B.M.S College of Engineering

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DEPARTMENT OF INFORMATION SCIENCE & ENGINEERING

Course – Unix System Programming

Course Code – 19IS4PWUSP

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Report on Unix System Programming Project

Product Management System

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CERTIFICATE

Certified that the Project has been successfully presented at **B.M.S College of Engineering** by **Lekha G Patel, Kashish Agarwal and Khushi Agrawal** bearing USN: **1BM20IS074, 1BM20IS061 and 1BM20IS066** in partial fulfilment of the requirements for the IV Semester degree in **Bachelor of Engineering in Information Science & Engineering** of **Visvesvaraya Technological University, Belgaum** as a part of project for the course **UNIX System Programming and 19IS4PWUSP** during academic year 2021-2022.

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ABSTRACT

This report is a documentation of our project 'Product Management System'. We utilised the bash shell along with bash commands to allow the administrator/manager to manage their inventory in an efficient manner while keeping the interface we have created interactive and easy-to-use.

Through this project, our core skills in Unix System Programming have been honed and our understanding of the concepts involved have been strengthened. We use the understanding of a database management system and shell scripting to replicate the functionality of the former using the latter.

INTRODUCTION

The Product Management System has been implemented by shell scripting to provide functionality such as adding products, viewing products, deleting products and editing products. These functions allow the user to keep track of the inventory of whatever their product line is.

Under the add products function, we can add fields like product name, category, quantity and price. We use the return function to check if the user has finished their input and clicked enter, following which the input is displayed for confirmation from the user.

We have used shell scripting as it is simple and efficient. It is useful when we have a system with multiple repeated steps such as ours.

To create the functionality of a database management system, we have used LDB which is a lightweight database file, which acts as a schema-less database to store the records given by the user.

PROBLEM STATEMENT

Using a traditional database system, we require a lot of different tools to implement a product management system, like MySQL, a front-end for interaction with the user and a connection between a front-end and the back-end. The same functionality can be implemented using shell scripting in a much more efficient way, and without the need for any additional software at all, and by using the BASH shell only.

So in our project we try to replicate the functionality of a traditional database management system using shell scripting.

APPLICATION PROGRAM INTERFACES (APIs) USED

1. LDB
2. sleep ()
3. exit ()
4. chmod

APPLICATION PROGRAM INTERFACES (APIs) - EXPLANATION

- **ldb**

  ldb is a lightweight embedded database library and API. It is schemaless and doesn't require any database daemon. ldb function calls are processed immediately by the ldb library, which does IO directly on the database, while allowing multiple readers/writers using operating system byte range locks. This leads to an API with very low overheads, often resulting in speeds of more than 10x what can be achieved with a more traditional LDAP architecture.

  record_file="productrec.ldb"

  Here, a schemaless database has been created to store the product records in one place.

- **sleep()** sleep() causes the calling thread to sleep either until the number of real-time seconds specified in seconds have elapsed or until a signal arrives which is not ignored. It is a system call api.

  sleep 1

  Here, a delay is caused for 1 second.

- **exit()**

  This function terminates the process immediately.

- **chmod**

  changes the access permissions of a file (File APIs).

  chmod +x products.sh

  Here, we ensure that the script is executable.

IMPLEMENTATION

Bash Shell Script

```
# Unix product inventory project
#!/bin/bash menu_choice=""
record_file="productrec.ldb"
temp_file=/tmp/ldb.$$ touch $temp_file;
chmod 644 $temp_file trap 'rm -f
$temp_file' EXIT



get_return()
{
        printf '\tClick Enter\n'
read x return 0 }

get_confirm()
{
        printf '\tAre you sure?\n'
        while true do
          read x case "$x"
        in
        y|yes|Y|Yes|YES
        ) return 0;;
        n|no|N|No|NO)
        printf '\ncancelled\n'
                return 1;;
            *) printf 'Please enter yes or no';;
esac done }
```

```
set_menu_choice()
{
        clear printf '\nMenu:-' printf '\n' printf '\ta) Add new
product records\n' printf '\tb) Find product\n' printf '\tc) Edit
product\n' printf '\td) Remove product\n' printf '\te) View
products\n' printf '\tf) Quit\n' printf 'Please enter your choice
and then press enter\n' read menu_choice return }

insert_record()
{ echo $* >>$record_file
return }

add_products()
{

        printf 'Enter product category:-'
        read tmp
        Cat=${tmp%%,*}

        printf 'Enter product name:-'
        read tmp
        Name=${tmp%%,*}

        printf 'Enter MRP:-'
        read tmp
        MRP=${tmp%%,*}

        printf 'Enter Quantity:-'
        read tmp
        QTY=${tmp%%,*}
```

```
        #Check that the user wants to add info
        printf 'About to add new entry\n' printf
        "$Cat\t$Name\t$MRP\t$QTY\n"

        #If confirmed,append it to the record file if
        get_confirm; then insert_record $Cat:$Name-Rs.
        $MRP [ Qty=$QTY ]
        fi

        return
}

find_products()
{ echo "Enter product name to find:" read
          product2find grep $product2find
          $record_file> $temp_file

          linesfound=`cat $temp_file|wc -l`
          case `echo $linesfound` in
          0)    echo "Sorry, nothing
        found" get_return return 0
                ;;
          *)    echo "Found the following"
cat $temp_file get_return return 0 esac
return }

remove_products()
{ linesfound=`cat $record_file|wc -l`

          case `echo $linesfound` in
          0)    echo "Sorry, nothing
                found\n" get_return
                return 0;;
```

```
;;
            *)    echo "Found the following\n" cat
          $record_file ;; esac printf "Type the product name
          you want to delete\n" read searchstr

           if [ "$searchstr" = "" ]; then
              return 0
            fi
           grep -v "$searchstr" $record_file> $temp_file
           mv $temp_file $record_file printf
"Product has been removed\n" get_return
return }

view_products()
{
          printf "List of products are:\n"
cat $record_file get_return return }



edit_products()
{
          printf "List of products are:\n" cat $record_file printf
          "Type the name of the product you want to edit\n" read
          searchstr if [ "$searchstr" = "" ]; then return 0
            fi
            grep -v "$searchstr" $record_file> $temp_file
          mv $temp_file $record_file printf "Enter the
          new record\n" add_products
}

rm -f $temp_file if [!-f
$record_file];then touch $record_file
#creates empty file fi
```

```
clear printf
'\n\n\n'
printf '***Product Management***'
sleep 1

quit="n" while [
"$quit" != "y" ];
do

set_menu_choice case
"$menu_choice" in
a) add_products;;
b) find_products;;
c) edit_products;;
d) remove_products;;
e) view_products;;
f) quit=y;;*) printf "Sorry, invalid choice.";; esac done #end rm -f $temp_file echo
   "Finished"

exit 0
```

Command Line Script

```
$gedit product.sh

$./product.sh
```

RESULTS

Kali-Linux-2021.2-virtualbox-amd64 [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

product.sh (~) - gedit qterminal

Open product.sh

```
47          return
48  }
49
50  insert_record()
51  {
52          echo $* >>$record_file
53          return
54  }
55
56  add_products()
57  {
58
59          printf 'Enter product category:-'
60          read tmp
61          Cat=${tmp%%,*}
62
63          printf 'Enter product name:-'
64          read tmp
65          Name=${tmp%%,*}
66
67          printf 'Enter MRP:-'
68          read tmp
69          MRP=${tmp%%,*}
70
71          printf 'Enter Quantity:-'
72          read tmp
73          QTY=${tmp%%,*}
74
75          #Check that the user wants to add info
76          printf 'About to add new entry\n'
77          printf "$Cat\t$Name\t$MRP\t$QTY\n"
78
79          #If confirmed,append it to the record file
80          if get_confirm; then
81          insert_record $Cat:$Name-Rs. $MRP [ Qty=$QTY ]
82          fi
83
84          return
85  }
86
87  find_products()
88  {
89            echo "Enter product name to find:"
90            read product2find
91            grep $product2find $record_file> $temp_file
92
```

Kali-Linux-2021.2-virtualbox-amd64 [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

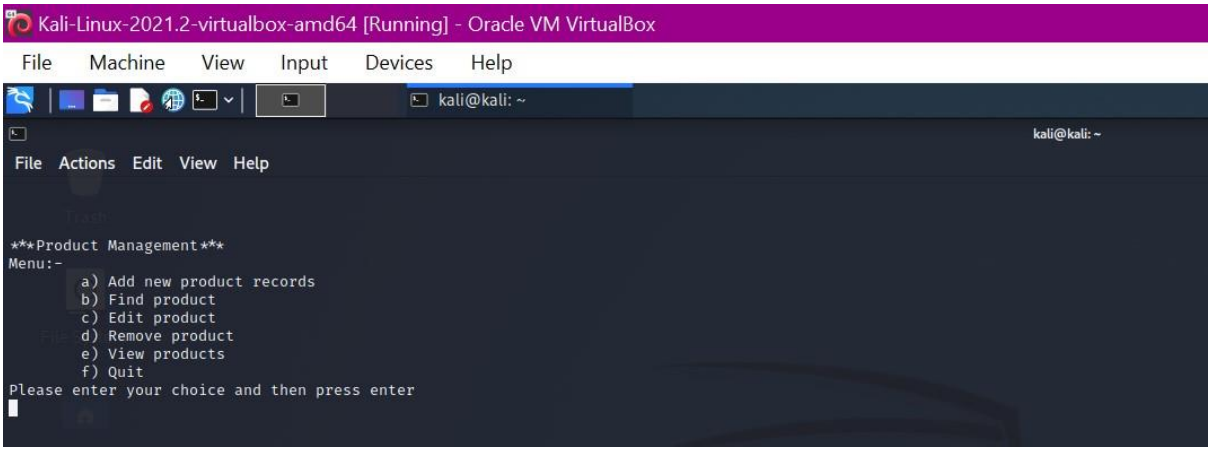
kali@kali: ~

kali@kali: ~

File Actions Edit View Help

```
┌──(kali㉿kali)-[~]
└─$ gedit product.sh
^C

┌──(kali㉿kali)-[~]
└─$ ./product.sh
```




```
Menu:-
        a) Add new product records
        b) Find product
        c) Edit product
        d) Remove product
        e) View products
        f) Quit
Please enter your choice and then press enter
a
Enter product category:-Hygiene
Enter product name:-Toothbrush
Enter MRP:-90
Enter Quantity:-12
About to add new entry
Hygiene Toothbrush      90      12
        Are you sure?
y
```

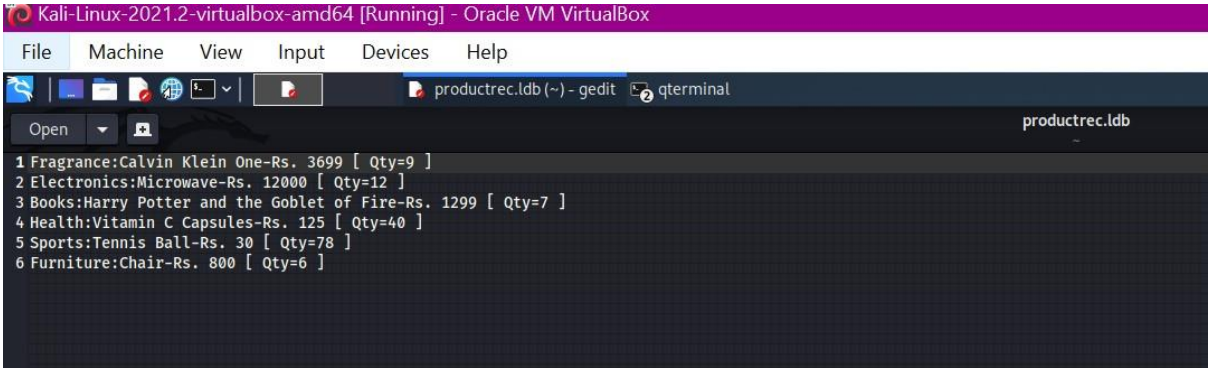
```
Menu:-
        a) Add new product records
        b) Find product
        c) Edit product
        d) Remove product
        e) View products
        f) Quit
Please enter your choice and then press enter
b
Enter product name to find:
Chair
Found the following
Furniture:Chair-Rs. 900 [ Qty=6 ]
        Click Enter
```

```
Menu:-
        a) Add new product records
        b) Find product
        c) Edit product
        d) Remove product
        e) View products
        f) Quit
Please enter your choice and then press enter
c
List of products are:
Furniture:Chair-Rs. 900 [ Qty=6 ]
Fragrance:Calvin Klein One-Rs. 3699 [ Qty=9 ]
Electronics:Microwave-Rs. 12000 [ Qty=12 ]
Home:Cushions-Rs. 799 [ Qty=66 ]
Books:Harry Potter and the Goblet of Fire-Rs. 1299 [ Qty=7 ]
Health:Vitamin C Capsules-Rs. 125 [ Qty=40 ]
Women's Fashion:Mini Skirt-Rs. 2999 [ Qty=3 ]
Sports:Tennis Ball-Rs. 30 [ Qty=78 ]
Hygiene:Toothbrush-Rs. 90 [ Qty=12 ]
Type the name of the product you want to edit
Chair
Enter the new record
Enter product category:-Furniture
Enter product name:-Chair
Enter MRP:-800
Enter Quantity:-6
About to add new entry
Furniture       Chair   800     6
        Are you sure?
y
```

```
Menu:-
        a) Add new product records
        b) Find product
        c) Edit product
        d) Remove product
        e) View products
        f) Quit
Please enter your choice and then press enter
d
Found the following

Fragrance:Calvin Klein One-Rs. 3699 [ Qty=9 ]
Electronics:Microwave-Rs. 12000 [ Qty=12 ]
Home:Cushions-Rs. 799 [ Qty=66 ]
Books:Harry Potter and the Goblet of Fire-Rs. 1299 [ Qty=7 ]
Health:Vitamin C Capsules-Rs. 125 [ Qty=40 ]
Women's Fashion:Mini Skirt-Rs. 2999 [ Qty=3 ]
Sports:Tennis Ball-Rs. 30 [ Qty=78 ]
Hygiene:Toothbrush-Rs. 90 [ Qty=12 ]
Furniture:Chair-Rs. 800 [ Qty=6 ]
Type the product name you want to delete
Toothbrush
Product has been removed
        Click Enter
```

```
Menu:-
        a) Add new product records
        b) Find product
        c) Edit product
        d) Remove product
        e) View products
        f) Quit
Please enter your choice and then press enter
e
List of products are:
Fragrance:Calvin Klein One-Rs. 3699 [ Qty=9 ]
Electronics:Microwave-Rs. 12000 [ Qty=12 ]
Books:Harry Potter and the Goblet of Fire-Rs. 1299 [ Qty=7 ]
Health:Vitamin C Capsules-Rs. 125 [ Qty=40 ]
Sports:Tennis Ball-Rs. 30 [ Qty=78 ]
Furniture:Chair-Rs. 800 [ Qty=6 ]
        Click Enter
```



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