EXP-9 *20.12.2021* **MASK VENDING MACHINE MANAGEMENT SYSTEM IN C++**

AIM:

To implement a mask vending machine management with functions for both a user and an administrator using file handling and inheritance.

REPORT:

The main objective of this program is to create a system which makes easier and quicker availability and acquirement of face masks. This system is effective for this COVID-19 situation.

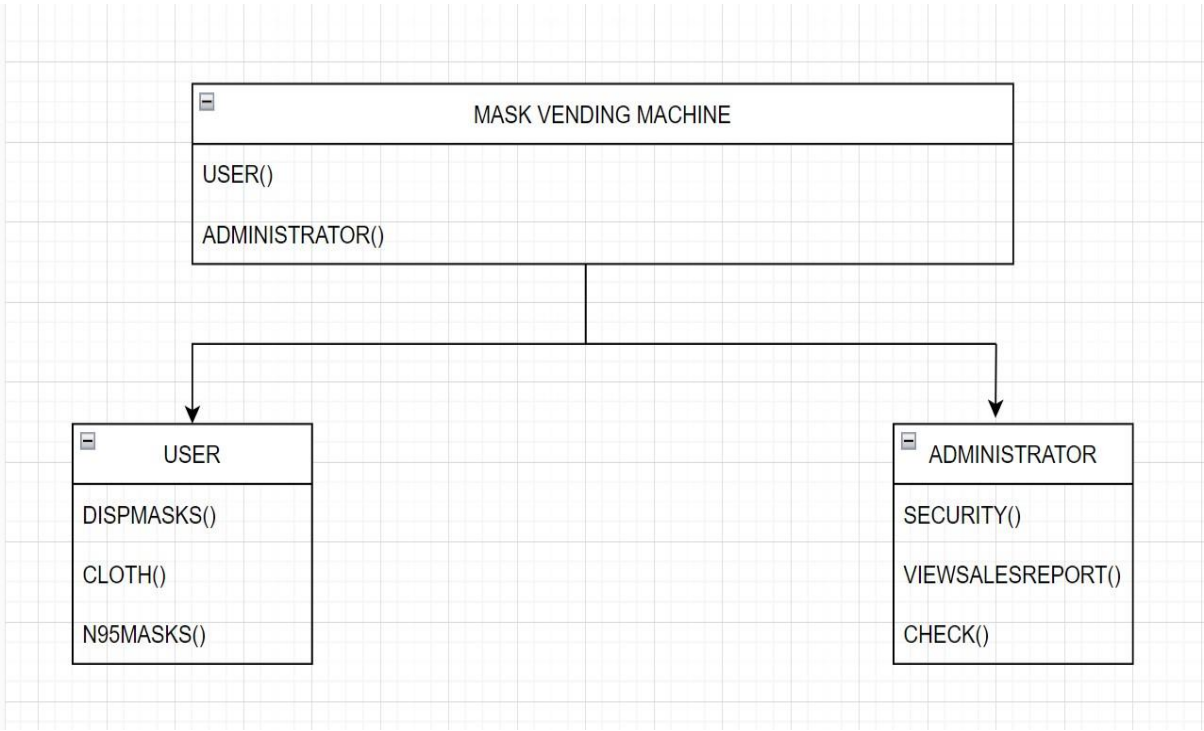
The user can select their choice of masks from the available options. An option of acquiring customized masks are available where the user can obtain face mask with their desired text printed on them.

Hierarchical inheritance is used in this program with vending machine as the base class and user, administrator as the respective derived class. This type of inheritance is used since, the objects of the class vending machine is inherited to the classes user and administrator.

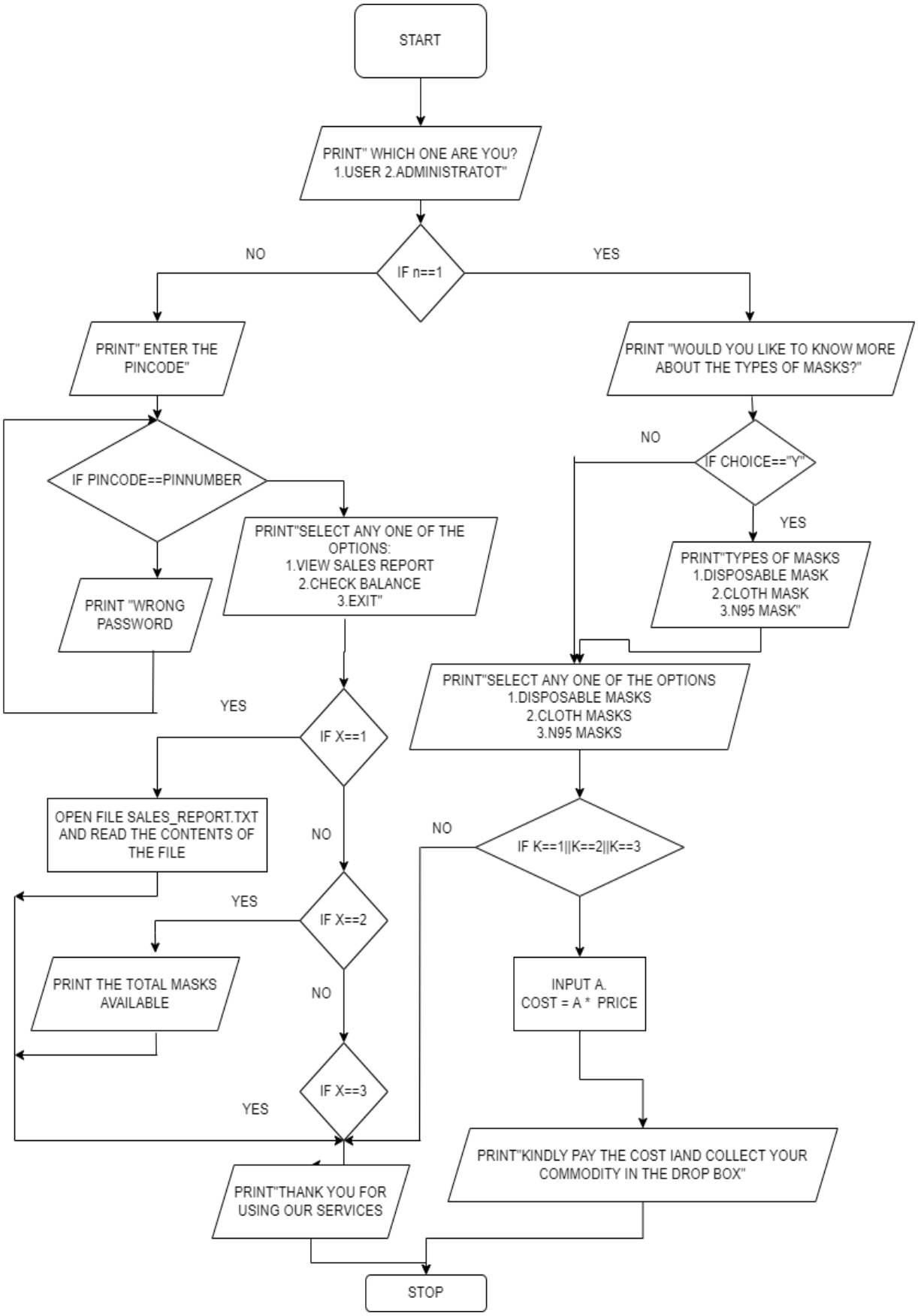
File handling is used to store the sales report in a text file 'salesreport' which can be accessed by the administrator. The functions of the administrator are password protected. The administrator can also check the availability of the masks in order to refill them. The average sales for a month can also be predicted using the sales report and the masks can restored in respect to the sales percentage.

CLASS DIAGRAM:

The following diagram is the class representation of the mask vending machine management.



FLOW DIAGRAM:



SOURCE CODE:

```
//mask vending machine management
#include<iostream>
#include<fstream>
#include<string.h>
#include<ctime>
using namespace std;
class vending_machine
{
     protected:
                    int w,cost,totdisp,totcloth,totnh,y,bill;
                    string gain;
                    int numc,numn,j,pricec,pricen,total;
                    char name[20][20];
                    int p,pinNumber;
                    int InputPinNumber;
            bool isPinInvalid;
            int RetryCount;
            char str[200];
             fstream vmout;
            fstream vmin;
  time_t now = time(0);
  char* dt = ctime(&now);
};

class user : public vending_machine
{
          public:
                    void disp();
                    void cloth();
                    void nh();

};
void user :: disp()
{
                              vmout.open("sales_report.txt",ios::out|ios::app);
                              cout<<"how many masks would you like to buy?"<<endl;
                              cin>>w;
                              totdisp=200;
                              totdisp=totdisp-w;
                              cost=5*w;
                              vmout<<"\npurchased items: "<<w<<" disposable masks"<<endl;
                              vmout<<"the cost of your purchase is: Rs."<<cost<<"/-"<<endl;
                              vmout << dt;
                              vmout<<"----------------------------------------------------------------"<<endl;
                              cout<<"purchased items: "<<w<<" disposable masks"<<endl;
                              cout<<"the cost of your purchase is: Rs."<<cost<<"/-"<<endl;
                              cout<<"kindly insert the coins and collect your commodity at the drop
box"<<endl;
                              cout<<"\t~~thank you for using our services~~"<<endl;
                              cout<<"\t~wear masks and stay safe~";
```

```
                }
void user :: cloth()
                {
                        cout<<"how many cloth masks and customized cloth masks would you like
to buy?"<<endl;
                        cout<<"no.of cloth masks: "<<endl;
                        cin>>numc;
                        totcloth=200;
                        totcloth=200-numc;
                        cout<<"no.of customized masks: "<<endl;
                        cin>>numn;
                        totcloth-=numn;
                        for(j=1;j<=numn;j++)
                        {
                        cout<<"enter the text to be printed in your customized
mask"<<j<<":"<<endl;
                       cin>>name[j];}
                        pricec=10*numc;
                        pricen=15*numn;
                       total=pricec+pricen;
                        vmout<<"\npurchased items:\n"<<numn<<" cloth
masks\n"<<numc<<"customized cloth masks"<<endl;
                        vmout<<"the total cost of your purchase is: Rs."<<total<<"/-"<<endl;
                        vmout << dt;
                        vmout<<"----------------------------------------------------------------"<<endl;
                        cout<<"purchased items:\n"<<numn<<" cloth
masks\n"<<numc<<"customized cloth masks"<<endl;
                        cout<<"the total cost of your purchase is: Rs."<<total<<"/-"<<endl;
                        cout<<"kindly insert the coins and collect your commodity at the drop
box"<<endl;
                        cout<<"\t~~thank you for using our services~~"<<endl;
                        cout<<"\t~wear masks and stay safe~";}
void user:: nh()
{
                        cout<<"how many masks would you like to buy?"<<endl;
                        cin>>y;
                        totnh=200;
                        totnh=totnh-y;
                        bill=20*y;
                        vmout<<"\npurchased items: "<<y<<" N95 masks"<<endl;
                        vmout<<"the cost of your purchase is: Rs."<<bill<<"/-"<<endl;
                        vmout <<dt;
                        vmout<<"----------------------------------------------------------------"<<endl;
                        cout<<"purchased items: "<<y<<" N95 masks"<<endl;
                        cout<<"the cost of your purchase is: Rs."<<bill<<"/-"<<endl;
                        cout<<"kindly insert the coins and collect your commodity at the drop
box"<<endl;
                        cout<<"\t~~thank you for using our services~~"<<endl;
                        cout<<"\t~wear masks and stay safe~";
                        vmout.close();}
```

```
class admin : public vending_machine
{
	public:
		bool security();
		void sales();
		void change();
		void count();
		void exit();};
bool admin :: security()
{
pinNumber = 12345;
RetryCount = 3;
InputPinNumber = -1;
isPinInvalid =true;
	while (isPinInvalid && RetryCount) {

		cout << "Enter the pin code: ";
		cin >> InputPinNumber;

		if (InputPinNumber == pinNumber) {
			isPinInvalid = false;
		}
		else {
			RetryCount--;
			if(RetryCount)
				cout << "Invalid pin code ! Try again." << endl;
			else
			{
				cout << "Your Account is Locked! 3 retry Reached! Try After some
time." << endl;
				return false;}}}
	return true;
}
void admin::sales()
{
	cout<<"The sales report";
	vmin.open("sales_report.txt",ios::in);
	while(!vmin.eof())
	{
		vmin.getline(str,200);
		cout<<str<<endl;}
	vmin.close();
}
void admin::count()
{
	cout<<"No.of disposable masks available: "<<totdisp<<endl;
	cout<<"No.of cloth masks available: "<<totcloth<<endl;
	cout<<"No.of N95 masks available: "<<totnh<<endl;
}
int main (void)
{
```

```
char str1[20] = "y";
  char str2[20] = "Y";
  char choice[20];
   string again = "y";
   string repeat = "y";
   int k1,k2,k;
          int n,x;
          user u;
          admin a;
          cout<<"\t\t\t\t~WELCOME~"<<endl;
          cout<<"\tWhich one of the following are you?\n1.user\t2.administrator"<<endl;
          cout<<"Your option is: "<<endl;
          cin>>n;
          switch(n)
                    {
                              case 1:
                                        cout<<"Do you like to know about the type of masks and their
benefits(y/n)?"<<endl;
                                        cin>>choice;
                                        k1 = strcmp(str1, choice);
              k2 = strcmp(str2, choice);
              if (k1 == 0 || k2==0)
              {
                                        cout<<"\t~TYPES OF MASKS~"<<endl;
                                        cout<<"1.Disposable masks\n2.Cloth masks\n3.N95 masks"<<endl;
                                        cout<<"DISPOSABLE MASKS:\n\t*disposable masks are for one time
use only.\n";
                                        cout<<"\t*cost of a disposable mask is Rs.5/-"<<endl;
                                        cout<<"CLOTH MASKS:\n\t*cloth masks can be reused."<<endl;
                                        cout<<"\t*cloth masks can be customized with printed
names"<<endl;
                                        cout<<"\t*cost of a cloth mask is Rs.10/-"<<endl;
                                        cout<<"\t*cost of a customized cloth mask is Rs.15/-"<<endl;
                                        cout<<"N95 MASKS:\n\t*N95 masks are for one time use only.\n";
                                        cout<<"\t*these masks are the most safest and are clinically
suggested type."<<endl;
                                        cout<<"\t*cost of a N95 mask is Rs.20/-"<<endl;
                                        goto option; }
                              else{
                                        goto option;
                                   }
                              option:
            while( again == "y" || again == "Y")
            {
                                        cout<<"select any one of the following options:"<<endl;
                                        cout<<"1.Disposable masks\n2.Cloth masks\n3.N95
masks\n4.Exit"<<endl;
                                        cout<<"your selection is: "<<endl;
                                        cin>>x;
                                        switch(x)
                                        {
```

```
                                        case 1:
                                                u.disp();
                                                break;
                                        case 2:
                                                u.cloth();
                                                break;
                                        case 3:
                                                u.nh();
                                                break;
                                        case 4:
                                                cout<<"*thank you for using our services*";
                                                exit(0);
                                        default:
                                                cout<<"invalid data";
                                                break;
                                }
                           cout << "\nWould you like to go again? (Y/N)" << endl;
        cin >> again;}
                        case 2:
                                while( again == "y" || again == "Y")
                                {
                                        a.security();
                                cout<<"select any one of the following options:"<<endl;
                                cout<<"1.View sales report\n2.View mask count\n3.Exit"<<endl;
                                cout<<"Your selection is: "<<endl;
                                cin>>k;
                                switch(k)
                                {
                                        case 1:
                                                a.sales();
                                                break;
                                        case 2:
                                                a.count();
                                                break;
                                                case 3:
                                                        cout<<"*thank you for using our services*";
                                                        exit(0);
                                        default:
                                                cout<<"invalid data";
                                                break;}
                          cout << "Would you like to go again? (Y/N)" << endl;
        cin >> repeat;}
                        cout<<"thank you!! visit again";
                                break;
                        default:
                                cout<<"\ninvalid option";
                                break;}
return 0;
}
```

Code done by:
Vaisunavi.G II ECE-C.

OUTPUT:

```
A:\software\dec21.exe
        Which one of the following are you?
1.user  2.administrator
Your option is:
2
Enter the pin code: 12345
select any one of the following options:
1.View sales report
2.View mask count
3.Exit
Your selection is:
1
The sales reportpurchased items: 1 disposable masks
the cost of your purchase is: Rs.5/-
Thu Dec 23 17:35:52 2021
------------------------------------------------------------------
purchased items: 0 cloth masks
1customized cloth masks
the total cost of your purchase is: Rs.10/-
Thu Dec 23 17:35:52 2021
------------------------------------------------------------------
purchased items: 1 disposable masks
the cost of your purchase is: Rs.5/-
Thu Dec 23 17:40:13 2021
------------------------------------------------------------------
purchased items: 2 disposable masks
the cost of your purchase is: Rs.10/-
Thu Dec 23 17:49:41 2021
------------------------------------------------------------------
purchased items:
2 cloth masks
2customized cloth masks
the total cost of your purchase is: Rs.50/-
Thu Dec 23 17:49:41 2021
------------------------------------------------------------------
purchased items: 1 N95 masks
the cost of your purchase is: Rs.20/-
Thu Dec 23 17:49:41 2021
------------------------------------------------------------------

Would you like to go again? (Y/N)
Y
Enter the pin code: 12345
select any one of the following options:
1.View sales report
2.View mask count
3.Exit
Your selection is:
3
*thank you for using our services*
--------------------------------
Process exited after 15.25 seconds with return value 0
Press any key to continue . . .
```

RESULT:

The program has been executed successfully and the output has been verified.