Introduction:

This manual guides users through the key functionalities and practical usage of the **Printing Management System (PMS).** This PMS is a shell-based application designed to efficiently manage the document printing process in academic or office environments.

The system is designed to assist users in managing their entire printing workflow with ease and efficiency. Users can submit print requests directly through the shell interface, providing necessary details such as file name, page count, and preferred payment method. Once submitted, they can track the status of their requests, whether it is pending or completed, ensuring transparency throughout the process. The system supports both one-time payments and pre-paid options, allowing users to manage their payments according to their convenience. For pre-paid users, pages are automatically deducted from their balance, eliminating the need to enter payment details repeatedly. Additionally, the PMS maintains a structured history of all print requests, including statuses and payment records, which helps both users and operators monitor activity and resolve disputes if any arise. This makes the system particularly valuable in high-traffic environments like university labs, libraries, and institutional printing centers, where managing numerous requests manually can lead to delays and confusion.

The objective of this project is to provide hands-on experience in using a shell-based system to manage day-to-day printing needs efficiently.

System Requirements:

- A terminal-based Linux environment (e.g., Ubuntu, WSL).
- Pre-installed scripts and permission to execute shell programs.

Learning Objectives:

1. To understand and implement file-based data management using plain text files (e.g., prepaid.txt, history.txt) in Shell scripting.

2. To practice reading from and writing to files using tools like awk, grep, sed, and shell redirection.

3. To automate conditional workflows such as approval/rejection processes through structured logic (if, case, while, etc.).

4. To modularize functionality into functions and reuse them (e.g., approve_request, see_purchased_packages).

5. To learn how to safely update file contents using temporary files and overwrite techniques (> temp.txt && mv temp.txt original.txt).

Manual:

This manual provides a comprehensive guide to the Printing Management System (PMS) for both Admin and Users. This guide provides a user-friendly overview of the Printing Management System (PMS) features.


```
------------------------------------
 Welcome to Printing Management System
------------------------------------

1. Register as User
2. User Login
3. Register as Admin
4. Admin Login
5. Exit

Please choose an option: |
```

Image-1: The first page after running the project in the terminal

I. User Roles:

There are two primary roles within the **Printing Management System (PMS)**:

• **Admin:**

The Admin has full access to all system functionalities. Responsibilities include:

- Approving or rejecting print requests.
- Verifying bKash transaction IDs.
- Managing and updating prepaid package approvals.

- Viewing system-wide history logs.

• User:

The User (typically a student or staff member) has limited access based on their role. Their functionalities include:

- Registering and logging into the PMS.

- Submitting print requests with desired options (copies, color, print type).

- Making payments via bKash or using prepaid page packages.

- Viewing their personal print request history.

- Managing and recharging their prepaid balance when necessary.

II. User Manual:

Image-2: User Registration

Image-3: User Dashboard

1. Submit a Print Request:

- This allows the user to specify the name of a PDF file they wish to print.

- During submission, users are prompted to select:

- o **Number of copies**
- o **Print color** (Color or Black & White)
- o **Print type** (One-Sided or Double-Sided)
- The system will also ask for a **bKash transaction ID** or check prepaid balance (if available) to process the payment.

```
--------------------------------
        Print Request Submission
--------------------------------
Enter the file name to print (PDF): roundrobbin.pdf
Enter the number of copies: 1
Enter the number of pages in the document: 6
Choose print color (1 for Black & White, 2 for Color): 2
Choose print type (1 for One-Sided, 2 for Double-Sided): 1
Enter bKash Transaction ID (or type 'prepaid' for prepaid users):
prepaid
Prepaid balance OK. Your request will be processed after admin approval.
Your print request has been submitted. It is currently pending.
Press any key to return to the welcome screen...
```

Image-4: Submission of Print Request using prepaid package

```
--------------------------------
        Print Request Submission
--------------------------------
Enter the file name to print (PDF): frontpage.pdf
Enter the number of copies: 1
Enter the number of pages in the document: 1
Choose print color (1 for Black & White, 2 for Color): 2
Choose print type (1 for One-Sided, 2 for Double-Sided): 1
Enter bKash Transaction ID (or type 'prepaid' for prepaid users):
DEVFWYV23BC
Your print request has been submitted. It is currently pending.
Press any key to return to the welcome screen...
```

Image-5: Submission of Print Request using Bkash Transaction ID

2. **Buy Prepaid Printing Package:**

- Users can purchase a **prepaid package** (e.g., 100 pages for a fixed amount).
- The system records the number of pages and updates the user's prepaid balance.
- The **transaction ID** is verified by the admin.
- Once approved, the pages are added to the user's account and can be used for future prints.

```
--------------------------------
        Buy Prepaid Package
--------------------------------
Choose a package:
1. 50 pages - 100 BDT
2. 100 pages - 180 BDT
3. 200 pages - 350 BDT
Enter your choice (1/2/3): 2
Enter your bKash Transaction ID: DVYFSHV23U
DEBUG: username='user110', bkash_id='DVYFSHV23U', pages='100', amount='180'
Your prepaid package request has been submitted for admin approval.
You'll be able to use the pages once approved.
Press any key to return to the user menu...
```

Image-6: Buying of Prepaid Package using option 2

3. See History

- Displays the **user's personal print request history**.

- For each past request, the following details are shown:

  o Username

  o File name

  o Number of pages printed

  o Status (Pending, Completed, etc.)

  o Payment type (bKash or Prepaid)


```
--------------------------------
        Your Print History
--------------------------------
Username: user110
File: frontpage.pdf
Copies: 1
Pages per Copy: 1
Color: Color
Print Type: One-Sided
Payment Method: DEVFWYV23BC
Status: Approved


Press any key to return to the dashboard...
```

Image-7: View history for user

4. See Purchased Packages

- Shows details of **all prepaid packages** the user has bought.

- Information includes:

- Package size (e.g., 100 pages)
- Remaining balance

```
--------------------------------
       Your Purchased Packages
--------------------------------
Transaction ID          Pages Remaining
--------------------------------------
DVGDVH23                100
--------------------------------------
Total pages remaining: 100

Press any key to return to the user menu...|
```

Image-8: See purchased packages by user

```
----------------------------------
       Your Purchased Packages
----------------------------------
Transaction ID          Pages Remaining
------------------------------------------
DVGDVH23                94
------------------------------------------
Total pages remaining: 94

Press any key to return to the user menu...|
```

Image-9: See purchased packages by user after using prepaid package

5. Check Print Status

- Lets the user check the **current status** of any submitted print request.
- Possible statuses include:
    - **Pending**: Awaiting admin approval or payment verification.
    - **Approved**: Approved by the admin.

```
--------------------------------
       Your Print Request Status
--------------------------------
File: roundrobbin.pdf
Status: Pending
----------------------------

Press any key to return to the user menu...
```

Image-10: View status of the print request

6. Logout

- Ends the current session and safely logs the user out of the PMS system.

- Prevents unauthorized access and ensures data integrity.

III. Admin Manual:

Image-11: Admin Registration

Image-12: Admin Dashboard

System Configuration:

1. View Pending Print Requests

- Displays a list of **all submitted print requests** across all users.

- Includes key details such as:

  - Order ID

  - Username

  - File Name

  - Number of pages/copies

  - Print color and type

- Payment method (bKash or prepaid)
- Status (Pending)

```
----------------------------------
        All Print Requests
----------------------------------
OrderID: 1749975658
Username: user2
File: sdf.pdf
Copies: 3
Pages per Copy: 50
Color: Black & White
Print Type: One-Sided
Payment Method: asfg1233
Status: Pending
----------------------------
OrderID: 1750171999
Username: user110
File: roundrobbin.pdf
Copies: 1
Pages per Copy: 6
Color: Color
Print Type: One-Sided
Payment Method: prepaid
Status: Pending
----------------------------

Press any key to return to the admin menu...|
```

Image-13: Viewing pending print requests as an admin

2. Approve/Reject Print Requests

- Allows the admin to **review individual print requests**.
- Admin checks:
  - Validity of the attached bKash transaction ID (if not using prepaid)
  - Print specifications
- Based on verification, the admin can:
  - **Approve**: The print job is approved.
  - **Reject**: The job is canceled.

Image-14: Approve/reject print requests

3. View Completed Requests

- Shows a filtered list of requests that have been marked as **Completed**.

- Useful for auditing, reporting, and ensuring print delivery.

Image-15: View completed requests

4. Approve/Reject Prepaid Packages

- Lists all **pending prepaid package purchase requests**.
- Each request includes:
  - Username
  - Package size (e.g., 100 pages)
  - bKash transaction ID
- Admin validates the transaction and then:
  - **Approves**: Pages are credited to the user's account.
  - **Rejects**: The request is canceled.


```
-------------------------------
    Pending Prepaid Requests
-------------------------------
Username: user110
Transaction ID: DVGDVH23
Pages Requested: 100
Amount: 180 BDT
Status: Pending
-------------------------------
Enter Transaction ID to manage (or '0' to cancel): DVGDVH23
1. Approve
2. Reject
Choose action (1/2): 1
Press any key to return to the admin menu...
```

Image-16: Approve/Reject Prepaid packages

5.View Prepaid Packages of All Users

- Displays a list of all users who have active prepaid printing packages.
- Each entry includes
  - Username
  - Remaining Pages in the Package
  - bKash transaction ID
- Data is fetched from prepaid.txt in real-time.
- Helps admin verify user eligibility during print approval

- Ensures transparency and allows efficient monitoring of prepaid balances.


```
--------------------------------
  Prepaid Packages of All Users
--------------------------------
Username              Transaction ID            Pages Remaining
----------------------------------------------------------------

turab                 123456                    50

user1                 qwerty                    38
                      asdfgh                    100

user2                 eid21                     100

user1                 user1abc                  50

sumu                  sumu110                   46

sumaiya110            FEBHVEF23H                100

user110               DVGDVH23                  79
----------------------------------------------------------------

Press any key to return to the admin menu...
```

Image 15: View Prepaid Package of All Users

6. Logout

- Securely logs the admin out of the system.
- Prevents unauthorized access to sensitive administrative features.

Important Notes:

- This manual provides a general overview of the Printing Management System (PMS) and its primary functionalities.
- Users should access only the features available to them based on their assigned role (User or Administrator).
- Admins are responsible for maintaining proper access control, verifying payments, and managing system integrity.
- Users are expected to submit accurate print requests and valid payment information to avoid delays in processing.

By following this manual, both **admins** and **users** can effectively navigate and utilize the PMS to manage printing activities smoothly and securely.

Conclusion:

By completing the project, we gained hands-on experience in building and operating a **Printing Management System (PMS)** in a shell-based environment. This experience offered practical insights into how automated systems can improve task coordination and enforce accountability through secure payment and user tracking mechanisms.

The PMS project has strengthened our understanding of print service workflows, user-role management, and system-level scripting. Its core functionalities demonstrate how such systems can:

- Reduce manual work,
- Ensure accurate record keeping, and
- Improve service delivery in academic and institutional environments.

This project showcases the power of simple but efficient automation in managing real-world tasks like printing services.