

ACADEMY OF TECHNOLOGY

LAB ASSIGNMENT 2020

Subject: Operating System Lab
Subject Code: PCC-CS592

Discipline: CSE
Semester: 5TH

GROUP-A (Shell Programming)

Solve the following problems using shell script.

ASSIGNMENT-1

1. a) Write a shell script to check whether a year is leap year or not.
- b) Write a shell script to find the GCD and LCM of two numbers.
- c) Write a shell script to check whether an integer number is palindrome or not.
- d) Write a shell script to generate Fibonacci sequence up to a given range.
- e) Write a shell script to find all Armstrong numbers within a given range.

ASSIGNMENT-2

2. Write a shell script to find the value of y using
$$Y(x, n) = \begin{cases} 1+x^2 & \text{when } n=1 \\ 1+x/n & \text{when } n=2 \\ 1+2x & \text{when } n=3 \\ 1+nx & \text{when } n>3 \text{ or } n<1 \end{cases}$$
3. Take three sides of a triangle. Then check whether triangle is formable or not? If yes then find its area. Your program should be flexible for real number inputs.
4. Calculate the value of the following series
$$f(x,n)=1+x^2/2!+x^4/4!+\dots+x^{2*n}/(2*n)!$$
Where x is the variable and n is the number of terms.
5. Determine grade as per following rules using switch case:

Number	Grade
90 – 100	O
80 – 89	E
70 – 79	A
60 – 69	B
50 – 59	C
< 50	F
6. Write a menu driven shell program to perform the following actions depending on number key:
 - a) Contents of the file

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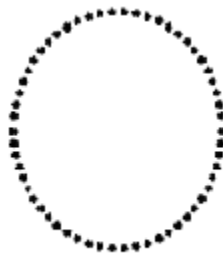
- b) List of users who currently logged in
- c) Present working directory & files under current directory
- d) List of files
- e) Process of users
- f) Today's date
- g) Display the calendar of any year
- h) Exit

ASSIGNMENT-3

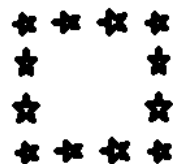
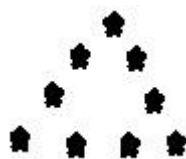
7. a) Write a shell script to print the following Pascal's triangle using function.

```
      1
     1 1
    1 2 1
   1 3 3 1
```

- b) Write a shell script to print the following pattern using tput cup



- c) Write a shell script to print the following patterns using tput cup



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ASSIGNMENT-4

8. Write a shell script to calculate your Age in years months & days format.
(Given i/p in this format: DD/MM/YYYY your date of birth.)
9. Write a shell script to check a given date is valid or not.
10. Write a shell script to sort an int array using bubble sort.
11. Write a shell script to determine the Grade of students as per WBUT rule.
Students name, roll no and marks are taken from an input file and output will store as student name, roll no, marks and grade format in a file.
12. A file contains day_name & temperature for some days. Write a shell script which takes that file name as command line argument. Then it reads day_name & temperature from that file and broadcast the weather as follows. Store the weather report in a file.

Temperature	Weather
<15	Very Cold
>=15 && <25	Cold
>=25 && <35	Hot
>=35	Very hot

ASSIGNMENT-5

13. Read a text file as an input and select the palindrome words from the text and store the palindrome words into another file (omit '.' Or ';' after the word).
14. Read some files & directories through command line argument. Check whether it is a file or directory. If it is a directory then list the files under this directory, if it is a file then show the content of this file and count the line, words & character number of this file and change the permission of the file.
15. Write a shell script to check how many files in your current directory and display the name of the largest and smallest file.

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GROUP-B (C Programming)

ASSIGNMENT-6

- 16.a) Write a C program that will create a child process using the *fork()* system call. Draw the process tree by generating different child process.
- b) Create a child process. Check the memory address and value of a variable before and after some modification from parent and child process.
- c) Write a C program using *fork()* system call that generates the Fibonacci sequence in the child process and prime checking in the parent process. The number will be provided in the command line.

ASSIGNMENT-7

- 17.a) Write a C program where parent process sends a number to child process using PIPE and child process compute whether that number is a prime number or not.
- b) Write a C program to create a child process. Parent process send a string to child process using PIPE then child process will calculate how many, alphabet, numeric and special characters (#, &) are there?

ASSIGNMENT-8

18. a) Write a C program to create multiple threads and check the memory address of a variable before and after modification by all the threads. Synchronize the threads using *lock-unlock*.
- b) Write a C program to create two threads. 1st thread will take input of two matrixes and 2nd thread will perform addition. i.e after complete of the execution of 1st thread, 2nd thread will start execution.

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ASSIGNMENT-9

19. a) Write a C program to implement *reader-writer* problem using Semaphore.
(Writer has the highest priority)
- b) Write a C program to implement *Producer-Consumer* problem using Semaphore.

ASSIGNMENT-10

20. Write a program to implement *Dining philosopher's* problem using Semaphore.