MTS 3053: *PROGRAMMING PARADIGM*

SESI PENGAJIAN: SEM 2 (2021/2022)

KUMPULAN KULIAH MTS 3053 (A211): A *(GROUP 6)*

(*GROUP PROJECT – C++*)

STRUCTURED AND OBJECT-ORIENTED APPROACH

NAMA	NO MATRIC	NO. HP	PROGRAM
SYARIF IMRAN BIN ROSLAN	D20201093977	011-2606 2687	AT20 - IJAZAH SARJANA MUDA PENDIDIKAN (TEKNOLOGI MAKLUMAT)
NURUL SYAFIKA BINTI ABDULLAH	D20201095574	019- 358 8660	AT20 - IJAZAH SARJANA MUDA PENDIDIKAN (TEKNOLOGI MAKLUMAT)
MOHD IZZUL IKHWAN BIN MOHD YUSOF	D20201095609	019-781 8481	AT20 - IJAZAH SARJANA MUDA PENDIDIKAN (TEKNOLOGI MAKLUMAT)
NURUL NAJWA BINTI MOHD ALI	D20201095610	019-292 3817	AT20 - IJAZAH SARJANA MUDA PENDIDIKAN (TEKNOLOGI MAKLUMAT)

NAMA PENSYARAH: PROFESOR MADYA DR. NOR HASBIAH BINTI UBAIDULLAH

MTS 3053 – PROGRAMMING PARADIGM

GROUP ASSIGNMENT (20%)

A whole sale company, Wira Jaya sells a product X to two types of customers, wholesaler[w] and retailer[r]. The price of the product is based on the number of units ordered and the customer's type which is shown in Table 1. When the customer placed an order, the company must calculate and print out an invoice. The example of the invoice is shown in Figure 1.

Wholesaler		**Retailer**	
Number of units	**Price per unit (RM)**	**Number of units**	**Price per unit (RM)**
1-50	10	1-50	15
51-100	8	51-150	14
101-200	6	151-200	12
201 and above	3	201 and above	8

Table 1

You are required to :

a) Analyze the problem (input, process, and output) - 5m

Answer:

Input: Number of units ordered by user.

Process: Calculate price of an order and print out an invoice.

Output: Price of an order.

b) Create a C++ program using **structured approach** to solve the problem.

- 20m

Answer:

FULL PROGRAM STRUCTURED APPROACH

```
#include<iostream>
#include<iomanip>
using namespace std;

struct customer {
   int no;
   char status;
   int unit;
   int price;
   int sum;
};

void displayData(customer);

int main() {
   customer c;

   cout<<"+-------------------------------------+\n";
   cout<<"    Welcome To Wira Jaya SDN. BHD.    \n";
   cout<<"+-------------------------------------+\n\n";

   cout<<"Please enter your customer no: ";
   cin>>c.no;

   menu:
   cout<<"Please enter customer status (wholesaler[w] / retailer[r]):
";
   cin>>c.status;

   switch (c.status)
   {
      case 'w':
         cout<<"\n            WholeSaler[w]             \n";
         cout<< setw(20) << left << "Number of Units" << right <<
"Price Per Units\n";
         cout<< setw(20) << left << "1-50" << right << "RM 10\n";
         cout<< setw(20) << left << "51-100" << right << "RM 8\n";
         cout<< setw(20) << left << "101-200" << right << "RM 6\n";
         cout<< setw(20) << left << "201-above" << right << "RM
3\n\n";
         break;

      case 'r':
         cout<<"\n             Retailer[r]              \n";
         cout<< setw(20) << left << "Number of Units" << right <<
"Price Per Units\n";
         cout<< setw(20) << left << "1-50" << right << "RM 15\n";
         cout<< setw(20) << left << "51-100" << right << "RM 14\n";
         cout<< setw(20) << left << "101-200" << right << "RM 12\n";
         cout<< setw(20) << left << "201-above" << right << "RM
8\n\n";
         break;
```

```
      default:
         cout<<"Sorry! We cannot continue your order. Please insert an
valid keyword; (Wholesaler[w] / Retailer[r].\n\n";
         goto menu;
   }

   unit:
   cout<<"How many unit do you want: ";
   cin>>c.unit;

   if(c.status=='w')
   {
    if(c.unit>=1 && c.unit<=50)
    {
      c.price=10;
    }
    else if(c.unit>=50 && c.unit<=100)
    {
      c.price=8;
    }
    else if(c.unit>=100 && c.unit<=200)
    {
      c.price=6;
    }
    else if(c.unit>=200)
    {
      c.price=3;
    }
    else
    {
      cout<<"Sorry! We cannot continue your order. The 0 and
negative(-) number is not allowed.\n\n";
      goto unit;
    }
   }

   else if(c.status=='r')
   {
    if(c.unit>=1 && c.unit<=50)
    {
      c.price=15;
    }
    else if(c.unit>=50 && c.unit<=100)
    {
      c.price=14;
    }
    else if(c.unit>=100 && c.unit<=200)
    {
      c.price=12;
    }
    else if(c.unit>=200)
    {
      c.price=8;
    }
    else
    {
      cout<<"Sorry! We cannot continue your order. The 0 and
negative(-) number is not allowed.\n\n";
      goto unit;
    }
```

```
    }


    c.sum=c.unit*c.price;

    displayData(c);

    return 0;
}

void displayData(customer c) {

    cout<<"\n\n+-------------------------------------+\n";
    cout<<"      Company Wira Jaya SDN. BHD.     \n";
    cout<<"+-------------------------------------+\n\n";

    cout<<"Customer No: " << c.no << endl;
    cout<<"Customer Status (Wholesaler[w] / Retailer[r]): " << c.status
<< endl;
    cout<<"Number of Units: " << c.unit << endl;
    cout<<"Price Per Unit: " <<c.price << endl;
    cout<<"Price of an Order: " <<c.sum << endl;
}
```

c) Create a C++ program using **object-oriented approach** to solve the problem.

- 20m

Answer:

FULL PROGRAM OBJECT-ORIENTED APPROACH

```
#include<iostream>
#include<string.h>
#include<iomanip>
using namespace std;

class CUSTOMER
{
   private:
      int no;
      char status;
      int unit;
      int price;
      int sum;
   public:
      void CustomerNo();
      void CustomerStatus();
      void CustomerUnit();
      void DisplayData();
};

void CUSTOMER :: CustomerNo()
{
   cout<<"+-------------------------------------+\n";
   cout<<"    Welcome To Wira Jaya SDN. BHD.    \n";
   cout<<"+-------------------------------------+\n\n";

   cout<<"Please enter your customer no: ";
   cin>>no;
}

void CUSTOMER :: CustomerStatus()
{
   menu:
   cout<<"Please enter customer status (wholesaler[w] / retailer[r]):
";
   cin>>status;

   switch (status)
   {
      case 'w':
         cout<<"\n            WholeSaler[w]             \n";
         cout<< setw(20) << left << "Number of Units" << right <<
"Price Per Units\n";
         cout<< setw(20) << left << "1-50" << right << "RM 10\n";
         cout<< setw(20) << left << "51-100" << right << "RM 8\n";
         cout<< setw(20) << left << "101-200" << right << "RM 6\n";
         cout<< setw(20) << left << "201-above" << right << "RM
3\n\n";
         break;

      case 'r':
         cout<<"\n             Retailer[r]              \n";
```

```
         cout<< setw(20) << left << "Number of Units" << right <<
"Price Per Units\n";
         cout<< setw(20) << left << "1-50" << right << "RM 15\n";
         cout<< setw(20) << left << "51-100" << right << "RM 14\n";
         cout<< setw(20) << left << "101-200" << right << "RM 12\n";
         cout<< setw(20) << left << "201-above" << right << "RM
8\n\n";
         break;

      default:
         cout<<"Sorry! We cannot continue your order. Please insert an
valid keyword; (Wholesaler[w] / Retailer[r].\n\n";
         goto menu;
   }
}

void CUSTOMER :: CustomerUnit()
{
   unit:
   cout<<"How many unit do you want: ";
   cin>>unit;

   if(status=='w')
   {
    if(unit>=1 && unit<=50)
    {
      price=10;
    }
    else if(unit>=51 && unit<=100)
    {
      price=8;
    }
    else if(unit>=101 && unit<=200)
    {
      price=6;
    }
    else if(unit>=201)
    {
      price=3;
    }
    else
    {
      cout<<"Sorry! We cannot continue your order. The 0 and
negative(-) number is not allowed.\n\n";
      goto unit;
    }
   }

   else if(status=='r')
   {
    if(unit>=1 && unit<50)
    {
      price=15;
    }
    else if(unit>=51 && unit<150)
    {
      price=14;
    }
    else if(unit>=151 && unit<=200)
    {
```

```
      price=12;
     }
     else if(unit>=201)
     {
       price=8;
     }
     else
     {
       cout<<"Sorry! We cannot continue your order. The 0 and
negative(-) number is not allowed.\n\n";
       goto unit;
     }
    }

    sum=unit*price;
}

void CUSTOMER :: DisplayData()
{
    cout<<"\n\n+-------------------------------------+\n";
    cout<<"      Company Wira Jaya SDN. BHD.     \n";
    cout<<"+-------------------------------------+\n\n";

    cout<<"Customer No: " << no << endl;
    cout<<"Customer Status (Wholesaler[w] / Retailer[r]): " << status
<< endl;
    cout<<"Number of Units: " << unit << endl;
    cout<<"Price Per Unit: " << price << endl;
    cout<<"Price of an Order: " << sum << endl;
}

void main()
{
    CUSTOMER wira;

    {
       wira.CustomerNo();
       wira.CustomerStatus();
       wira.CustomerUnit();
       wira.DisplayData();
    }
}
```

d) Print out an invoice for the customer. Example of invoice is shown below. – 5m

```
                    COMPANY WIRA JAYA SDN. BHD.

CUSTOMER NO          :  28030

CUSTOMER STATUS ( [w ] wholesaler / [r ] retailer )   : w

NUMBER OF UNITS      : 100 units

PRICE PER UNIT       : RM 8

PRICE OF AN ORDER    : RM 800
```

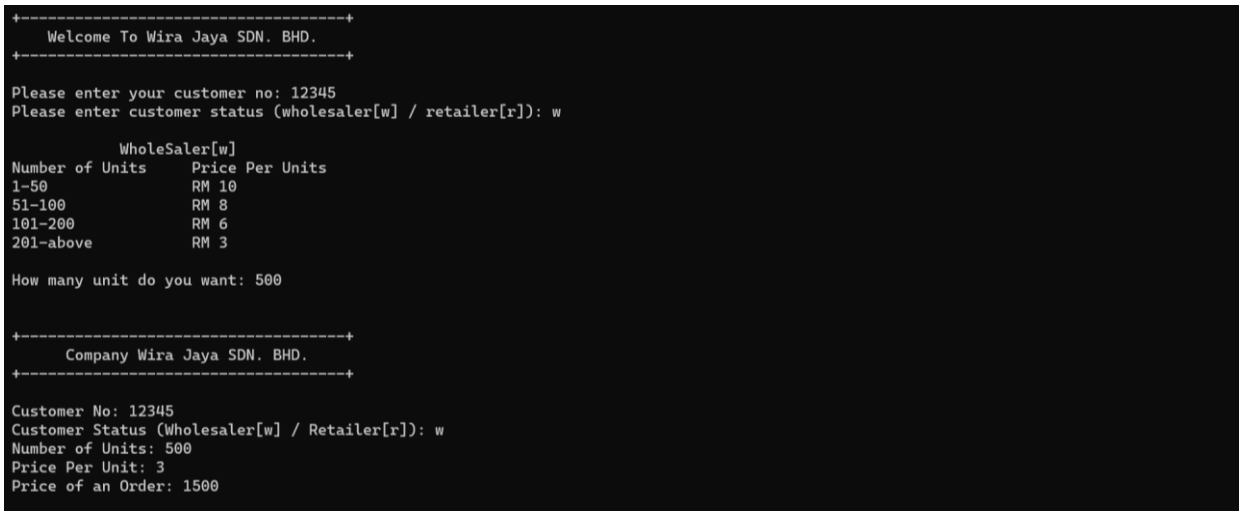
Figure 1

Answer:

Wholesaler [w]

```
+----------------------------------+
    Welcome To Wira Jaya SDN. BHD.
+----------------------------------+

Please enter your customer no: 12345
Please enter customer status (wholesaler[w] / retailer[r]): w

           WholeSaler[w]
Number of Units     Price Per Units
1-50                RM 10
51-100              RM 8
101-200             RM 6
201-above           RM 3

How many unit do you want: 50


+----------------------------------+
      Company Wira Jaya SDN. BHD.
+----------------------------------+

Customer No: 12345
Customer Status (Wholesaler[w] / Retailer[r]): w
Number of Units: 50
Price Per Unit: 10
Price of an Order: 500
```

```
+----------------------------------+
    Welcome To Wira Jaya SDN. BHD.
+----------------------------------+

Please enter your customer no: 12345
Please enter customer status (wholesaler[w] / retailer[r]): w

           WholeSaler[w]
Number of Units     Price Per Units
1-50                RM 10
51-100              RM 8
101-200             RM 6
201-above           RM 3

How many unit do you want: 100


+----------------------------------+
      Company Wira Jaya SDN. BHD.
+----------------------------------+

Customer No: 12345
Customer Status (Wholesaler[w] / Retailer[r]): w
Number of Units: 100
Price Per Unit: 8
Price of an Order: 800
```



Our system's initial screen asks you to enter your customer number. After that, if you type the letter [w], you'll be led to the wholesaler's display, where you'll see the number of units you may order as well as the price per unit. If you choose to order a certain number of units, our system will multiply that number by the price per unit. For the final output, our system will display the customer number, customer status (whether you are a wholesaler[w] or retailer[r] depending on what you enter as input), number of units you wish to purchase, price per unit for each number of units, and price of an order multiplied by your order. ***This output is same for both program (structured and object-oriented approach).***

Retailer [r]

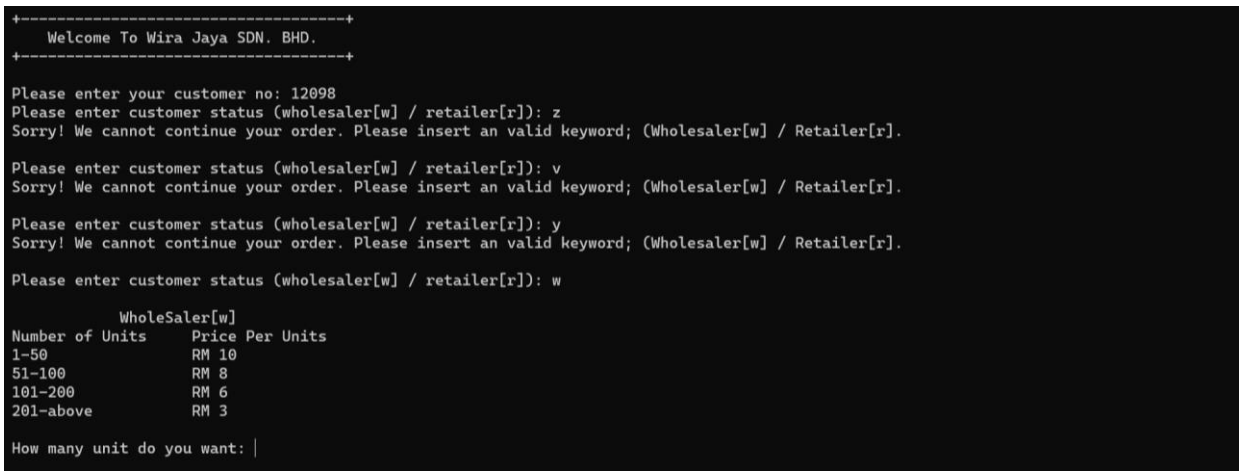
```
+-----------------------------------+
    Welcome To Wira Jaya SDN. BHD.
+-----------------------------------+

Please enter your customer no: 09876
Please enter customer status (wholesaler[w] / retailer[r]): r

            Retailer[r]
Number of Units     Price Per Units
1-50                RM 15
51-100              RM 14
101-200             RM 12
201-above           RM 8

How many unit do you want: 1


+-----------------------------------+
      Company Wira Jaya SDN. BHD.
+-----------------------------------+

Customer No: 9876
Customer Status (Wholesaler[w] / Retailer[r]): r
Number of Units: 1
Price Per Unit: 15
Price of an Order: 15
```

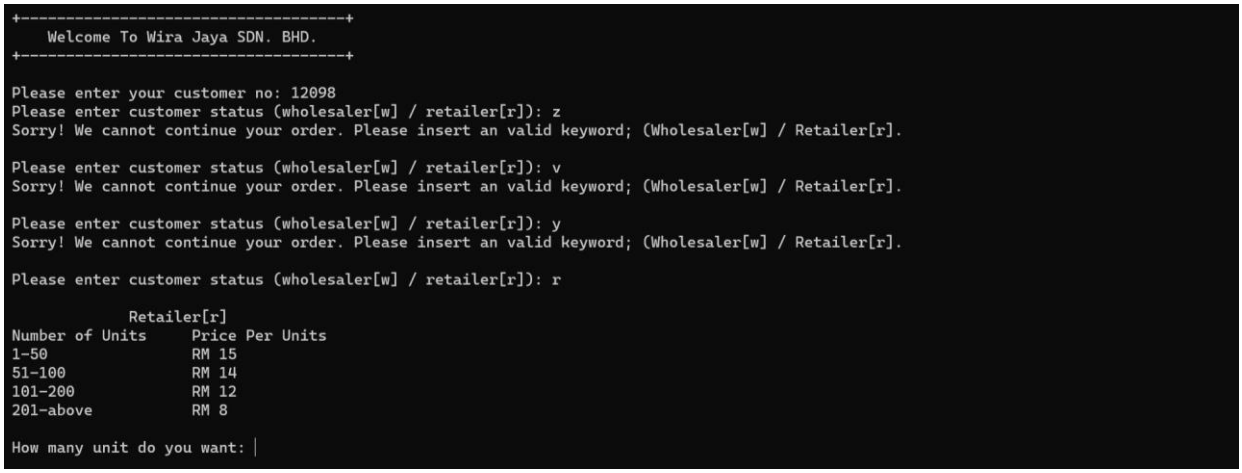
```
+-----------------------------------+
    Welcome To Wira Jaya SDN. BHD.
+-----------------------------------+

Please enter your customer no: 09876
Please enter customer status (wholesaler[w] / retailer[r]): r

            Retailer[r]
Number of Units     Price Per Units
1-50                RM 15
51-100              RM 14
101-200             RM 12
201-above           RM 8

How many unit do you want: 90


+-----------------------------------+
      Company Wira Jaya SDN. BHD.
+-----------------------------------+

Customer No: 9876
Customer Status (Wholesaler[w] / Retailer[r]): r
Number of Units: 90
Price Per Unit: 14
Price of an Order: 1260
```

```
+-----------------------------------+
    Welcome To Wira Jaya SDN. BHD.
+-----------------------------------+

Please enter your customer no: 09876
Please enter customer status (wholesaler[w] / retailer[r]): r

            Retailer[r]
Number of Units     Price Per Units
1-50                RM 15
51-100              RM 14
101-200             RM 12
201-above           RM 8

How many unit do you want: 180


+-----------------------------------+
      Company Wira Jaya SDN. BHD.
+-----------------------------------+

Customer No: 9876
Customer Status (Wholesaler[w] / Retailer[r]): r
Number of Units: 180
Price Per Unit: 12
Price of an Order: 2160
```

Our system's initial screen asks you to enter your customer number. After that, if you type the letter [r], you'll be led to the retailer's display, where you'll see the number of units you may order as well as the price per unit. If you choose to order a certain number of units, our system will multiply that number by the price per unit. For the final output, our system will display the customer number, customer status (whether you are a wholesaler[w] or retailer[r] depending on what you enter as input), number of units you wish to purchase, price per unit for each number of units, and price of an order multiplied by your order. ***This output is same for both program (structured and object-oriented approach).***

Error Message *(other than [w] and [r] word for the customer status)*





If you enter other than [w] and [r] word for the customer status, the error message will pop out that say *"Sorry! We cannot continue your order. Please insert a valid keyword; (Wholesaler[w] / Retailer[r].* This error message will continually pop out if you still enter the word other than [w] and [r]. The system will continue to work if you enter the valid word; [w] and [r]. ***This output is same for both program (structured and object-oriented approach).***

Error Message *(enter 0 or negative number for the number per units)*

```
+-----------------------------------+
    Welcome To Wira Jaya SDN. BHD.
+-----------------------------------+

Please enter your customer no: 12098
Please enter customer status (wholesaler[w] / retailer[r]): w

           WholeSaler[w]
Number of Units     Price Per Units
1-50                RM 10
51-100              RM 8
101-200             RM 6
201-above           RM 3

How many unit do you want: 0
Sorry! We cannot continue your order. The 0 and negative(-) number is not allowed.

How many unit do you want: -50
Sorry! We cannot continue your order. The 0 and negative(-) number is not allowed.

How many unit do you want: 10


+-----------------------------------+
      Company Wira Jaya SDN. BHD.
+-----------------------------------+

Customer No: 12098
Customer Status (Wholesaler[w] / Retailer[r]): w
Number of Units: 10
Price Per Unit: 10
Price of an Order: 100
```

```
+-----------------------------------+
    Welcome To Wira Jaya SDN. BHD.
+-----------------------------------+

Please enter your customer no: 12098
Please enter customer status (wholesaler[w] / retailer[r]): r

            Retailer[r]
Number of Units     Price Per Units
1-50                RM 15
51-100              RM 14
101-200             RM 12
201-above           RM 8

How many unit do you want: 0
Sorry! We cannot continue your order. The 0 and negative(-) number is not allowed.

How many unit do you want: -50
Sorry! We cannot continue your order. The 0 and negative(-) number is not allowed.

How many unit do you want: 10


+-----------------------------------+
      Company Wira Jaya SDN. BHD.
+-----------------------------------+

Customer No: 12098
Customer Status (Wholesaler[w] / Retailer[r]): r
Number of Units: 10
Price Per Unit: 15
Price of an Order: 150
```

If you enter 0 and negative(-) number for the number of units, the error message will pop out that say *"Sorry! We cannot continue your order. The 0 and negative(-) number is not allowed.* This error message will continually pop out if you still enter the 0 and negative(-) number. The system will continue to work if you enter the valid number. ***This output is same for both program (structured and object-oriented approach).***

You are required to use a **switch statement** to determine the customer's status. If the user enter status other than w and r, display an appropriate error message. Use an **if statement** to determine the price per unit. If the user enters an invalid number of units (e.g. : a negative number or 0), display an appropriate error message.

Instruction:

You should work in a group. There should be **three or four** students in each group.

Upload: 20 May 2022

Due date: 1 July 2022 (W14)