



## **S.B. JAIN INSTITUTE OF TECHNOLOGY MANAGEMENT & RESEARCH, NAGPUR**

### **Practical 03**

**Aim:** Automate student marksheets generation, system information display, Fibonacci and prime number generation, and file management operations using shell scripts to enhance computational efficiency and user interaction.

**Name:** Divyani C. Patil

**USN:** CM24010

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**Date of Performance:**

**Date of Submission:**

❖ **Aim:** Automate student marksheet generation, system information display, Fibonacci and prime number generation, and file management operations using shell scripts to enhance computational efficiency and user interaction.

❖ **Tasks to be done in this Practical.**

- a) Write a shell script to generate mark- sheet of a student. Take 3 subjects, calculate and display total marks, percentage and Class obtained by the student.
- b) Write a menu driven shell script which will print the following menu and execute the given task.
  - Display calendar of current month.
  - Display today's date and time.
  - Display usernames those are currently logged in the system.
  - Display your terminal number
- c) Write a shell script which will generate first n Fibonacci numbers like: 1, 1, 2, 3, 5, 13
- d) Write a shell script which will accept a number b and display first n prime numbers as output.
- e) Write menu driven program for file handling activity
  - Creation of file.
  - Write content in the file.
  - Upend file content.
  - Delete file content

❖ **Objectives:**

1. Automate marksheet generation with total, percentage, and class classification.
2. Develop menu-driven scripts for system information and file operations.
3. Generate Fibonacci and prime numbers for user-defined inputs.

❖ **Requirements:**

✓ **Hardware Requirements:**

- Processor: Minimum 1 GHz
- RAM: 512 MB or higher
- Storage: 100 MB free space



✓ **Software Requirements:**

- Operating System: Linux/Unix-based
- Shell: Bash 4.0 or higher
- Text Editor: Nano, Vim, or any preferred editor

❖ **Theory:**

Shell scripting is a powerful way to automate repetitive tasks and manage system operations efficiently. It allows users to write programs using shell commands and scripting constructs. Shell scripts are interpreted line-by-line by a shell interpreter, making them ideal for administrative tasks, file management, and system automation. This practical encompasses a variety of real-world scenarios that demonstrate the utility of shell scripting for computing tasks and resource management.

**1. Marksheets Generation**

This script takes input marks for three subjects, calculates the total marks, percentage, and determines the class of the student based on predefined conditions. Conditional statements (if-else) are used to classify the performance into distinction, first class, second class, or fail. This exercise emphasizes the use of arithmetic operations and decision-making constructs.

Key concepts include:

- Reading user input using read
- Arithmetic operations with \$((expression))
- Conditional statements for decision-making

**2. Menu-Driven Script for System Information**

Menu-driven scripts enhance user interaction by presenting a list of options for performing different tasks. In this practical, options are provided to display the calendar of the current month, the current date and time, logged-in users, and the terminal number. The script utilizes looping constructs (while) and case statements for structured flow control.

**Commands used:**

- cal for displaying the calendar
- date for showing current date and time
- who to list logged-in users
- tty to identify the terminal



**3. Fibonacci Number Generation**

Fibonacci numbers are a sequence where each term is the sum of the two preceding ones. The script uses iterative constructs (for loop) to generate n terms based on user input. This practical illustrates the use of loop control and variable swapping to generate series data efficiently.

#### 4. Prime Number Display

This script accepts an integer n and outputs the first n prime numbers. A nested loop checks divisibility to determine if a number is prime. The practical demonstrates logic building for number-theoretic operations using loops and conditionals.

#### 5. Menu-Driven File Management

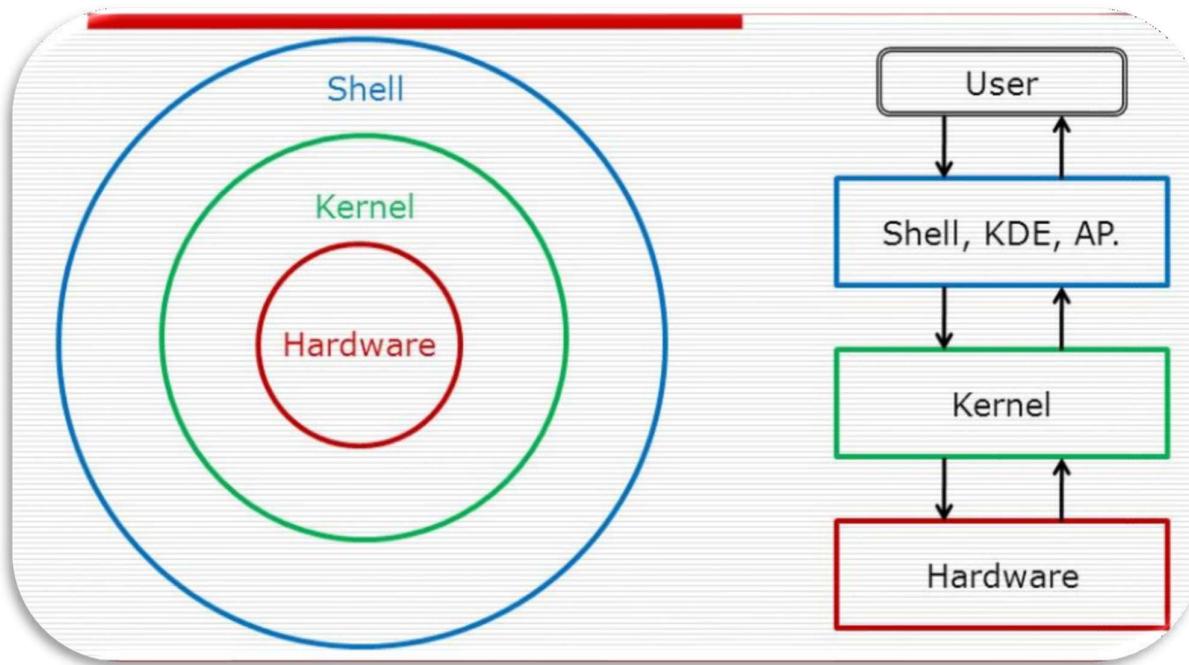
The file handling script enables users to create, write, append, and delete file content. The case construct manages different file operations.

Commands include:

- touch to create files
- cat for writing and appending content
- rm for deleting files

This exercise emphasizes text manipulation, input handling, and file control mechanisms in Unix-like environments.

#### Diagrammatical View of Shell



❖ CODES

1. Write a shell script to generate mark- sheet of a student. Take 3 subjects, calculate and display total marks, percentage and Class obtained by the student.

**Output 1:**

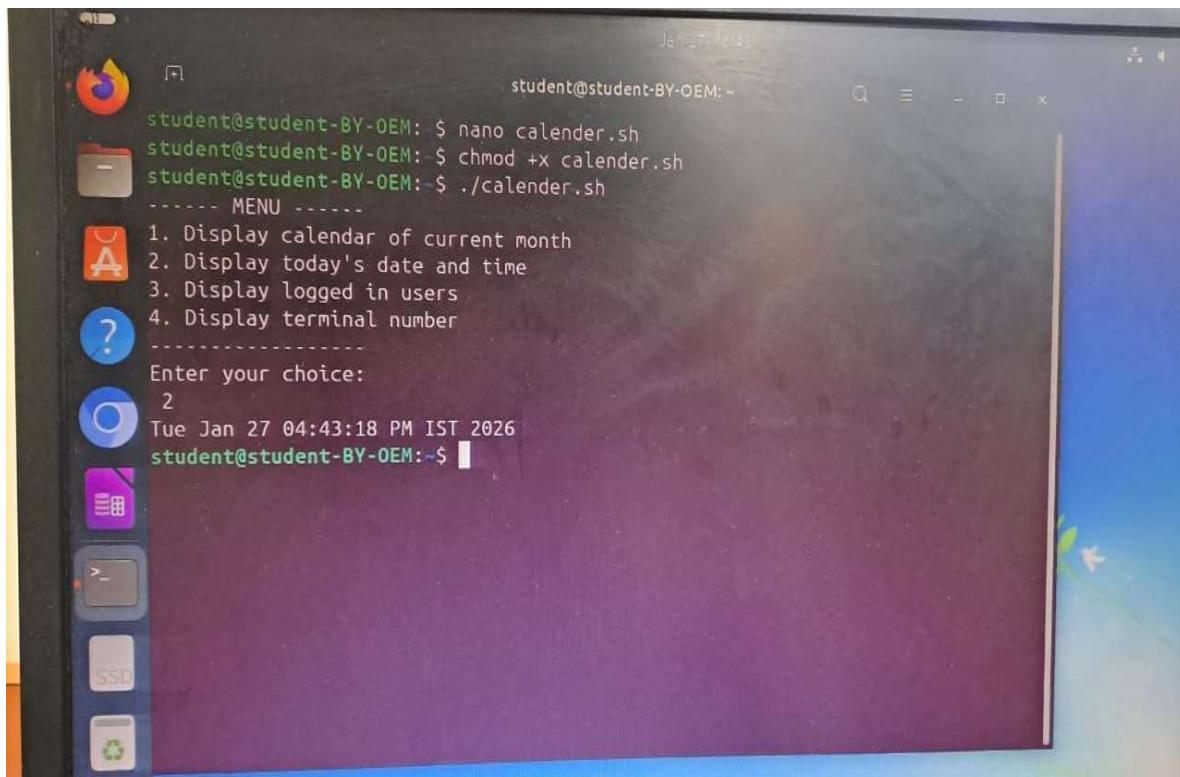
A screenshot of a Linux desktop environment showing a terminal window. The terminal window has a dark background and displays the following text:

```
student@student-BY-OEM: $ nano fib.sh
student@student-BY-OEM: $ chmod +x fib.sh
student@student-BY-OEM: $ ./fib.sh
Enter Student Name:
divyani
Enter Subject 1 Marks:
20
Enter Subject 2 Marks:
19
Enter Subject 3 Marks:
18
----- MARK SHEET -----
Name: divyani
Total: 57
Percentage: 19%
Class: Fail
student@student-BY-OEM:~$ nano fib.sh
student@student-BY-OEM:~$ nano fib.sh
student@student-BY-OEM:~$
```

The terminal window is titled "student@student-BY-OEM:~". The desktop environment includes icons for various applications like a browser, file manager, and system tools on the left side.

2. Write a menu driven shell script which will print the following menu and execute the given task.
- Display calendar of current month.
  - Display today's date and time.
  - Display usernames those are currently logged in the system.
  - Display your terminal number

**Output:**



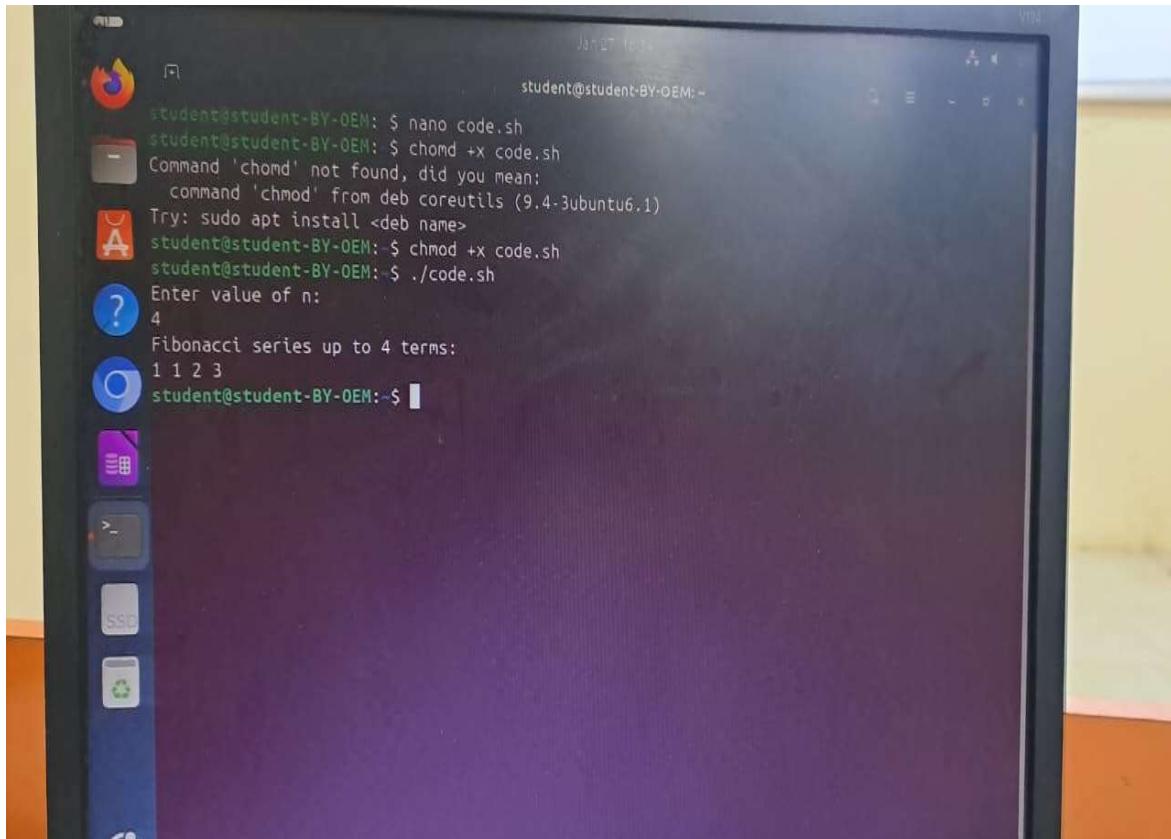
The screenshot shows a terminal window on a Linux desktop environment. The terminal window title is "student@student-BY-OEM: ~". The terminal content is as follows:

```
student@student-BY-OEM: $ nano calender.sh
student@student-BY-OEM: $ chmod +x calender.sh
student@student-BY-OEM: $ ./calender.sh
----- MENU -----
1. Display calendar of current month
2. Display today's date and time
3. Display logged in users
4. Display terminal number
-----
Enter your choice:
2
Tue Jan 27 04:43:18 PM IST 2026
student@student-BY-OEM:~$
```

The desktop background features a colorful gradient with a small flower icon. The left side of the screen shows a vertical dock with icons for a browser, file manager, terminal, and system tools like SSD and recycling bin.

- 3. Write a shell script which will generate first n Fibonacci numbers like:  
1, 1, 2, 3, 5, 13**

**Output:**



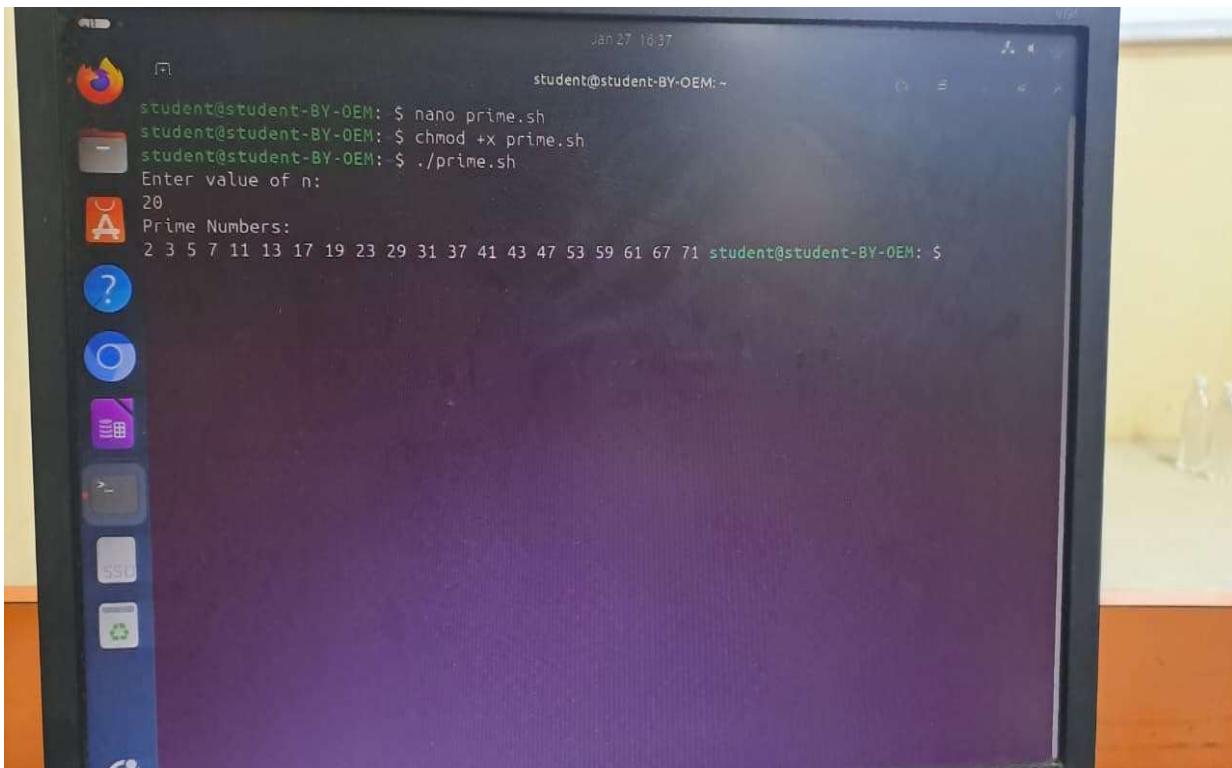
A screenshot of a Linux desktop environment showing a terminal window. The terminal window has a dark background with light-colored text. It displays the following command-line session:

```
student@student-BY-OEM: $ nano code.sh
student@student-BY-OEM: $ chmod +x code.sh
Command 'chomd' not found, did you mean:
  command 'chmod' from deb coreutils (9.4-3ubuntu6.1)
Try: sudo apt install <deb name>
student@student-BY-OEM: $ chmod +x code.sh
student@student-BY-OEM: $ ./code.sh
Enter value of n:
4
Fibonacci series up to 4 terms:
1 1 2 3
student@student-BY-OEM: $
```

The terminal window is located on a desktop with a purple gradient background. To the left of the terminal is a vertical dock containing icons for various applications, including a browser, file manager, terminal, and system monitoring tools.

- 4. Write a shell script which  
will accept a number b and display first n prime numbers as output.**

**Output:**



A screenshot of a Linux desktop environment showing a terminal window. The terminal window title bar says "student@student-BY-OEM: ~". The date and time "Jan 27 10:37" are displayed at the top right of the terminal window. The terminal window contains the following text:

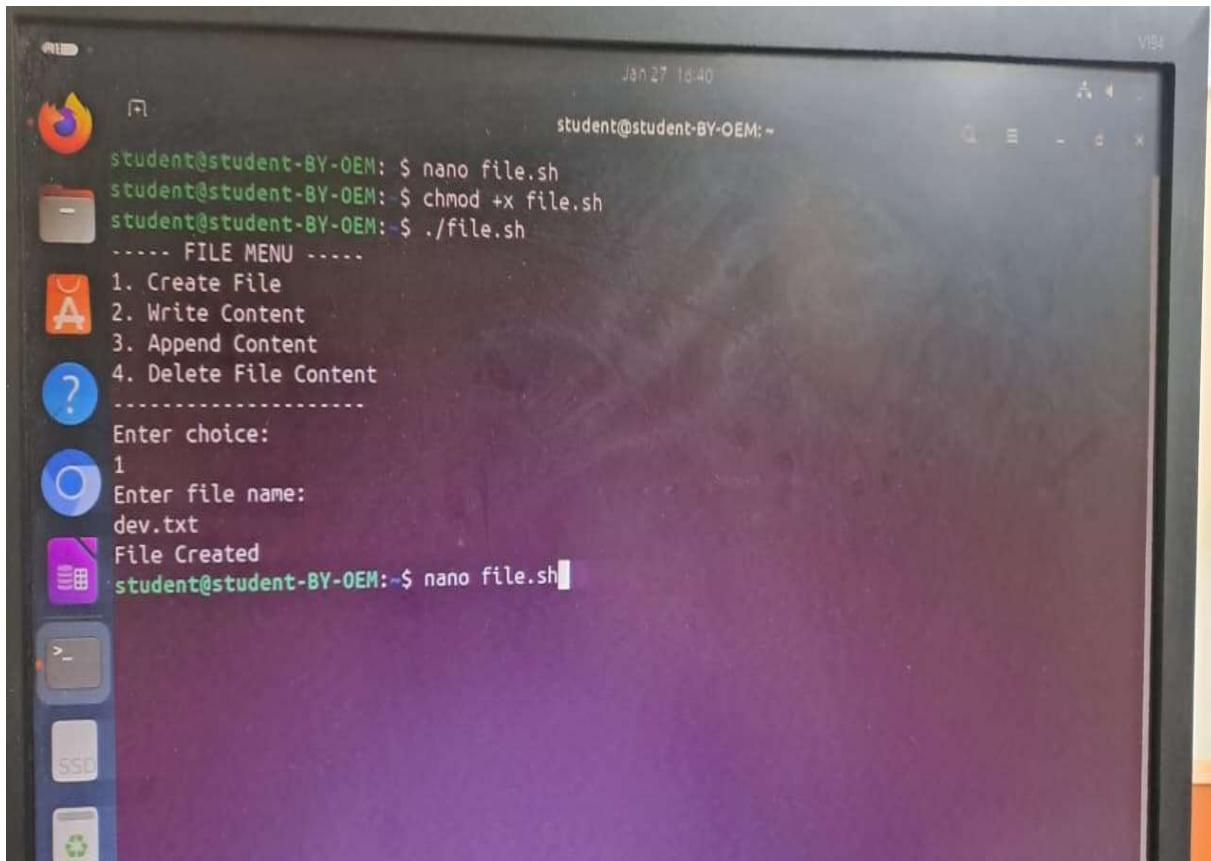
```
student@student-BY-OEM: $ nano prime.sh
student@student-BY-OEM: $ chmod +x prime.sh
student@student-BY-OEM: $ ./prime.sh
Enter value of n:
20
Prime Numbers:
2 3 5 7 11 13 17 19 23 29 31 37 41 43 47 53 59 61 67 71 student@student-BY-OEM: $
```

The desktop environment includes a dock with various icons: a red browser icon, a grey folder icon, a blue question mark icon, a blue circle icon, a purple square icon, a grey square icon with a red dot, and an orange recycling bin icon. The background is a purple gradient.

5. Write menu driven program for file handling activity

- Creation of file.
- Write content in the file.
- Upend file content.
- Delete file content

**Output:**



The screenshot shows a terminal window on a Linux desktop environment. The terminal output is as follows:

```
student@student-BY-OEM: ~
student@student-BY-OEM: $ nano file.sh
student@student-BY-OEM: $ chmod +x file.sh
student@student-BY-OEM: $ ./file.sh
----- FILE MENU -----
1. Create File
2. Write Content
3. Append Content
4. Delete File Content
-----
Enter choice:
1
Enter file name:
dev.txt
File Created
student@student-BY-OEM:~$ nano file.sh
```

The terminal window has a dark background with light-colored text. It features a dock at the bottom with icons for a browser, file manager, terminal, and system status. The title bar shows the date and time as "Jan 27 16:40".

❖ **Conclusion:** In this practical, we conclude that shell scripting efficiently automates tasks like marksheet generation, system information display, number computations, and file management, enhancing system operations and user interaction through command-line utilities.

❖ **Discussion Questions:**

1. **What is the purpose of using shell scripting in this practical?**
2. **Which command is used to display the current date and time?**
3. **How does the script calculate the Fibonacci sequence?**
4. **Which command is used to create a file in the file management script?**
5. **How does the prime number script determine if a number is prime?.**

❖ **References:**

- [https://www.tutorialspoint.com/unix/shell\\_scripting.html](https://www.tutorialspoint.com/unix/shell_scripting.html)  
<https://www.javatpoint.com/shell-scripting-tutorial>

Date: \_\_\_\_\_ / \_\_\_\_\_ /2026

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**Signature**  
Course Coordinator  
B.Tech CSE(AIML)  
Sem: 4 / 2025-26