

Final Assignment(c++)

by Aung Tun Lin

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COS212 Assignment

Assigned To: Teacher Ei Ei
Khint Myint

Assigned By: Aung Tun Lin

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Introduction On C++ Assignment

In this Assignment, Task1-I/O Manipulation that contains file name i.e., product file that contain four kinds of output processing named (name of the product, Product ID, Product Category, Quantity on Hand). Furthermore, there are three categories of product: Electronics, Household and Furniture which will come under the processing output of Product Category. Another part of this Assignment is Task2-Inheritance that contain the explanation of Inheritance Concept, the aid diagram and explaining how Inheritance between classes can be applied in the “Product File” that has already created in Task1. The last part of Output Process is theTask3-Ploymorphism that contain explanation of Polymorphism Concept with the help of aid diagram and implementation of C++ classes in “Product File” that has already created in Task1.

Task1-I/O File Manipulation(Coding Page)

```
#include<iostream> //input and output screen
#include<string.h> //present different character
#include<fstream> //read and write a file
#include<stdlib.h> //exist data
using namespace std; //compiler
char found='f';
class product//class declaration
{
private:
    char prname[25];
    char prid[25];
    char prcate[25];
    int prqty;
public://used from main
    void getdata()// void is used for no return values
    {
        cout<<"Enter name of the product: ";//output
        cin>>prname;//input
        cout<<"Enter product ID: ";
        cin>>prid;
        cout<<"Enter product category(Electronics,Household,Furniture): ";
        cin>>prcate;
        cout<<"Enter Quantity On Hand:";
        cin>>prqty;
    }
    void showdata()
    {
        cout<<prname<< " <<prid<< " <<prcate<< " <<prqty<<endl;
    }
    void modifydata()
    {
        char name[25];
        char categ[25];
        int qty;
        cout<<"Enter the new data."<<endl;
        cout<<"Enter the name: ";
        cin>>name;
        cout<<"Enter the category: ";
        cin>>categ;
        cout<<"Enter the quantity: ";
        cin>>qty;
        //strcpy(prid,id);
        strcpy(prname,name);//copy characters to source destination
        strcpy(prcate,categ);
        prqty=qty;
    }
    int compareid(char id[25])//comapare values
    {
        if(strcmp(prid,id)==0)//calling whith parameters
        {
            return 1;
        }
        else
        {
            return 0;
        }
    }
};
```

```
int main()//all the programs start here
{
    product p1,p2,p3;//Object Declaration
    int choice, i ,count=0;
    char result;//result for process
    cout<<"Main Menu\n"<<endl;
    cout<<"1. Add a new product to the file:"<<endl;
    cout<<"2. Modifies the details of an existing product:"<<endl;
```

This first two page is Task1-I/O Manipulation coding in which the product of class was declared with Private specifier with the four-variable shown in the first snap. Public Class specifier is being used by void function (get data, show data, modify data) to insert output and input variable to be seen in the program. In the void (Modify data), uses string character and integer quantity that has already declared in private specifier class for its outcome. Besides that, it has declared string copy of characters within parameters to source its destination. For the integer we compare values.

```
int main()//all the programs start here
{
    product p1,p2,p3;//Object Declaration
    int choice, i ,count=0;
    char result;//result for process
    cout<<"Main Menu\n"<<endl;
    cout<<"1. Add a new product to the file:"<<endl;
    cout<<"2. Modifies the details of an existing product:"<<endl;
    cout<<"3. Displays the product details from the file:"<<endl;
    cout<<"4. Exit:"<<endl;
    cout<<"Choose the one(1-4): ";
    cin>>choice;
    do{
        if(choice==1)
        {
            ofstream fio("Product.dat",ios::out);//to create and write the information file
            if(fio.is_open())//open file
            {
                do{
                    p1.getdata();//take data from getdata function
                    fio.write((char*)&p1,sizeof(p1));
                    count++;
                    cout<<"Record is added to the file.:\\n";
                    cout<<"Would you like to add more(y/n)? : ";
                    cin>>result;
                }while(result=='y'||result=='Y');
            }
            else
            {
                cout<<"You can't open file.:";
            }
            fio.close();//close file
        }
        else if(choice==2)
        {
            char id[25];
            streampos pos;//absolute position within stream
            cout<<"Enter product ID that you want to modify: ";
        }
    }
```

In Integer Main function, it is also used (do loop) mechanism for its looping until the user satisfy its implementing

the new data in the output. In the snap it also used to open file, take data from the previous get data and close file. The file name is "Procut.dat"

This is the third page in which integer main function is used to execute the program. In the main function, object was declared with the different variable not similar to class specifier variable to put a new data for the Add, Display and Modify Product.

```
char id[25];
streampos pos;//absolute position within stream
cout<<"Enter product ID that you want to modify: ";
cin>>id;
fstream in_out("Product.dat",ios::in|ios::out|ios::binary);//open operations for input,output and binary
in_out.seekg(0)//operate pointer from the top
if(in_out.is_open())
    while(!in_out.eof())//process until the end of Line
    {
        pos=in_out.tellg();//get positon
        in_out.read((char*)&p3,sizeof(p3));
        if(p3.compare(id)==1)
        {
            p3.showdata();//get data from showdata function
            p3.modifydata();//get data from modifydata function
            in_out.seekp(pos);//put data
            in_out.write((char*)&p3,sizeof(p3));
            found=true;
            cout<<"Successfully modified.:";
            break;
        }
    }
    if(found=='f')
    {
        cout<<"Product ID is not found in the file.:\\n";
        cout<<"Press any key to exist : ";
        exit(1);
    }
    in_out.close();
}
else if(choice==3)
{
    ifstream infile;//to read the file
    i=1;//to store record 1
    infile.open("Product.dat",ios::in);//read value and return file
    while(!infile.eof()&&i<=count)
    {
        infile.read((char*)&p2,sizeof(p2));//read file
    }
}
```

```

else if(choice==3)
{
    ifstream infile;//to read the file
    i=1;//to store record 1
    infile.open("Product.dat",ios::in);//read value and return file
    while(!infile.eof()&&i<=count)
    {
        infile.read((char*)&p2,sizeof(p2));//read file
        p2.showdata();
        i++;
    }
    infile.close();//close file
}
else
{
    cout<<"This is the end of program.:";
    exit(2);
}
cout<<"Do you want to do more process?";
cout<<"Choose(1-4):";
cin>>choice;
}while(choice>=1 && choice<=4);
return 0;//execution program end here
}

```

In this snap consist of using do while loop and the return to Main menu and to execute the Program.

Task1-I/O File Manipulation(Output Screen)

```

C:\Users\User\Desktop\COS212 Assignment\Test1.exe
Main Menu

1. Add a new product to the file:
2. Modifies the details of an existing product:
3. Displays the product details from the file:
4. Exit:
Choose the one(1-4):

```

This is the first output screen of program that will come after compile and run in Dev C++ after the debugging all the code. This code consists “Main Menu” as a title by following lists:

- Add new product to the file
- Modifies the details of an existing product
- Display the product details from the file
- Exit

Note: At the bottom there is an option from (1-4): in which the user can choose any number given in the output screen to Add, Modify, display a product and exit from the output screen.

```
C:\Users\User\Desktop\COS212 Assignment\Test1.exe
Main Menu

1. Add a new product to the file:
2. Modifies the details of an existing product:
3. Displays the product details from the file:
4. Exit:
Choose the one(1-4): 1
Enter name of the product: steel
Enter product ID: P26916
Enter product category(Electronics,Household,Furniture): Electronics
Enter Quantity On Hand:3
Record is added to the file.:
Would you like to add more(y/n)? : y
Enter name of the product: alloy
Enter product ID: P26917
Enter product category(Electronics,Household,Furniture): Household
Enter Quantity On Hand:4
Record is added to the file.:
Would you like to add more(y/n)? : n
Do you want to do more process?Choose(1-4):-
```

In this output screen the user chooses the option 1 to add a new product to the file.

- 1.The user add the “steel” in the name of the product.
- 2.By following, the user adds the Product ID “P26916” in the second one.
- 3.The user add the Product Category named “Electronics” in the third one.
- 4.The user add “3” in the Quantity on Hand in the fourth one. Then the product is added to the file and so on.

Note: If the user writes yes “Would you like to add more(y/n)” in the output program screen the program will ask the user to add a new product. Whereas, if the user writes no then the program will directly move to Main Menu.

```
C:\Users\User\Desktop\COS212 Assignment\Test1.exe
Main Menu

1. Add a new product to the file:
2. Modifies the details of an existing product:
3. Displays the product details from the file:
4. Exit:
Choose the one(1-4): 1
Enter name of the product: steel
Enter product ID: P26916
Enter product category(Electronics,Household,Furniture): Electronics
Enter Quantity On Hand:3
Record is added to the file.:
Would you like to add more(y/n)? : y
Enter name of the product: alloy
Enter product ID: P26917
Enter product category(Electronics,Household,Furniture): Household
Enter Quantity On Hand:4
Record is added to the file.:
Would you like to add more(y/n)? : n
Do you want to do more process?Choose(1-4):3
steel P26916 Electronics 3
alloy P26917 Household 4
Do you want to do more process?Choose(1-4):
```

In this output the user has already added the new product record to the file. After the user choose the option 3 which is basically the displaying the product details that user has added in the Product File. The records are steel, P26916, Electronics and 3 etc.

```
C:\Users\User\Desktop\COS212 Assignment\Test1.exe
Main Menu

1. Add a new product to the file:
2. Modifies the details of an existing product:
3. Displays the product details from the file:
4. Exit:
Choose the one(1-4): 1
Enter name of the product: steel
Enter product ID: P26916
Enter product category(Electronics,Household,Furniture): Electronics
Enter Quantity On Hand:3
Record is added to the file.:
Would you like to add more(y/n)? : y
Enter name of the product: alloy
Enter product ID: P26917
Enter product category(Electronics,Household,Furniture): Household
Enter Quantity On Hand:4
Record is added to the file.:
Would you like to add more(y/n)? : n
Do you want to do more process?Choose(1-4):3
steel P26916 Electronics 3
alloy P26917 Household 4
Do you want to do more process?Choose(1-4):2
Enter product ID that you want to modify: P26917
alloy P26917 Household 4
Enter the new data.
Enter the name: asbestos
Enter the category: furniture
Enter the quantity: 5
Successfully modified.:Do you want to do more process?Choose(1-4):
```

In this output program screen the user chooses the option 2 to modify the data that has recorded and display in the file .The user Modify the Product ID by entering the new name of the product, quantity and the category of the existing file. The user enter asbestos in the new product, furniture in the new category and 5 in the new amount of quantity.

In this output screen the program displaying a modified product by choosing the option 3 from Main Menu. It display steel P26916 Electronics 3 in the first line. Another display is asbestos P26917 furniture 5 in the second line.

```
C:\Users\User\Desktop\COS212 Assignment\Test1.exe
Main Menu

1. Add a new product to the file:
2. Modifies the details of an existing product:
3. Displays the product details from the file:
4. Exit:
Choose the one(1-4): 1
Enter name of the product: steel
Enter product ID: P26916
Enter product category(Electronics,Household,Furniture): Electronics
Enter Quantity On Hand:3
Record is added to the file.:
Would you like to add more(y/n)? : y
Enter name of the product: alloy
Enter product ID: P26917
Enter product category(Electronics,Household,Furniture): Household
Enter Quantity On Hand:4
Record is added to the file.:
Would you like to add more(y/n)? : n
Do you want to do more process?Choose(1-4):3
steel P26916 Electronics 3
alloy P26917 Household 4
Do you want to do more process?Choose(1-4):2
Enter product ID that you want to modify: P26917
alloy P26917 Household 4
Enter the new data.
Enter the name: asbestos
Enter the category: furniture
Enter the quantity: 5
Successfully modified.:Do you want to do more process?Choose(1-4):3
steel P26916 Electronics 3
asbestos P26917 furniture 5
Do you want to do more process?Choose(1-4):
```

```
C:\Users\User\Desktop\COS212 Assignment\Test1.exe
Main Menu

1. Add a new product to the file:
2. Modifies the details of an existing product:
3. Displays the product details from the file:
4. Exit:
Choose the one(1-4): 1
Enter name of the product: steel
Enter product ID: P26916
Enter product category(Electronics,Household,Furniture): Electronics
Enter Quantity On Hand:3
Record is added to the file.:
Would you like to add more(y/n)? : y
Enter name of the product: alloy
Enter product ID: P26917
Enter product category(Electronics,Household,Furniture): Household
Enter Quantity On Hand:4
Record is added to the file.:
Would you like to add more(y/n)? : n
Do you want to do more process?Choose(1-4):3
steel P26916 Electronics 3
alloy P26917 Household 4
Do you want to do more process?Choose(1-4):2
Enter product ID that you want to modify: P26917
alloy P26917 Household 4
Enter the new data.
Enter the name: asbestos
Enter the category: furniture
Enter the quantity: 5
Successfully modified.:Do you want to do more process?Choose(1-4):3
steel P26916 Electronics 3
asbestos P26917 furniture 5
Do you want to do more process?Choose(1-4):4
This is the end of program.:
-----
Process exited after 1242 seconds with return value 2
Press any key to continue . . .
```

This is full programming page in which it shows all the operations starting from “Add a new product from the file to the exit file”. In this output screen the user chooses the option 4 to end the execute program to close the all the file.

Task2-Inheritance

In object-oriented programming, inheritance is among the most crucial ideas. It is simpler to design and manage applications when we can declare a class in terms of another class, thanks to inheritance. Additionally, it allows for quick implementation times and code functionality to reuse. Programmers have the option to specify that a new class should inherit the members of an existing class rather than writing entirely new data members and member functions. The new class is referred to as the derived class, and the current class is known as the base class. In other words, Inheritance is the process by which new classes called derived classes are created from existing classes called base classes. The derived classes have all the features of the base class and the programmer can choose to add new features specific to the newly created derived class.

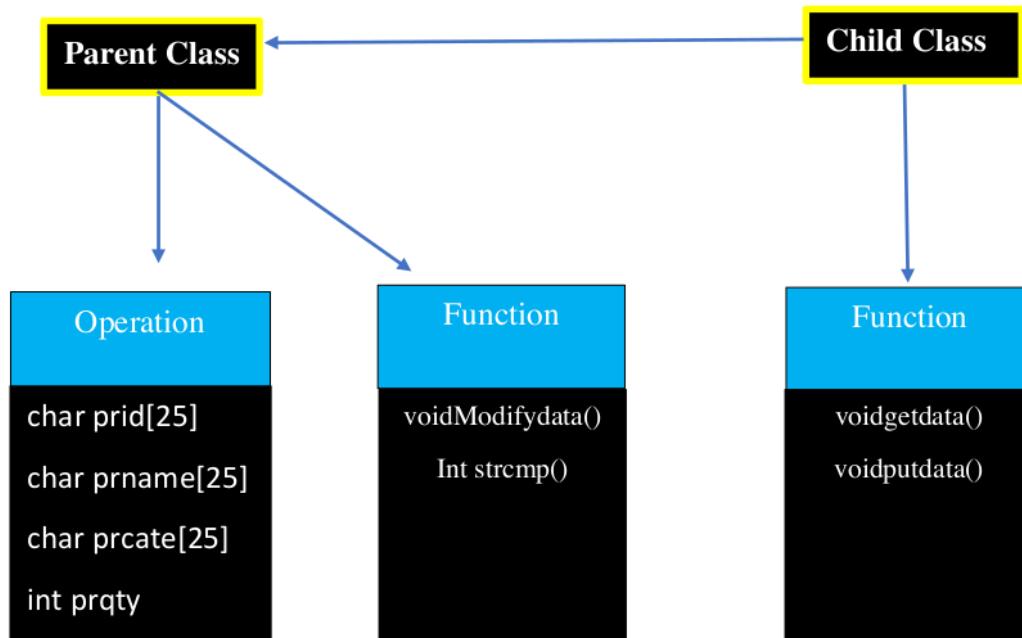
(Anon., 2016).

In a C++ class, the access specifier defines the access control rules. These are:

- Public Specifier
- Private Specifier
- Protected Specifier

There are some points that need to be remember while Using Public, Private and Protected specifier:

- 5
- ❖ A derived class can access the protected and public members (data and functions) of a base class (for all three types of inheritance: public, protected, and private).
 - ❖ Objects of derived classes with private and protected inheritance are not permitted to any data member of a base class that can be accessed.
 - ❖ Only the base class's public members are accessible to objects of derived classes with public inheritance.



Task2-Inheritance(coding page)

The image shows two side-by-side code editors. Both editors have the same file name, "Test2.cpp", at the top. The left editor has a light blue vertical selection bar highlighting lines 10 through 13. The right editor has a red vertical selection bar highlighting lines 34 through 46.

```
Test2.cpp
1 #include<iostream> //input and output screen
2 #include<string.h> //present different character
3 #include<fstream> //read and write a file
4 #include<stdlib.h> //exist data
5 using namespace std; //compiler
6 char found='f';
7 class product //class declaration
8 {
9     protected:
10    char prname[25];
11    char prid[25];
12    char prcate[25];
13    int prqty;
14 public://used from main
15
16    void modifydata()
17    {
18        char name[25];
19        char categ[25];
20        int qty;
21        cout<<"Enter the new data."<<endl;
22        cout<<"Enter the name: ";
23        cin>>name;
24        cout<<"Enter the category: ";
25        cin>>categ;
26        cout<<"Enter the quantity: ";
27        cin>>qty;
28        //strcpy(prid,id);
29        strcpy(prname,name); //copy characters to source destination
30        strcpy(prcate,categ);
31        prqty=qty;
32    }
33    int compareid(char id[25])//comapare values
34    {
35        if(strcmp(prid,id)==0)//calling whith parameters
36        {
37            return 1;
38        }
39    }
}
Test2.cpp
34
35
36
37
38
39
40
41
42
43
44
45
46
47 class Task:public product //declaration of derived class
48 {
49     public:
50         void getdata()
51         {
52             cout<<"Enter name of the product: ";
53             cin>>prname;
54             cout<<"Enter product ID: ";
55             cin>>prid;
56             cout<<"Enter product category(Electronics,Household,Furniture): ";
57             cin>>prcate;
58             cout<<"Enter Quantity On Hand: ";
59             cin>>prqty;
60         }
61         void putdata()
62         {
63             cout<<prname<<" "<<prid<<" "<<prcate<<" "<<prqty<<endl;
64         }
65         void modifydata()
66         {
67             product::modifydata();
68         }
69 }
70 int main()//all the programs start here
71 {
```

This is the first two page of inheritance coding in which the class has declared name product with the protected and public specifier. Void modify data is used for product name [25], category [25] and the quantity. String copy is used to copy the characters and to it source destination. After if function is used there was a declaration of different derived class of variable name “Task” with the public specifier. Void get data, put data and modify data is used to outcome the output result.

```

Test2.cpp
70 int main()//all the programs start here
71 {
72     Task m1,m2,m3;//object declaration
73     int choice, i ,count=0;
74     char result;//for process
75     cout<<"Main Menu\n"<<endl;
76     cout<<"1. Add a new product to the file.:"<<endl;
77     cout<<"2. Modifies the details of an existing product.:"<<endl;
78     cout<<"3. Displays the product details from the file.:"<<endl;
79     cout<<"4. Exit:"<<endl;
80     cout<<"Choose the one(1-4): ";
81     cin>>choice;
82     do{
83         if(choice==1)
84         {
85             ofstream fio("Product.dat",ios::out); //to write in file
86             if(fio.is_open())//open the file
87             {
88                 do{
89                     m1.getdata(); //take data from getdata function
90                     fio.write((char*)&m1,sizeof(m1)); //to write address of t1
91                     count++;
92                     cout<<"Record is added to the file.\n";
93                     cout<<"Would you like to add more(y/n)? : ";
94                     cin>>result;
95                 }while(result=='y'||result=='Y');
96             }
97             else
98             {
99                 cout<<"You can't open file.:";
100            }
101            fio.close(); //close file
102        }
103        else if(choice==2)
104        {
105            char id[25];
106            streampos pos; //store position
107            cout<<"Enter product ID that you want to modify: ";

```

The integer main function is used in this snap. Integer main function is the place where all the programs execute. The object was declared in the main function named Task m1, m2, m3. The character result used for the processing result. Do while loop is used in this snap create the file to write and read the input and output. The variable name m1, m2 and m3 is used with the void function to recall the data function. The name of the file is “Product.dat”

In this snap store function is also used to store the input new data. Addition on it, tell g function is also used to get data and the rest of the explanation is similar on the above page.

```

Test2.cpp
103 else if(choice==2)
104 {
105     char id[25];
106     streampos pos; //store position
107     cout<<"Enter product ID that you want to modify: ";
108     cin>>id;
109     fstream in_out("Product.dat",ios::in|ios::out|ios::binary); //input and output
110     if(in_out.is_open())
111         while(!in_out.eof())
112         {
113             pos=in_out.tellg(); //get data
114             in_out.read((char*)&m3,sizeof(m3)); //read address of t3
115             if(m3.compare(id)==1)
116             {
117                 m3.putdata(); //get data from putdata function
118                 m3.modifydata(); //get data from modifydata function
119                 in_out.seekp(pos); //to put data
120                 in_out.write((char*)&m3,sizeof(m3));
121                 found=true;
122                 cout<<"Successfully modified.:";
123                 break;
124             }
125         }
126         if(found=='f')
127         {
128             cout<<"Product ID is not found in the file.:\\n";
129             cout<<"Press any key to exist : ";
130             exit(1);
131         }
132         in_out.close();
133     }
134     else if(choice==3)
135     {
136         ifstream infile; //to read file
137         i=1;
138         infile.open("Product.dat",ios::in);
139         while(!infile.eof() && i<=count)
140         {
141             infile.read((char*)&m2,sizeof(m3)); //read address of t2
142             m2.putdata();
143             i++;
144         }
145         infile.close(); //to close file
146     }
147     else
148     {
149         cout<<"This is the end of program.:";
150         exit(2);
151     }
152     cout<<"Do you want to do more process?:";
153     cout<<"Choose(1-4):";
154     cin>>choice;
155     }while(choice>1 && choice<=4);
156     return 0; //execution program end here
157 }

```

```

Test2.cpp
122         found=true;
123         cout<<"Successfully modified.:";
124         break;
125     }
126     if(found=='f')
127     {
128         cout<<"Product ID is not found in the file.:\\n";
129         cout<<"Press any key to exist : ";
130         exit(1);
131     }
132     in_out.close();
133 }
134 else if(choice==3)
135 {
136     ifstream infile; //to read file
137     i=1;
138     infile.open("Product.dat",ios::in);
139     while(!infile.eof() && i<=count)
140     {
141         infile.read((char*)&m2,sizeof(m3)); //read address of t2
142         m2.putdata();
143         i++;
144     }
145     infile.close(); //to close file
146 }
147 else
148 {
149     cout<<"This is the end of program.:";
150     exit(2);
151 }
152 cout<<"Do you want to do more process?:";
153 cout<<"Choose(1-4):";
154 cin>>choice;
155 }while(choice>1 && choice<=4);
156 return 0; //execution program end here
157 }

```

In this snap recalling that addresses to read the address. The rest is similar to above page. While loop is recalled the return 0 is to end the program.

Task2-Inheritance (output screen)

```
C:\Users\User\Desktop\COS212 Assignment\Test2.exe
Main Menu

1. Add a new product to the file.:
2. Modifies the details of an existing product.:
3. Displays the product details from the file.:
4. Exit:
Choose the one(1-4): -
```

This is the first output screen of program that will come after compile and run in Dev C++ after the debugging all the code. This code consists “Main Menu” as a title by following lists:

- Add new product to the file
- Modifies the details of an existing product
- Display the product details from the file
- Exit

Note: At the bottom there is an option from (1-4): in which the user can choose any number given in the output screen to Add, Modify, display a product and exit from the output screen.

```
C:\Users\User\Desktop\COS212 Assignment\Test2.exe
Main Menu

1. Add a new product to the file.:
2. Modifies the details of an existing product.:
3. Displays the product details from the file.:
4. Exit:
Choose the one(1-4): 1
Enter name of the product: pen
Enter product ID: P7410
Enter product category(Electronics,Household,Furniture): furniture
Enter Quantity On Hand:8
Record is added to the file.
Would you like to add more(y/n)?: y
Enter name of the product: pencil
Enter product ID: P8520
Enter product category(Electronics,Household,Furniture): household
Enter Quantity On Hand:9
Record is added to the file.
Would you like to add more(y/n)?: n
Do you want to do more process?Choose(1-4):-
```

In this output screen the user chooses the option 1 to add a new product to the file.

1.The user add the “pen” in the name of the product.

2.By following, the user adds the Product ID “P7410” in the second one.

3.The user add the Product Category named “Furniture” in the third one.

4.The user add “8” in the Quantity on Hand in the fourth one. Then the product is added to the file and so on.

Note: If the user writes yes “Would you like to add more(y/n)” in the output program screen the program will ask the user to add a new product. Whereas, if the user writes no then the program will directly move to Main Menu.

```
C:\Users\User\Desktop\COS212 Assignment\Test2.exe
```

```
Main Menu
```

```
1. Add a new product to the file.:  
2. Modifies the details of an existing product.:  
3. Displays the product details from the file.:  
4. Exit:  
Choose the one(1-4): 1  
Enter name of the product: pen  
Enter product ID: P7410  
Enter product category(Electronics,Household,Furniture): furniture  
Enter Quantity On Hand:8  
Record is added to the file.  
Would you like to add more(y/n)? : y  
Enter name of the product: pencil  
Enter product ID: P8520  
Enter product category(Electronics,Household,Furniture): household  
Enter Quantity On Hand:9  
Record is added to the file.  
Would you like to add more(y/n)? : n  
Do you want to do more process?Choose(1-4):3  
pen P7410 furniture 8  
pencil P8520 household 9  
Do you want to do more process?Choose(1-4):
```

In this output the user has already added the new product record to the file. After the user choose the option 3 which is basically the displaying the product details that user has added in the Product File. The records are pen, P7410, Furniture and 8 etc.

```
C:\Users\User\Desktop\COS212 Assignment\Test2.exe
```

```
Main Menu
```

```
1. Add a new product to the file.:  
2. Modifies the details of an existing product.:  
3. Displays the product details from the file.:  
4. Exit:  
Choose the one(1-4): 1  
Enter name of the product: pen  
Enter product ID: P7410  
Enter product category(Electronics,Household,Furniture): furniture  
Enter Quantity On Hand:8  
Record is added to the file.  
Would you like to add more(y/n)? : y  
Enter name of the product: pencil  
Enter product ID: P8520  
Enter product category(Electronics,Household,Furniture): household  
Enter Quantity On Hand:9  
Record is added to the file.  
Would you like to add more(y/n)? : n  
Do you want to do more process?Choose(1-4):3  
pen P7410 furniture 8  
pencil P8520 household 9  
Do you want to do more process?Choose(1-4):2  
Enter product ID that you want to modify: P8520  
pencil P8520 household 9  
Enter the new data.  
Enter the name: scale  
Enter the category: electronics  
Enter the quantity: 10  
Successfully modified.:Do you want to do more process?Choose(1-4):2  
Enter product ID that you want to modify: P7410  
pen P7410 furniture 8  
Enter the new data.  
Enter the name: mouse  
Enter the category: electronics  
Enter the quantity: 11  
Successfully modified.:Do you want to do more process?Choose(1-4):
```

In this output program screen the user chooses the option 2 to modify the data that has recorded and display in the file .The user Modify the Product ID by entering the new name of the product, quantity and the category of the existing file. The user enter scale in the new product,electronics in the new category and 10 in the new amount of quantity. Again, the user enter mouse in the new product, electronics in the new category and 11 in the new amount of quantity.

```
C:\Users\User\Desktop\COS212 Assignment\Test2.exe
Main Menu

1. Add a new product to the file.:
2. Modifies the details of an existing product.:
3. Displays the product details from the file.:
4. Exit:
Choose the one(1-4): 1
Enter name of the product: pen
Enter product ID: P7410
Enter product category(Electronics,Household,Furniture): furniture
Enter Quantity On Hand:8
Record is added to the file.
Would you like to add more(y/n)? : y
Enter name of the product: pencil
Enter product ID: P8520
Enter product category(Electronics,Household,Furniture): household
Enter Quantity On Hand:9
Record is added to the file.
Would you like to add more(y/n)? : n
Do you want to do more process?Choose(1-4):3
pen P7410 furniture 8
pencil P8520 household 9
Do you want to do more process?Choose(1-4):2
Enter product ID that you want to modify: P8520
pencil P8520 household 9
Enter the new data.
Enter the name: scale
Enter the category: electronics
Enter the quantity: 10
Successfully modified.:Do you want to do more process?Choose(1-4):2
Enter product ID that you want to modify: P7410
pen P7410 furniture 8
Enter the new data.
Enter the name: mouse
Enter the category: electronics
Enter the quantity: 11
Successfully modified.:Do you want to do more process?Choose(1-4):3
mouse P7410 electronics 11
scale P8520 electronics 10
Do you want to do more process?Choose(1-4):
```

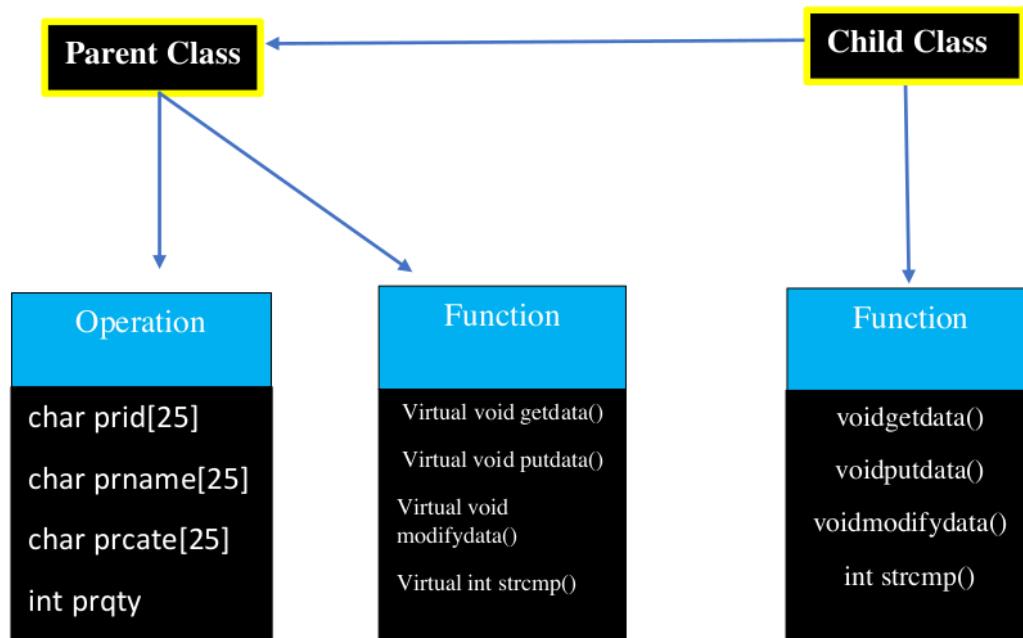
In this output screen the program displaying a modified product by choosing the option 3 from Main Menu. It displays mouse P7410 electronics 11 in the first line. Another display is scale P8520 electronics 10 in the second line.

```
C:\Users\User\Desktop\COS212 Assignment\Test2.exe
3. Displays the product details from the file.:
4. Exit:
Choose the one(1-4): 1
Enter name of the product: pen
Enter product ID: P7410
Enter product category(Electronics,Household,Furniture): furniture
Enter Quantity On Hand:8
Record is added to the file.
Would you like to add more(y/n)? : y
Enter name of the product: pencil
Enter product ID: P8520
Enter product category(Electronics,Household,Furniture): household
Enter Quantity On Hand:9
Record is added to the file.
Would you like to add more(y/n)? : n
Do you want to do more process?Choose(1-4):3
pen P7410 furniture 8
pencil P8520 household 9
Do you want to do more process?Choose(1-4):2
Enter product ID that you want to modify: P8520
pencil P8520 household 9
Enter the new data.
Enter the name: scale
Enter the category: electronics
Enter the quantity: 10
Successfully modified.:Do you want to do more process?Choose(1-4):2
Enter product ID that you want to modify: P7410
pen P7410 furniture 8
Enter the new data.
Enter the name: mouse
Enter the category: electronics
Enter the quantity: 11
Successfully modified.:Do you want to do more process?Choose(1-4):3
mouse P7410 electronics 11
scale P8520 electronics 10
Do you want to do more process?Choose(1-4):4
This is the end of program.:
-----
Process exited after 599.8 seconds with return value 2
Press any key to continue . . .
```

This is full programming page in which it shows all the operations starting from “Add a new product from the file to the exit file”. In this output screen the user chooses the option 4 to end the execute program to close the all the file.

Task3-Polymorphism

4
Polymorphism is defined as "taking several forms." Whereas inheritance allows subclasses to share, polymorphism allows subclasses to distinguish themselves from one another. The term polymorphism refers to having several forms. Polymorphism is the ability of a message to be presented in more than one form. In real life, a person might have many characteristics at the same time. Like a man, he is a father, a spouse, and an employee all at the same time. As a result, the same person exhibits diverse behavior in different settings. This is referred to as polymorphism. Polymorphism is regarded as an important element of Object-Oriented Programming.



Task3- Polymorphism (Coding Page)

```
Test3.cpp
1 #include<iostream> //input and output screen
2 #include<string.h> //present different character
3 #include<fstream> //read and write a file
4 #include<stdlib.h> //exist data
5 using namespace std; //compiler
6 char found='f';
7 class product{//declaration of base classes
8 {
9     protected:
10    char prname[25];
11    char prid[25];
12    char prcate[25];
13    int prqty;
14 public://to use from main function
15    virtual void getdata()=0;
16    virtual void showdata()=0;
17    virtual void modifydata()=0;
18    virtual int compareid(char id [25])=0;
19 };
20 class object:public product{//declaration derived class
21 {
22     public:
23        virtual void getdata()
24        {
25            cout<<"Enter name of the product: ";
26            cin>>prname;
27            cout<<"Enter product ID: ";
28            cin>>prid;
29            cout<<"Enter product category(Electronics,Household,Furniture): ";
30            cin>>prcate;
31            cout<<"Enter Quantity On Hand";
32            cin>>prqty;
33        }
34        virtual void showdata()
35        {
36            cout<<prname<<" "<<prid<<" "<<prcate<<" "<<prqty<<endl;
37        }
38        virtual void modifydata()
```

```
Test3.cpp
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)
virtual void modifydata()
{
    char name[25];
    char categ[25];
    int qty;
    cout<<"Enter the new data."<<endl;
    cout<<"Enter the name: ";
    cin>>name;
    cout<<"Enter the category: ";
    cin>>categ;
    cout<<"Enter the quantity: ";
    cin>>qty;
    strcpy(prid,id);
    strcpy(prname,name);
    strcpy(prcate,categ);
    prqty=qty;
}
virtual int compareid(char id[25])
{
    if(strcmp(prid,id)==0)//use string to compare function
    {
        return 1;
    }
    else
    {
        return 0;
    }
}
```

In these two snaps there is a declaration of base class named “Product” related to the Protected and public specifier with variable name and virtual void function such as get data, put data, show data and modify with the parameters open which is equal to zero. The object class is created with the public specifier product which is basically derived class. Applying the virtual void get data, show data and modify data integer compare Id. Alongside, string copy is also used compare function.

```

Test3.cpp
67 L };
68 int main()
69 {
    //product m1,m2,m3;
    product * a=NULL;//pointer to obtain address
    int choice, i ,count=0;
    char result;//result the process
    cout<<"Main Menu\n<endl;
    cout<<"1. Add a new product to the file."<<endl;
    cout<<"2. Modifies the details of an existing product."<<endl;
    cout<<"3. Displays the product details from the file."<<endl;
    cout<<"4. Exit"<<endl;
    cout<<"Choose the one(1-4): ";
    cin>>choice;
    do{
        if(choice==1)
        {
            object B1;//declaration of object
            a=&B1;//run-time declaration
            ifstream fio("Product.dat",ios::out); //to write in file
            if(fio.is_open())
            {
                do{
                    a->getdata(); //indirect address
                    fio.write((char*)&B1,sizeof(B1)); //to write address of B1
                    count++; //increment
                    cout<<"Record is added to the file.\n";
                    cout<<"Would you like to add more(y/n) : ";
                    cin>>result;
                }while(result=='y'||result=='Y');
            }
            else
            {
                cout<<"You can't open file.";
            }
            fio.close(); //close file
        }
        else if(choice==2)
    }

```

This snap consists of main function in which all the program start. A Null is also used to obtain the pointer address. Do while loop is also used for looping for object B1, B2, and B3. Get data function is also used for indirect address.

```

Test3.cpp
103 }
104 else if(choice==2)
105 {
    object B3;//declaration of object
    a=&B3;//runtime declaration
    char id[25];
    streampos pos;//to store position
    cout<<"Enter product ID that you want to modify: ";
    cin>>id;
    fstream in_out("Product.dat",ios::in|ios::out|ios::binary); //open operations for input,output and binary
    in_out.seekg(0); //to show the pointer
    if(in_out.is_open())
        while(!in_out.eof())
    {
        pos=in_out.tellg(); //getposition
        in_out.read((char*)&B3,sizeof(B3)); //to read address of B3
        if(a->compareid(id)==1)
        {
            a->showdata(); //get data from showdata function
            a->modifydata(); //get data form modifydata function
            in_out.seekp(pos);
            in_out.write((char*)&B3,sizeof(B3));
            found=true;
            cout<<"Successfully modified.";
            break;
        }
    }
    if(found=='f')
    {
        cout<<"Product ID is not found in the file.\n";
        cout<<"Press any key to exist : ";
        exit(1);
    }
    in_out.close();
}
else if(choice==3)
{
    object B2;//declaration object
}

```

In this snap object the declaration is B3 and it has also use stream function to store position. "If" function is also used to open and get the position in file.

```

Test3.cpp
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        break;
    }
}
if(found=='f')
{
    cout<<"Product ID is not found in the file.\n";
    cout<<"Press any key to exist : ";
    exit(1);
}
in_out.close();
}
else if(choice==3)
{
    object B2;//declaration object
    a=&B2;//run-time declaration
    ifstream infile;//to read file
    i=1;
    infile.open("Product.dat",ios::in);
    while(!infile.eof()&&i<=count)
    {
        infile.read((char*)&B2,sizeof(B2));//to read address of B2
        a->showdata();
        i++;//increment record
    }
    infile.close();
}
else
{
    cout<<"This is the end of program.";
    exit(2);
}
cout<<"Do you want to do more process?";
cout<<"Choose(1-4):";
cin>>choice;
}while(choice>=1 && choice<=4);
return 0;//execution program end here
}

```

In this snap object the declaration is B2 and it has also use stream function to store position. “If” function is also used to open and get the position in file. This is the end page of the code.

```

C:\Users\User\Desktop\COS212 Assignment\Test3.exe
Main Menu
1. Add a new product to the file.
2. Modifies the details of an existing product.
3. Displays the product details from the file.
4. Exit
Choose the one(1-4): -

```

This is the first output screen of program that will come after compile and run in Dev C++ after the debugging all the code. This code consists “Main Menu” as a title by following lists:

- Add new product to the file
- Modifies the details of an existing product
- Display the product details from the file
- Exit

Note: At the bottom there is an option from (1-4): in which the user can choose any number given in the output screen to Add, Modify, display a product and exit from the output screen.

```
C:\Users\User\Desktop\COS212 Assignment\Test3.exe
Main Menu

1. Add a new product to the file.
2. Modifies the details of an existing product.
3. Displays the product details from the file.
4. Exit
Choose the one(1-4): 1
Enter name of the product: battery
Enter product ID: P7894
Enter product category(Electronics,Household,Furniture): Electronics
Enter Quantity On Hand43
Record is added to the file.
Would you like to add more(y/n)? : y
Enter name of the product: copper
Enter product ID: P5623
Enter product category(Electronics,Household,Furniture): Furniture
Enter Quantity On Hand46
Record is added to the file.
Would you like to add more(y/n)? : n
Do you want to do more process?Choose(1-4):
```

In this output screen the user chooses the option 1 to add a new product to the file.

- 1.The user add the “battery” in the name of the product.
- 2.By following, the user adds the Product ID “P7894” in the second one.
- 3.The user add the Product Category named “Electronics” in the third one.
- 4.The user add “43” in the Quantity on Hand in the fourth one. Then the product is added to the file and so on.

Note: If the user writes yes “Would you like to add more(y/n)” in the output program screen the program will ask the user to add a new product. Whereas, if the user writes no then the program will directly move to Main Menu.

```
C:\Users\User\Desktop\COS212 Assignment\Test3.exe
Main Menu

1. Add a new product to the file.
2. Modifies the details of an existing product.
3. Displays the product details from the file.
4. Exit
Choose the one(1-4): 1
Enter name of the product: battery
Enter product ID: P7894
Enter product category(Electronics,Household,Furniture): Electronics
Enter Quantity On Hand43
Record is added to the file.
Would you like to add more(y/n)? : y
Enter name of the product: copper
Enter product ID: P5623
Enter product category(Electronics,Household,Furniture): Furniture
Enter Quantity On Hand46
Record is added to the file.
Would you like to add more(y/n)? : n
Do you want to do more process?Choose(1-4):3
battery P7894 Electronics 43
copper P5623 Furniture 46
Do you want to do more process?Choose(1-4):
```

In this output the user has already added the new product record to the file. After the user choose the option 3 which is basically displaying the product details that user has added in the Product File. The records are battery, P7894, Electronics and 43 etc.

```
C:\Users\User\Desktop\COS212 Assignment\Test3.exe
Main Menu

1. Add a new product to the file.
2. Modifies the details of an existing product.
3. Displays the product details from the file.
4. Exit
Choose the one(1-4): 1
Enter name of the product: battery
Enter product ID: P7894
Enter product category(Electronics,Household,Furniture): Electronics
Enter Quantity On Hand43
Record is added to the file.
Would you like to add more(y/n)? : y
Enter name of the product: copper
Enter product ID: P5623
Enter product category(Electronics,Household,Furniture): Furniture
Enter Quantity On Hand46
Record is added to the file.
Would you like to add more(y/n)? : n
Do you want to do more process?Choose(1-4):3
battery P7894 Electronics 43
copper P5623 Furniture 46
Do you want to do more process?Choose(1-4):2
Enter product ID that you want to modify: P5623
copper P5623 Furniture 46
Enter the new data.
Enter the name: bottle
Enter the category: household
Enter the quantity: 52
Successfully modified.Do you want to do more process?Choose(1-4):
```

In this output program screen the user chooses the option 2 to modify the data that has recorded and display in the file .The user Modify the Product ID by entering the new name of the product, quantity and the category of the existing file. The user enter bottle in the new product, household in the new category and 52 in the new amount of quantity.

```
C:\Users\User\Desktop\COS212 Assignment\Test3.exe
Main Menu

1. Add a new product to the file.
2. Modifies the details of an existing product.
3. Displays the product details from the file.
4. Exit
Choose the one(1-4): 1
Enter name of the product: battery
Enter product ID: P7894
Enter product category(Electronics,Household,Furniture): Electronics
Enter Quantity On Hand43
Record is added to the file.
Would you like to add more(y/n)? : y
Enter name of the product: copper
Enter product ID: P5623
Enter product category(Electronics,Household,Furniture): Furniture
Enter Quantity On Hand46
Record is added to the file.
Would you like to add more(y/n)? : n
Do you want to do more process?Choose(1-4):3
battery P7894 Electronics 43
copper P5623 Furniture 46
Do you want to do more process?Choose(1-4):2
Enter product ID that you want to modify: P5623
copper P5623 Furniture 46
Enter the new data.
Enter the name: bottle
Enter the category: household
Enter the quantity: 52
Successfully modified.Do you want to do more process?Choose(1-4):3
battery P7894 Electronics 43
bottle P5623 household 52
Do you want to do more process?Choose(1-4):
```

In this output screen the program displaying a modified product by choosing the option 3 from Main Menu. It displays bottle P5623 household 52 in the first line.

```
C:\Users\User\Desktop\COS212 Assignment\Test3.exe
Main Menu

1. Add a new product to the file.
2. Modifies the details of an existing product.
3. Displays the product details from the file.
4. Exit
Choose the one(1-4): 1
Enter name of the product: battery
Enter product ID: P7894
Enter product category(Electronics,Household,Furniture): Electronics
Enter Quantity On Hand43
Record is added to the file.
Would you like to add more(y/n)? : y
Enter name of the product: copper
Enter product ID: P5623
Enter product category(Electronics,Household,Furniture): Furniture
Enter Quantity On Hand46
Record is added to the file.
Would you like to add more(y/n)? : n
Do you want to do more process?Choose(1-4):3
battery P7894 Electronics 43
copper P5623 Furniture 46
Do you want to do more process?Choose(1-4):2
Enter product ID that you want to modify: P5623
copper P5623 Furniture 46
Enter the new data.
Enter the name: bottle
Enter the category: household
Enter the quantity: 52
Successfully modified.Do you want to do more process?Choose(1-4):3
battery P7894 Electronics 43
bottle P5623 household 52
Do you want to do more process?Choose(1-4):4
This is the end of program.
-----
Process exited after 5901 seconds with return value 2
Press any key to continue . . .
```

This is full programming page in which it shows all the operations starting from “Add a new product from the file to the exit file”. In this output screen the user chooses the option 4 to end the execute program to close the all the file.

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[Accessed 25 July 2022].

Final Assignment(c++)

ORIGINALITY REPORT



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