials 23 PSAT 21 Maths 32 Cultural 18 English 94
Boby Essentials 43 PSAT 31 Maths 22 Cultural 8 English 93
rajpatel@Rajs-MacBook-Air ~ %
```

13.Find the names of students whose names starts with ‘b’ and ends with ‘y’ (case insensitive)

```
rajpatel@Rajs-MacBook-Air ~ % cat demo | cut -d ' ' -f 2 |grep ^b -i |grep y$
Boby
rajpatel@Rajs-MacBook-Air ~ %
```

Shell Programming

1. Write a shell program to perform the following actions in the given order.
   a. Create a directory hierarchy in your home folder

      Test1 ➡ Test2 ➡ Test3

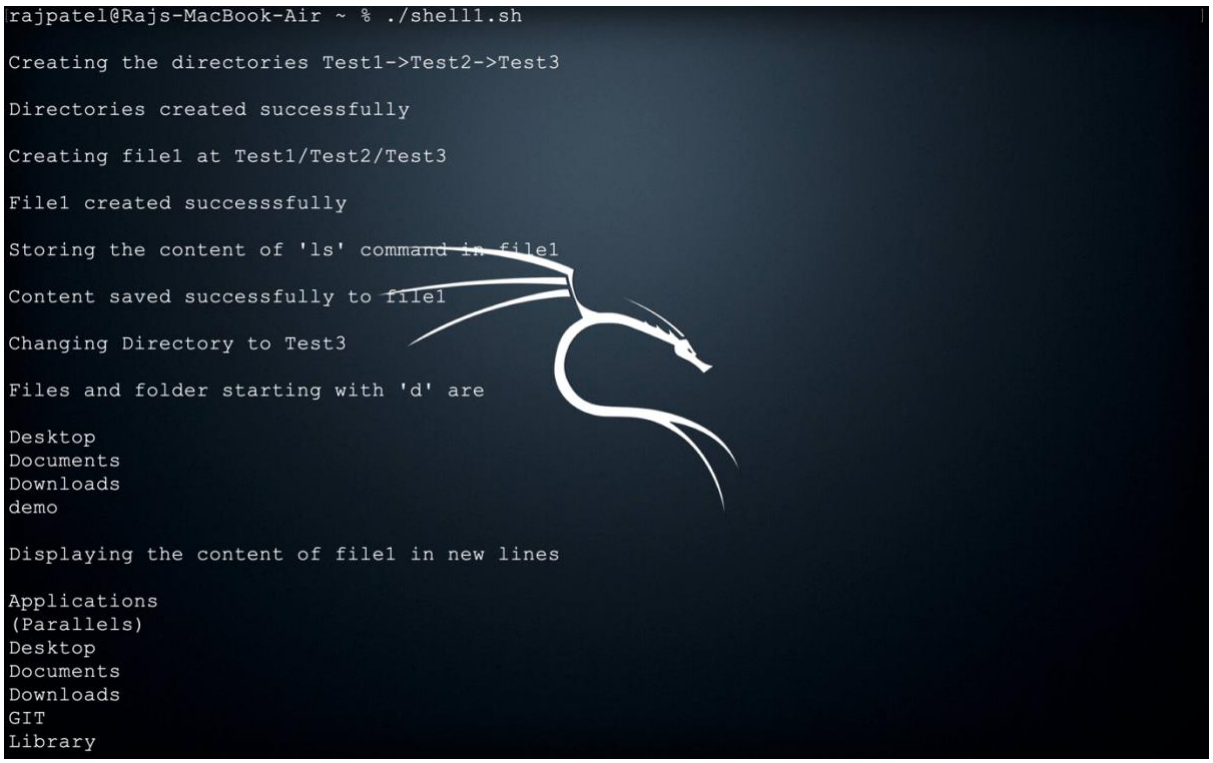
   b. Create a file file1 in directory Test3 with the contents same as output of the command ls -l
   c. Go to directory Test3
   d. Find the names of all files and folders in file1
   e. Find the names of all files and folders starting with d(case insensitive)
   f. Print all words of file1 on a separate line.
   g. Go back to your home directory.

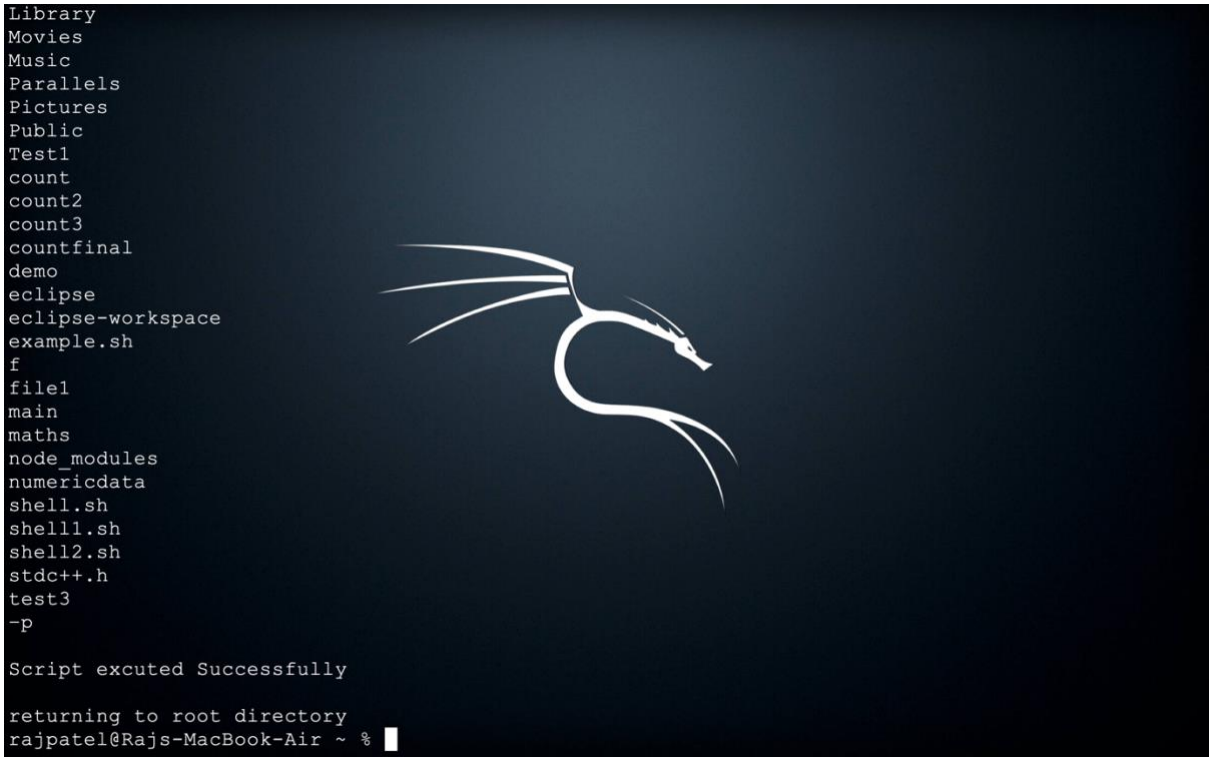
Script :

```
#!/bin/bash
echo " "
echo "Creating the directories Test1->Test2->Test3"
echo " "
mkdir -p Test1/Test2/Test3
echo "Directories created successfully"
echo " "
```

```
echo "Creating file1 at Test1/Test2/Test3"
echo " "
touch Test1/Test2/Test3/file1
echo "File1 created successsfully"
echo " "
echo "Storing the content of 'ls' command in file1 "
echo " "
ls > Test1/Test2/Test3/file1
echo "Content saved successfully to file1"
echo " "
echo "Changing Directory to Test3"
cd Test1/Test2/Test3
echo " "
echo "Files and folder starting with 'd' are "
echo " "
cat file1 | grep ^d -i
echo " "
echo "Displaying the content of file1 in new lines"
echo " "
cat file1 | tr ' ' '\n'
echo " "
echo "Script excuted Successfully"
echo " "
cd ~
echo "returning to root directory"
```

Output


rajpatel@Rajs-MacBook-Air ~ % ./shell1.sh
Creating the directories Test1->Test2->Test3
Directories created successfully
Creating file1 at Test1/Test2/Test3
File1 created successsfully
Storing the content of 'ls' command in file1
Content saved successfully to file1
Changing Directory to Test3
Files and folder starting with 'd' are
Desktop
Documents
Downloads
demo
Displaying the content of file1 in new lines
Applications
(Parallels)
Desktop
Documents
Downloads
GIT
Library



2. Write a shell program to perform the following actions in the given order.
    a. Create a file **numericdata** with the following contents

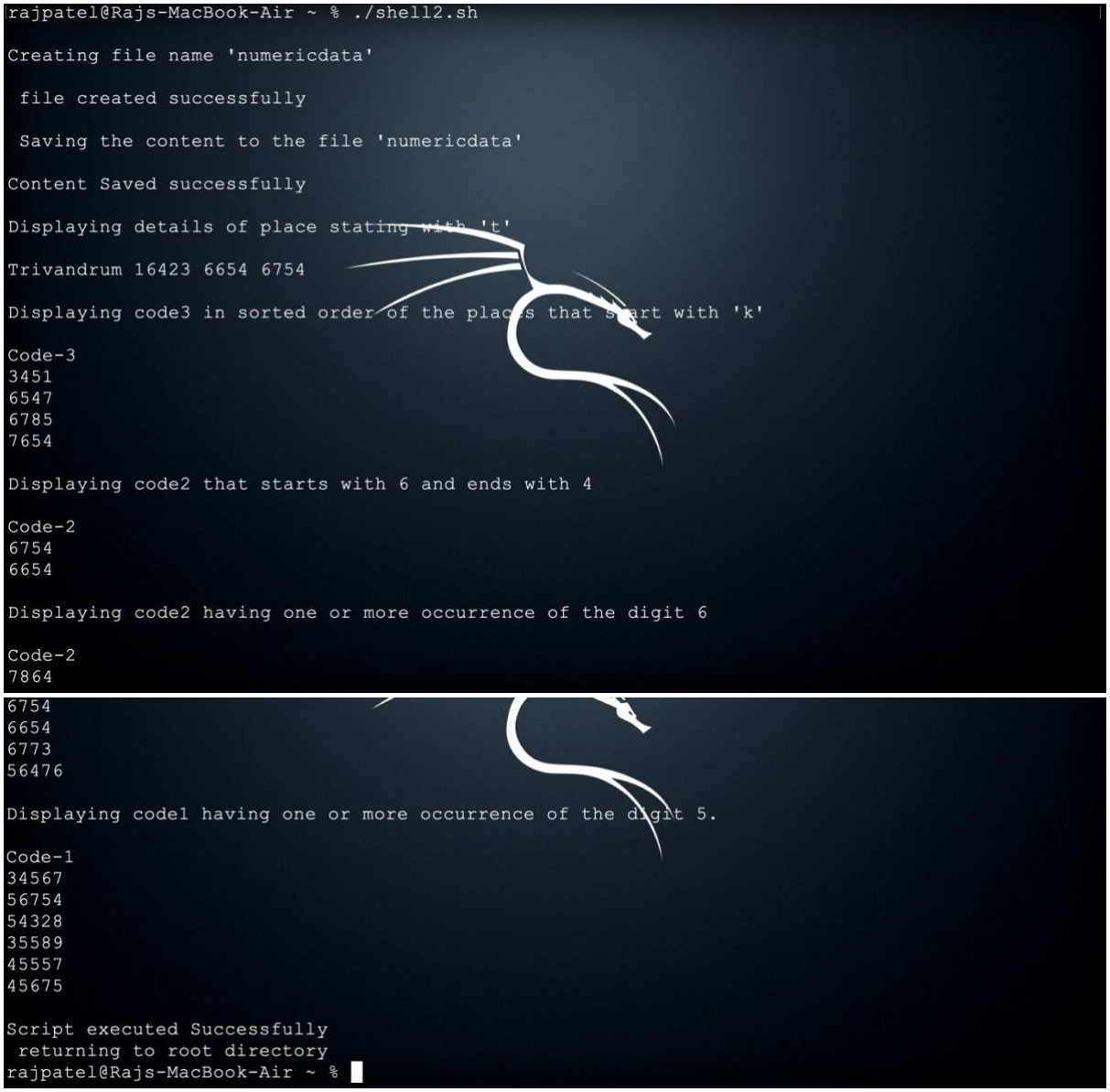
        Karunagappally 34567 7864 6785
        Kollam 56754 6754 7654
        Vallikkavu 54328 7548 45675
        Trivandrum 16423 6654 6754
        Ernakulam 28796 8549 9875
        Kayamkulam 35589 75892 3451
        kottayam 45557 6773 6547
        tirukulum 45675 56476 7896
        (Hint : First field is referred as Place second as code1 third as code2 and fourth as code3)
    b. Display the details of Places that starts with ‘T’(case sensitive)
    c. Display code3 in sorted order(ascending) of the places that start with ‘K’(case insensitive)
    d. Filter code2 that starts with 6 and ends with 4
    e. Filter code2 having one or more occurrence of the digit 6.
    f. Filter all code1 having one or more occurrence of the digit 5.

Script

```
#!/bin/bash
echo " "
echo "Creating file name 'numericdata'"
touch numericdata
echo " "
echo " file created successfully "
echo " "
echo " Saving the content to the file 'numericdata' "
echo " "
echo "Karunagappally 34567 7864 6785" > numericdata
echo "Kollam 56754 6754 7654" >> numericdata
echo "Vallikkavu 54328 7548 45675" >> numericdata
echo "Trivandrum 16423 6654 6754" >> numericdata
echo "Ernakulam 28796 8549 9875" >> numericdata
echo "Kayamkulam 35589 75892 3451" >> numericdata
echo "kottayam 45557 6773 6547" >> numericdata
echo "tirukulum 45675 56476 7896" >> numericdata
echo "Content Saved successfully"
echo " "
echo "Displaying details of place stating with 't' "
echo " "
cat numericdata | grep ^T
echo " "
echo "Displaying code3 insorted order of the places that start with 'k' "
echo " "
```

```
echo "Code-3"
cat numericdata | cut -d ' ' -f 1,4 | grep ^K -i |cut -d ' ' -f 2 | sort -n
echo " "
echo "Displaying code2 that starts with 6 and ends with 4"
echo " "
echo "Code-2"
cat numericdata | cut -d ' ' -f 3 | grep ^6 | grep 4$
echo " "
echo "Displaying code2 having one or more occurrence of the digit 6"
cat numericdata | cut -d ' ' -f 3 | grep -E '6+'
echo " "
echo "Displaying code1 having one or more occurrence of the digit 5."
echo " "
echo "Code-1"
cat numericdata | cut -d ' ' -f 2 | grep -E '5+'
echo " "
echo "Script executed Successfully "
echo " returning to root directory "
cd ~
```

Output


rajpatel@Rajs-MacBook-Air ~ % ./shell2.sh
Creating file name 'numericdata'
file created successfully
Saving the content to the file 'numericdata'
Content Saved successfully
Displaying details of place stating with 't'
Trivandrum 16423 6654 6754
Displaying code3 in sorted order of the places that start with 'k'
Code-3
3451
6547
6785
7654
Displaying code2 that starts with 6 and ends with 4
Code-2
6754
6654
Displaying code2 having one or more occurrence of the digit 6
Code-2
7864
6754
6654
6773
56476
Displaying code1 having one or more occurrence of the digit 5.
Code-1
34567
56754
54328
35589
45557
45675
Script executed Successfully
returning to root directory
rajpatel@Rajs-MacBook-Air ~ %

========== The End ==========