LINUX LAB

Telecom Billing System – Project Report

Name: MARIAM FATIMA

SAP ID: 590028369

Name: AYUSH KUMAR
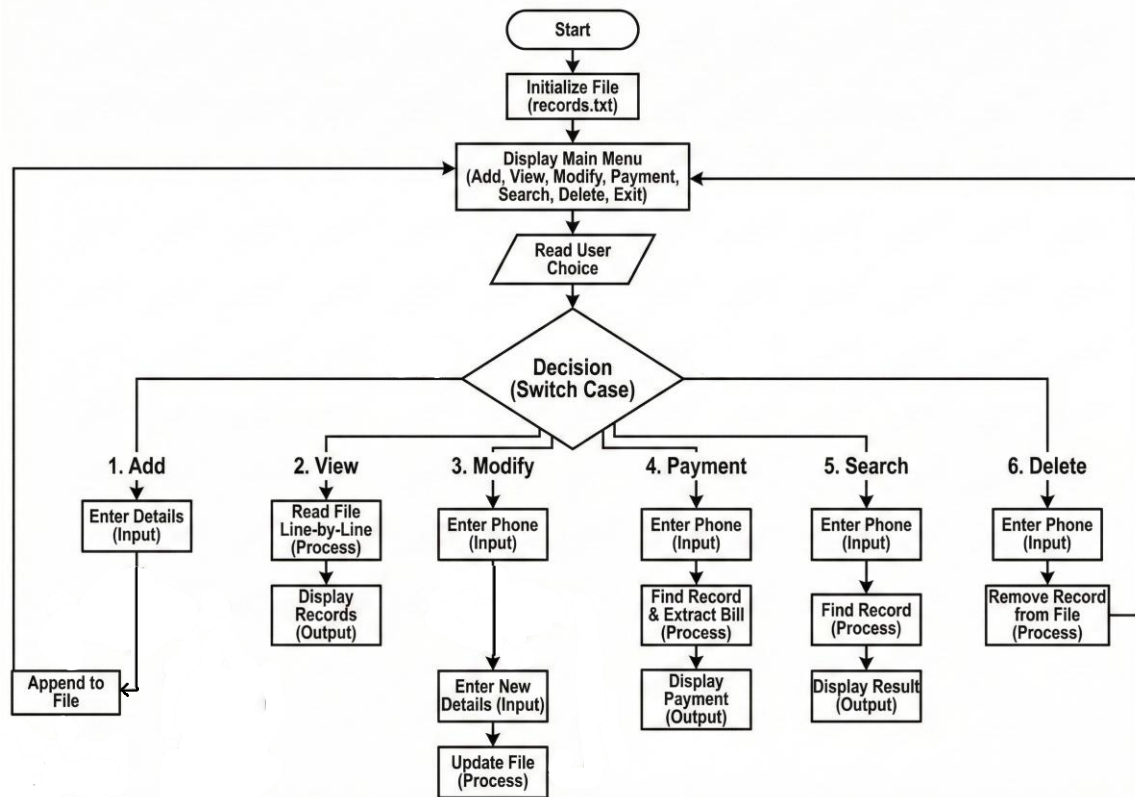
SAP ID: 590028710

Batch: 71

SUBMITTED TO: Mr. Vinod Kumar

Problem Statement:

The telecom industry handles massive volumes of customer billing data. This project implements a Telecom Billing System using Linux Shell Scripting to manage customer records with functionalities such as adding, viewing, modifying, searching, deleting records and viewing payment details.

Flowchart:

Telecom Billing System Process

Algorithm:

1. Start the program.
2. Create 'records.txt' file if not present.
3. Display menu with available operations.
4. Take user choice as input.
5. Use case-esac to perform:
   - Add new record (unique phone constraint)
   - View all records
   - Modify a specific record
   - View payment details
   - Search a record using phone number
   - Delete a record
6. After operation, return to menu.
7. Exit when user selects option 7.

Problems Faced:

• Ensuring phone numbers remain unique
It was challenging to make sure no two customers had the same phone number. To solve this, the script checked existing records before adding or modifying any entry.

• Handling record modification without duplication
Updating a record without accidentally creating a duplicate entry required careful handling. The solution was to remove the old record first, then safely add the updated one.

• Managing file operations safely using temporary buffers
Editing or deleting data directly in the main file could cause errors or corruption. Using a temporary file ensured safer updates and protected the original data.

Code Snippet:

```bash
#!/bin/bash

FILE="records.txt"
touch "$FILE"

phone_exists() {
    local phone="$1"
    grep -qF "|$phone|" "$FILE"
}

add_record() {
    echo "Enter customer name:"
    read name

    while true; do
        echo "Enter phone number:"
        read phone

        if phone_exists "$phone"; then
            echo "A customer is already registered with this phone number. Please enter a different one."
        else
            break
        fi
    done

    echo "Enter address:"
    read address
    echo "Enter bill amount:"
    read bill

    echo "$name|$phone|$address|$bill" >> "$FILE"
    echo "Record Added Successfully!"
}
```

```
while true
do
    echo "
TELECOM BILLING SYSTEM
1. Add new record
2. View Records
3. Modify record
4. View Payment
5. Search record
6. Delete record
7. Exit
.........................
Enter your choice:"
    read choice
    case $choice in
        1) add_record ;;
        2) view_records ;;
        3) modify_record ;;
        4) view_payment ;;
        5) search_record ;;
        6) delete_record ;;
        7) exit ;;
        *) echo "Invalid choice!" ;;
    esac
done
```

Source Code:

```bash
#!/bin/bash

FILE="records.txt"
touch "$FILE"

phone_exists() {
    local phone="$1"
    grep -qF "|$phone|" "$FILE"
}

add_record() {
    echo "Enter customer name:"
    read name

    while true; do
        echo "Enter phone number:"
        read phone

        if phone_exists "$phone"; then
            echo "A customer is already registered with this phone number. Please enter a different one."
        else
            break
        fi
    done

    echo "Enter address:"
    read address
    echo "Enter bill amount:"
    read bill

    echo "$name|$phone|$address|$bill" >> "$FILE"
    echo "Record Added Successfully!"
}
```

```bash
view_records() {
    if [ ! -s "$FILE" ]; then
        echo "No records found!"
        return
    fi

    echo "---Customer Records---"
    while IFS="|" read -r name phone address bill
    do
        echo "Name    : $name"
        echo "Phone   : $phone"
        echo "Address: $address"
        echo "Bill    : Rs $bill"
        echo "--------------------"
    done < "$FILE"
}

search_record() {
    echo "Enter phone number to search:"
    read search

    grep -F "|$search|" "$FILE" > temp.txt

    if [ -s temp.txt ]; then
        echo "Record Found:"
        cat temp.txt
    else
        echo "No matching record found"
    fi

    rm -f temp.txt
}

delete_record() {
    echo "Enter phone number to delete:"
    read del

    grep -Fv "|$del|" "$FILE" > temp.txt
    mv temp.txt "$FILE"
    echo "Record deleted (if it existed)"
}
```

```bash
modify_record() {
    echo "Enter phone number to modify:"
    read mod

    record=$(grep -F "|$mod|" "$FILE")

    if [ -z "$record" ]; then
        echo "Record not found"
        return
    fi

    old_name=$(echo "$record"    | cut -d "|" -f 1)
    old_phone=$(echo "$record"   | cut -d "|" -f 2)
    old_address=$(echo "$record" | cut -d "|" -f 3)
    old_bill=$(echo "$record"    | cut -d "|" -f 4)

    grep -Fv "|$mod|" "$FILE" > temp.txt
    mv temp.txt "$FILE"

    echo "Enter new name (leave blank to keep: $old_name):"
    read name
    [ -z "$name" ] && name="$old_name"

    while true; do
        echo "Enter new phone (leave blank to keep: $old_phone):"
        read phone

        if [ -z "$phone" ]; then
            phone="$old_phone"
        fi

        if [ "$phone" = "$old_phone" ]; then
            break
        fi

        if phone_exists "$phone"; then
            echo "A customer is already registered with this phone number. Please enter a different one."
        else
            break
        fi
    done

    echo "Enter new address (leave blank to keep: $old_address):"
    read address
    [ -z "$address" ] && address="$old_address"

    echo "Enter new bill amount (leave blank to keep: $old_bill):"
    read bill
    [ -z "$bill" ] && bill="$old_bill"

    echo "$name|$phone|$address|$bill" >> "$FILE"
    echo "Record Modified Successfully"
}
```

```bash
view_payment() {
    echo "Enter phone number:"
    read num

    record=$(grep -F "|$num|" "$FILE")

    if [ -z "$record" ]; then
        echo "Record not found"
        return
    fi

    name=$(echo "$record"    | cut -d "|" -f 1)
    phone=$(echo "$record"   | cut -d "|" -f 2)
    address=$(echo "$record" | cut -d "|" -f 3)
    bill=$(echo "$record"    | cut -d "|" -f 4)

    echo "----Payment Details----"
    echo "Customer    : $name"
    echo "Phone       : $phone"
    echo "Address     : $address"
    echo "Pending Bill: Rs $bill"
    echo "-----------------------"
}


while true
do
    echo "
TELECOM BILLING SYSTEM
1. Add new record
2. View Records
3. Modify record
4. View Payment
5. Search record
6. Delete record
7. Exit
.........................
Enter your choice:"
    read choice
    case $choice in
        1) add_record ;;
        2) view_records ;;
        3) modify_record ;;
        4) view_payment ;;
        5) search_record ;;
        6) delete_record ;;
        7) exit ;;
        *) echo "Invalid choice!" ;;
    esac
done
```

Output:

```
ayush@ayush-VMware20-1:~$ vi project.sh
ayush@ayush-VMware20-1:~$ chmod +x project.sh
ayush@ayush-VMware20-1:~$ ./project.sh

TELECOM BILLING SYSTEM
1. Add new record
2. View Records
3. Modify record
4. View Payment
5. Search record
6. Delete record
7. Exit
.........................
Enter your choice:
1
Enter customer name:
Harsh Kumar
Enter phone number:
9999988888
Enter address:
Dehradun
Enter bill amount:
900
Record Added Successfully!

TELECOM BILLING SYSTEM
1. Add new record
2. View Records
3. Modify record
4. View Payment
5. Search record
6. Delete record
7. Exit
.........................
Enter your choice:
2
---Customer Records---
Name    : Harsh Kumar
Phone   : 9999988888
Address: Dehradun
Bill    : Rs 900
--------------------
```

```
TELECOM BILLING SYSTEM
1. Add new record
2. View Records
3. Modify record
4. View Payment
5. Search record
6. Delete record
7. Exit
..........................
Enter your choice:
3
Enter phone number to modify:
9999988888
Enter new name (leave blank to keep: Harsh Kumar):

Enter new phone (leave blank to keep: 9999988888):
8888877777
Enter new address (leave blank to keep: Dehradun):

Enter new bill amount (leave blank to keep: 900):
3000
Record Modified Successfully

TELECOM BILLING SYSTEM
1. Add new record
2. View Records
3. Modify record
4. View Payment
5. Search record
6. Delete record
7. Exit
..........................
Enter your choice:
2
---Customer Records---
Name   : Harsh Kumar
Phone  : 8888877777
Address: Dehradun
Bill   : Rs 3000
--------------------
```

```
TELECOM BILLING SYSTEM
1. Add new record
2. View Records
3. Modify record
4. View Payment
5. Search record
6. Delete record
7. Exit
..........................
Enter your choice:
4
Enter phone number:
8888877777
----Payment Details----
Customer   : Harsh Kumar
Phone      : 8888877777
Address    : Dehradun
Pending Bill: Rs 3000
------------------------

TELECOM BILLING SYSTEM
1. Add new record
2. View Records
3. Modify record
4. View Payment
5. Search record
6. Delete record
7. Exit
..........................
Enter your choice:
5
Enter phone number to search:
8888877777
Record Found:
Harsh Kumar|8888877777|Dehradun|3000
```

```
TELECOM BILLING SYSTEM
1. Add new record
2. View Records
3. Modify record
4. View Payment
5. Search record
6. Delete record
7. Exit
..........................
Enter your choice:
6
Enter phone number to delete:
8888877777
Record deleted (if it existed)

TELECOM BILLING SYSTEM
1. Add new record
2. View Records
3. Modify record
4. View Payment
5. Search record
6. Delete record
7. Exit
..........................
Enter your choice:
2
No records found!

TELECOM BILLING SYSTEM
1. Add new record
2. View Records
3. Modify record
4. View Payment
5. Search record
6. Delete record
7. Exit
..........................
Enter your choice:
5
Enter phone number to search:
8888877777
No matching record found
```

```
TELECOM BILLING SYSTEM
1. Add new record
2. View Records
3. Modify record
4. View Payment
5. Search record
6. Delete record
7. Exit
..........................
Enter your choice:
7
ayush@ayush-VMware20-1:~$ ▯
```