Applied Programming

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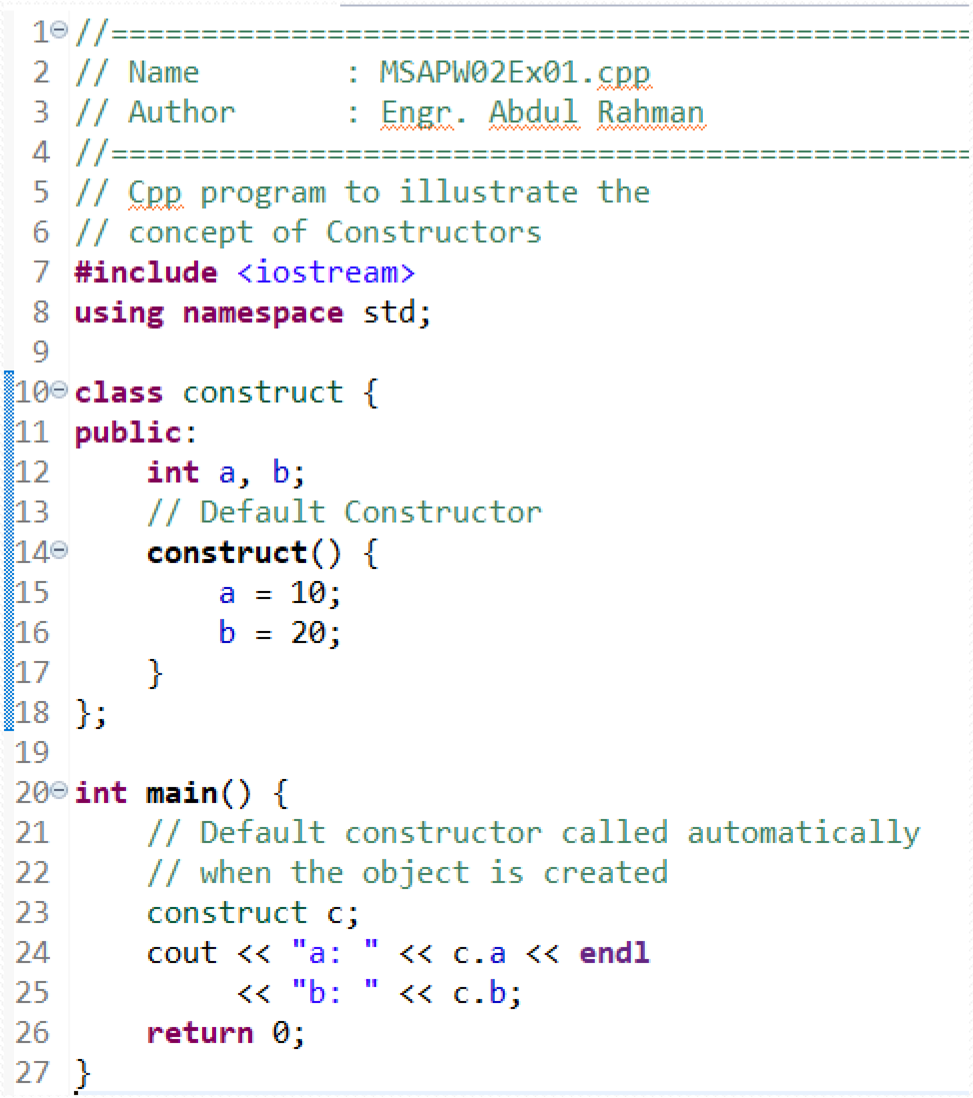
C++ Constructors / Destructors

Ex01: Constructors

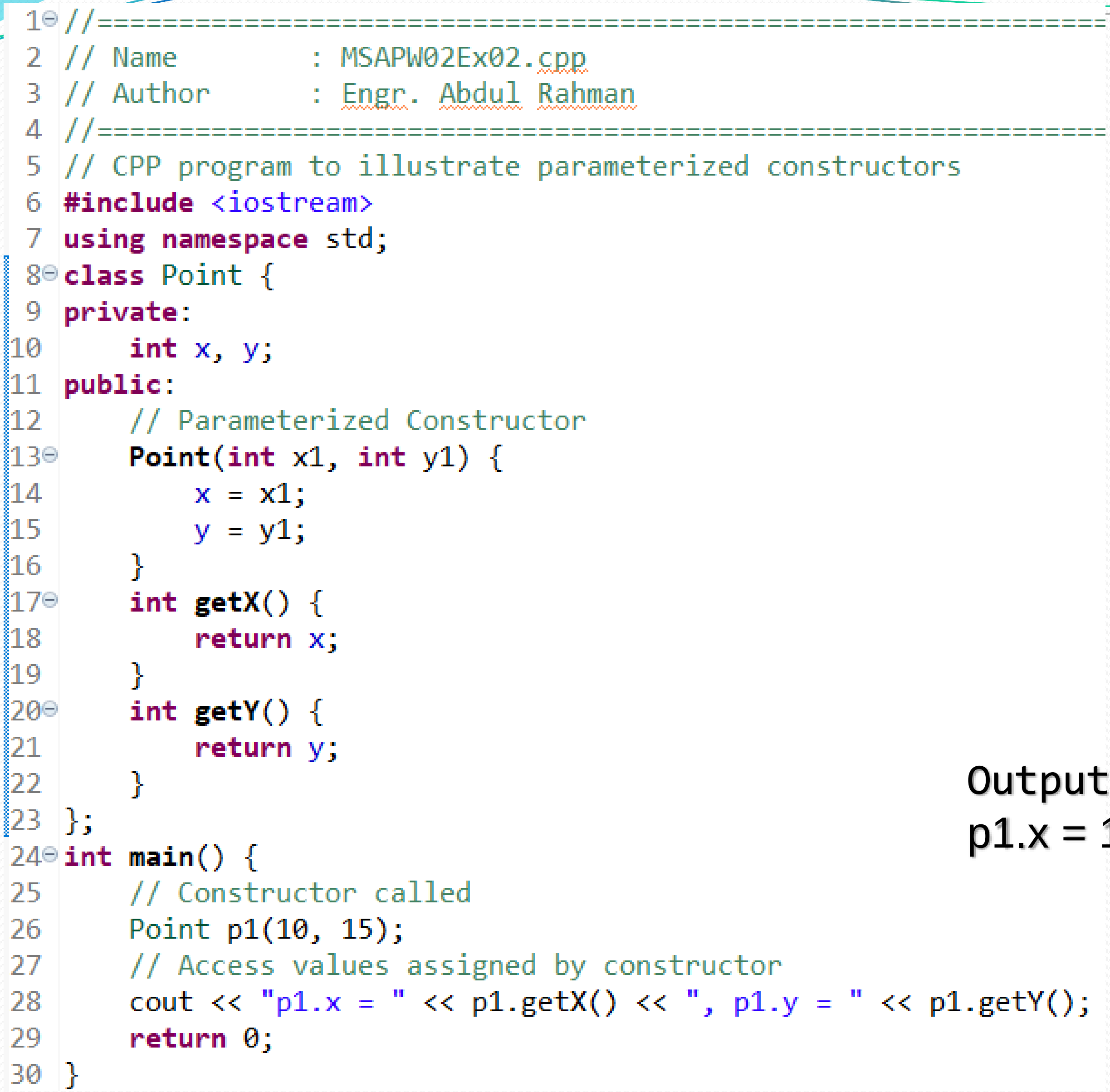


```cpp
//============================================================
// Name        : MSAPW02Ex01.cpp
// Author      : Engr. Abdul Rahman
//============================================================
// Cpp program to illustrate the
// concept of Constructors
#include <iostream>
using namespace std;

class construct {
public:
    int a, b;
    // Default Constructor
    construct() {
        a = 10;
        b = 20;
    }
};

int main() {
    // Default constructor called automatically
    // when the object is created
    construct c;
    cout << "a: " << c.a << endl
         << "b: " << c.b;
    return 0;
}
```

Output:

```
a: 10
b: 20
```

Ex02: parameterized constructors

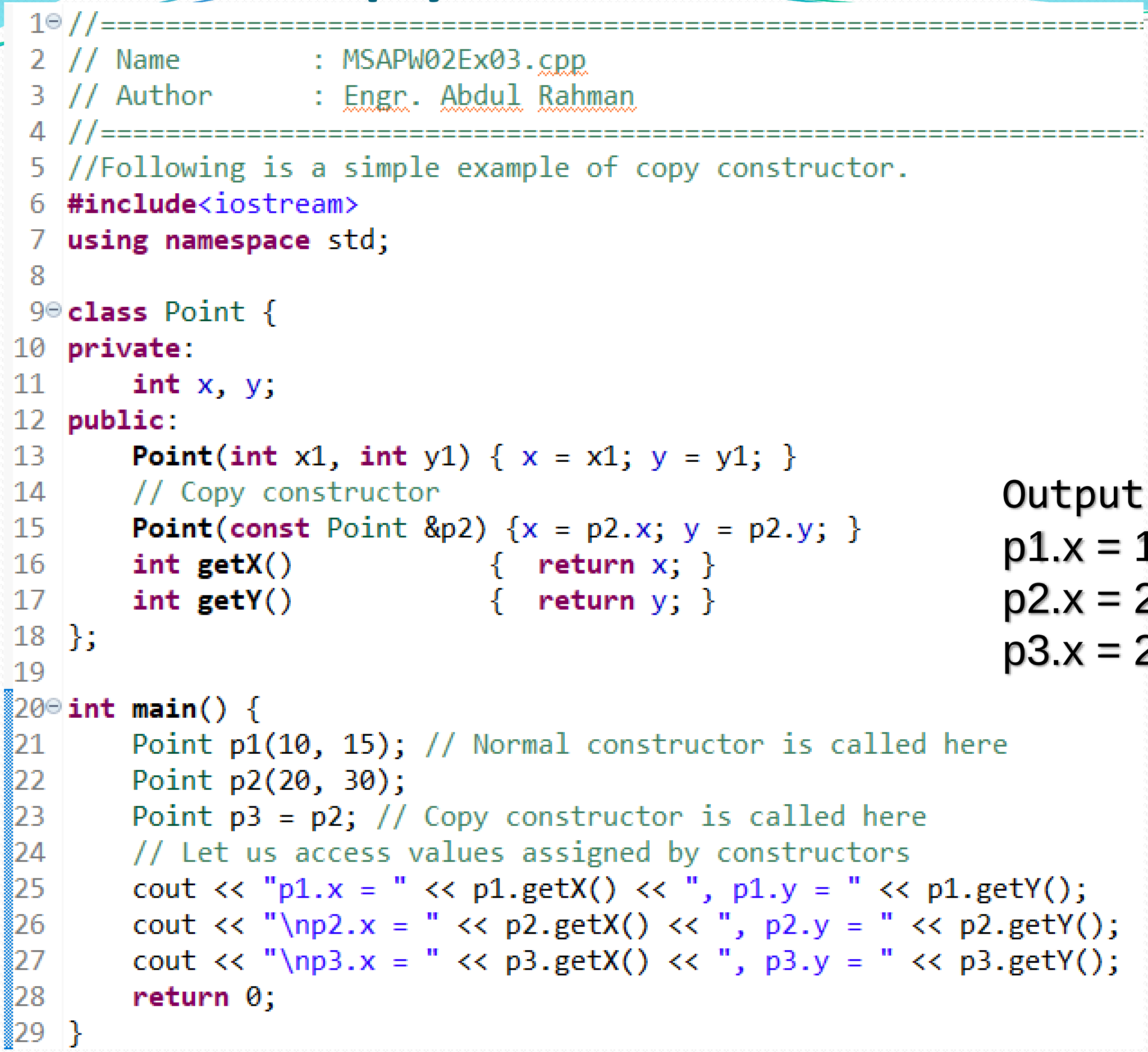


```cpp
//==========================================================================
// Name          : MSAPW02Ex02.cpp
// Author        : Engr. Abdul Rahman
//==========================================================================
// CPP program to illustrate parameterized constructors
#include <iostream>
using namespace std;
class Point {
private:
    int x, y;
public:
    // Parameterized Constructor
    Point(int x1, int y1) {
        x = x1;
        y = y1;
    }
    int getX() {
        return x;
    }
    int getY() {
        return y;
    }
};
int main() {
    // Constructor called
    Point p1(10, 15);
    // Access values assigned by constructor
    cout << "p1.x = " << p1.getX() << ", p1.y = " << p1.getY();
    return 0;
}
```

Output:

```
p1.x = 10, p1.y = 15
```

Ex03: copy constructors

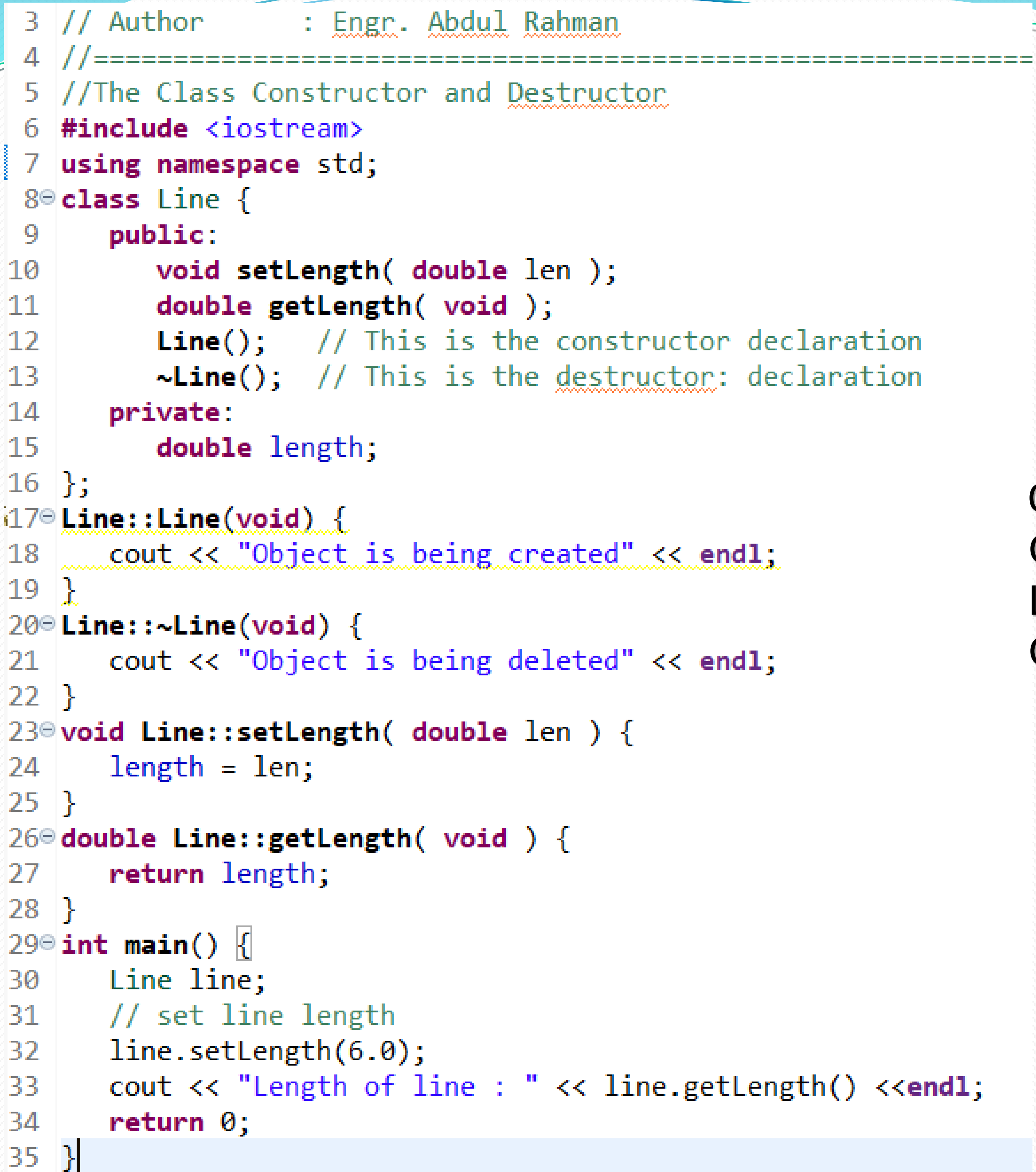


```cpp
//================================================================
// Name        : MSAPW02Ex03.cpp
// Author      : Engr. Abdul Rahman
//================================================================
//Following is a simple example of copy constructor.
#include<iostream>
using namespace std;

class Point {
private:
    int x, y;
public:
    Point(int x1, int y1) { x = x1; y = y1; }
    // Copy constructor
    Point(const Point &p2) {x = p2.x; y = p2.y; }
    int getX()            {  return x; }
    int getY()            {  return y; }
};

int main() {
    Point p1(10, 15); // Normal constructor is called here
    Point p2(20, 30);
    Point p3 = p2; // Copy constructor is called here
    // Let us access values assigned by constructors
    cout << "p1.x = " << p1.getX() << ", p1.y = " << p1.getY();
    cout << "\np2.x = " << p2.getX() << ", p2.y = " << p2.getY();
    cout << "\np3.x = " << p3.getX() << ", p3.y = " << p3.getY();
    return 0;
}
```

Output:

```
p1.x = 10, p1.y = 15
p2.x = 20, p2.y = 30
p3.x = 20, p3.y = 30
```

Ex04: constructor & destructor



```cpp
// Author       : Engr. Abdul Rahman
//==================================================================
//The Class Constructor and Destructor
#include <iostream>
using namespace std;
class Line {
   public:
      void setLength( double len );
      double getLength( void );
      Line();   // This is the constructor declaration
      ~Line();  // This is the destructor: declaration
   private:
      double length;
};
Line::Line(void) {
   cout << "Object is being created" << endl;
}
Line::~Line(void) {
   cout << "Object is being deleted" << endl;
}
void Line::setLength( double len ) {
   length = len;
}
double Line::getLength( void ) {
   return length;
}
int main() {
   Line line;
   // set line length
   line.setLength(6.0);
   cout << "Length of line : " << line.getLength() <<endl;
   return 0;
}
```

Output:

```
Object is being created
Length of line : 6
Object is being deleted
```