

EUROPEAN UNIVERSITY OF LEFKE
Faculty of Engineering
Department of Computer Engineering



COMP218
OBJECT-ORIENTED
PROGRAMMING

Lab Work No. 6

Prepared by Seward Richard Mupereri (20140175)

Submitted to Dr. Ferhun Yorgancıoğlu

Task (1)

```
#include <iostream>
#include <iomanip>
#include <cmath>

using namespace std;

class rectangle
{
public:
    rectangle();
    rectangle( int, int );
    ~rectangle();
    void setLength( int );
    void setHeight( int );

    int getLength();
    int getHeight();
    int getArea();
    int getCircumference();
    double getDLength();

private:
    int length, height;
};

rectangle::rectangle()
{
    setLength(0);
    setHeight(0);
}

rectangle::rectangle( int l, int h )
{
    setLength( l );
    setHeight( h );
}

rectangle::~~rectangle(){};

void rectangle::setLength( int l )
{
    length = l;
}

void rectangle::setHeight( int h )
{
    height = h;
}

int rectangle::getLength()
{
    return length;
}

int rectangle::getHeight()
{
    return height;
}
```

```

int rectangle::getArea()
{
    return ( getLength() * getHeight() );
}

int rectangle::getCircumference()
{
    return ( ( getLength() + getHeight() ) * 2 );
}

double rectangle::getDLength()
{
    return ( sqrt( pow( getLength(), 2 ) + pow( getHeight(), 2 ) ) );
}

int main()
{
    rectangle r;
    int length, height;

    cout << "-----" << endl;
    cout << "|   OPERATIONS ON A RECTANGLE OBJECT   |" << endl;
    cout << "-----" << endl;

    cout << setw(20) << "Enter the length:";
    cin >> length;
    r.setLength( length );

    cout << setw(20) << "Enter the height:";
    cin >> height;
    r.setHeight( height );

    cout << endl;

    cout << setw(20) << "AREA = " << r.getArea() << endl;
    cout << setw(20) << "CIRCUMFERENCE = " << r.getCircumference() << endl;
    cout << setw(20) << "DIAGONAL LENGTH = " << setprecision(3) << r.getDLength() << endl << endl;

    cout << "-----" << endl;
    cout << "|   RECTANGLE OBJECT CREATED USING   |" << endl;
    cout << "|           CONSTRUCTOR           |" << endl;
    cout << "-----" << endl;

    rectangle r1(0, 0);

    cout << endl;

    cout << setw(20) << "LENGTH = " << r1.getLength() << endl;
    cout << setw(20) << "HEIGHT = " << r1.getHeight() << endl;
    cout << setw(20) << "AREA = " << r1.getArea() << endl;
    cout << setw(20) << "CIRCUMFERENCE = " << r1.getCircumference() << endl;
    cout << setw(20) << "DIAGONAL LENGTH = " << setprecision(3) << r1.getDLength() << endl;

    cout << "-----" << endl;
    cout << "|           END OF PROGRAM           |" << endl;
    cout << "-----" << endl;

    return 0;
}

```

OPERATIONS ON A RECTANGLE OBJECT

Enter the length:2

Enter the height:5

AREA = 10

CIRCUMFERENCE = 14

DIAGONAL LENGTH = 5.39

| RECTANGLE OBJECT CREATED USING |
CONSTRUCTOR

LENGTH = 0

HEIGHT = 0

AREA = 0

CIRCUMFERENCE = 0

DIAGONAL LENGTH = 0

END OF PROGRAM

Task (2)

Header file – rectangle.h

```
#ifndef RECTANGLE_H
#define RECTANGLE_H

class rectangle
{
public:
    rectangle();
    rectangle( int, int );
    ~rectangle();
    void setLength( int );
    void setHeight( int );

    void getRectangle( rectangle );
    int getLength();
    int getHeight();
    int getArea();
    int getCircumference();
    double getDLength();

    void getX_Base_Cord ();

private:
    int length, height;
};

#endif //RECTANGLE
```

Implementation file – rectangle.cpp

```
#include <iostream>
#include <iomanip>
#include <cmath>
#include "rectangle.h"

using namespace std;

rectangle::rectangle()
{
    setLength(0);
    setHeight(0);
}

rectangle::rectangle( int l, int h )
{
    setLength( l );
    setHeight( h );
}

rectangle::~rectangle(){};

void rectangle::setLength( int l )
{
    length = l;
}

void rectangle::setHeight( int h )
{
    height = h;
}

void rectangle::getRectangle(rectangle r)
{
    int n = 25;
    cout << setw(n) << "LENGTH = " << r.getLength() << endl;
    cout << setw(n) << "HEIGHT = " << r.getHeight() << endl;
    cout << setw(n) << "AREA = " << r.getArea() << endl;
    cout << setw(n) << "CIRCUMFERENCE = " << r.getCircumference() << endl;
    cout << setw(n) << "DIAGONAL LENGTH = " << setprecision(3) << r.getDLength() << endl;
}

int rectangle::getLength()
{
    return length;
}

int rectangle::getHeight()
{
    return height;
}

int rectangle::getArea()
{
    return ( getLength() * getHeight() );
}

int rectangle::getCircumference()
{

```

```
    return ( ( getLength() + getHeight() ) * 2 );
}

double rectangle::getDLength()
{
    return ( sqrt( pow( getLength(), 2 ) + pow( getHeight(), 2 ) ) );
}

void rectangle::getX_Base_Cord()
{
    cout << setw(17) << "x1:" << 0 << setw(8) << "y1:" << 0 << endl;
    cout << setw(17) << "x2:" << length << setw(8) << "y2:" << 0 << endl;
    cout << setw(17) << "x3:" << 0 << setw(8) << "y3:" << height << endl;
    cout << setw(17) << "x4:" << length << setw(8) << "y4:" << height << endl;
}
```

Driver program – main.cpp

```
#include <iostream>
#include <iomanip>
#include "rectangle.h"

using namespace std;

int main() {
    rectangle r;
    int length, height;

    cout << "-----" << endl;
    cout << "|   OPERATIONS ON A RECTANGLE OBJECT   |" << endl;
    cout << "-----" << endl;

    cout << setw(25) << "Enter the length:";
    cin >> length;
    r.setLength(length);

    cout << setw(25) << "Enter the height:";
    cin >> height;
    r.setHeight(height);

    cout << endl;

    r.getRectangle( r );
    cout << "-----" << endl;
    cout << "|   RECTANGLE OBJECT CREATED USING   |" << endl;
    cout << "|           CONSTRUCTOR           |" << endl;
    cout << "-----" << endl;

    rectangle r1(3, 1);

    cout << endl;

    r1.getRectangle( r1 );

    cout << "-----" << endl;
    cout << "|           OPTIONAL TASK           |" << endl;
    cout << "-----" << endl;

    r1.getX_Base_Cord();
    cout << endl;

    cout << "-----" << endl;
    cout << "|           END OF PROGRAM           |" << endl;
    cout << "-----" << endl;

    return 0;
}
```


Output:

```
-----
|      OPERATIONS ON A RECTANGLE OBJECT      |
|-----|
|
|   Enter the length:9
|   Enter the height:8
|
|           LENGTH = 9
|           HEIGHT = 8
|           AREA = 72
|       CIRCUMFERENCE = 34
|   DIAGONAL LENGTH = 12
|-----|
|      RECTANGLE OBJECT CREATED USING      |
|      CONSTRUCTOR                         |
|-----|
|
|           LENGTH = 3
|           HEIGHT = 1
|           AREA = 3
|       CIRCUMFERENCE = 8
|   DIAGONAL LENGTH = 3.16
|-----|
|      OPTIONAL TASK                       |
|-----|
|
|           x1:0      y1:0
|           x2:3      y2:0
|           x3:0      y3:1
|           x4:3      y4:1
|
|-----|
|      END OF PROGRAM                      |
|-----|
```