NDJ10703 – OBJECT ORIENTED PROGRAMMING.

SEMESTER 2 2022/2023

Lab Report 3: Creating Class-Object

Exercise 1: Rectangle

```
#include <iostream>
#include"Rectangle.h"

using namespace std;

int main()
{
    Rectangle rect;
    rect.set_values(5,7);
    cout<<"area: " << rect.area();
    return 0;
}

class Rectangle{
    int width;
    int height;

public:
    void set_values(int,int);
    int area();
};

void Rectangle::set_values(int x,int y){
 width=x;
 height=y;
 }

int Rectangle::area(){
    return width*height;
}
```

Rectangle

1. Briefly describe following statements:

   a) #include<iostream>

   (5 Marks)

   b) Using namespace std;

   (5 Marks)

c) int area()
{ return
width*height;
}

(5 Marks)

d) void set_values(int, int);

(5 Marks)

e) void Rectangle::set_values(int x,int y){
width=x;
height=y;
}

(5 Marks)

f) class Rectangle{
int width;
int height;
public:
void set_values(int,int);
int area();
};

(5 Marks)

g) Rectangle rect;

(5 Marks)

h) rect.set_values(5,7);

(5 Marks)

2. Write all descriptions in Question 1 as comments in the code.
   a. Create a new object ("rect1") from the class Rectangle with the area size $100m^2$. Print the area of the object for "rect" and "rect1". Modify the above code to accomplish.

(20 Marks)

3. Modify the code to create a new function to **read** input from users so that users can insert the values for width and height.

(20 Marks)

Exercise 2: Circle

```
#include <iostream>
#include"Cylinder.h"

using namespace std;

int main()
{
    Cylinder cyn(10,20);
    cout<<"cyns's volume: " << cyn.volume()<<endl;
    return 0;
}
```

Main function

```
#include<iostream>
using namespace std;
class Circle{
    double radius;

public:
    Circle(double r):radius(r){}
    double area() {return radius*radius*3.14159265;}
};
```

Class Circle

```
#include<iostream>
#include "Circle.h"

using namespace std;

class Cylinder{
    Circle base;
    double height;
public:
    Cylinder (double r, double h):base (r),
height(h){}
    double volume(){return base.area()*height;}
};
```

Class Cylinder

1. List;
   a) The classes that you have created.

(5 Marks)

   b) access specifier for the member classes.

(5 Marks)

2) In the statement “double radius”, change double to int. Execute the program. What are the errors you get? Why the errors occur?

(5 Marks)

3) Now, change all the term “double” to int. What is the output? Compare with the output when you run the code at the first time.

(5 Marks)

ANSWER SHEET

Exercise 1

a) The ***#include <iostream>*** is the library dedicated for Input and out put of C++. ***#Include*** are used to implement the library file into our program.

b) ***Using namespace std*** are used to tell the system the directory of the library so the program can read the library and use the functionality of the library.

c) ***int area () {return weight * height;}*** is the operation function in the ***Rectangle Class*** to calculate and return the value.

d) ***void set_values (int, int);*** is used to make the private class can be access to gave the value to the variable in the ***Class.***

e) ***void Rectangle: set_values (int x, int y) {width=x; height=y;}*** are the function definition for the function that are belong in the class. The function in the class is set to public so it can be defined freely outside the class. The ***Scope Resolution Operator (::)*** symbols are used to indicate the variable belong to which class.

f) ***class Rectangle {int width; int height; public: void set_values (int, int); int area ();};*** is the class structure that consist of their own **object** in the **class.** In this code, the object in the Rectangle Class are ***weight*** and ***height***. This object as default is set as **private** that can't be access outside the class. The other 2 object in the class, ***void set_values (int, int);*** and ***int area ();*** are set to public.

g) ***Rectangle rect;*** is line code to define the variable name for the **Class.** In this code, the variable name for the code is **rect** that is the name for the **Rectangle Class**.

h) ***Rect.set_values (5,7)*** are the function call to gave the value to the object in the Class. ***rect.*** are used to indicates that are the function ***(set_values)*** used is the function that is in the ***Class***.

CODE:

```
#include <iostream> // Used to define library of the program. <iostream>
are standard input and output library in C++
//#include"Rectangle.h"

using namespace std; //Using namespace std are used to tell the system the
directory of the library

//the class structure that consist of their own object in the class.
class Rectangle{
    int width;
    int height;
    public:
        void set_values(int,int); // used to make the private class can be
access to gave the value to the variable in the Class
        int area();
};

int main()
{
Rectangle rect, rect1; //define the variable name for the Class.
rect.set_values(5,7); // function call to gave the value to the object in
the Class. rect.
rect1.set_values(10,10);
cout<<"area: " << rect.area() << endl;
cout<<"area: " << rect1.area();
return 0;
}

void Rectangle::set_values(int x,int y){ // function in the class is set to
public so it can be defined freely outside the class.
width=x;
height=y;
}
int Rectangle::area(){ //  operation function in the Rectangle Class to
calculate and return the value.
return width*height;
}
```

CODE 2:

```
#include <iostream>
//#include"Rectangle.h"
using namespace std;

class Rectangle{
    int width;
    int height;
    public:
        void set_values(int,int);
        int area();
        void input_user (int,int);
};
int main()
{
    int x,y;
    Rectangle rect;
    rect.input_user(x,y);
    cout<<"area: " << rect.area() << endl;

return 0;
}
void Rectangle::set_values(int x,int y){
    width=x;
    height=y;
}

int Rectangle::area(){
return width*height;
}

void Rectangle::input_user(int x, int y){

    cout << "Input Width :" ;
    cin >> x;
    width = x;
    cout << "Input Height :" ;
    cin >> y;
    height = y;
}
```

Exercise 2

1)

a) - **Class Circle**
   - **Class Cylinder**

b) **Public** is the access specifier for the class member

2) There is no error occur. This is because the input of the data of radius are in whole number. So, it does not affect the output of the program

3) **The Output :** ***cyns's volume: 6280***

The result become whole number because ***int*** variable are not holding decimals in the data. So, the result became whole number.