Xilinx Zynq FPGA, TI DSP, MCU 기반의 프로그래밍 및 회로 설계 전문가 과정

#70

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```
siyun@siyun-CR62-6M:~/my_proj$ ./a.out
0
2002
siyun@siyun-CR62-6M:~/my_proj$ cat friend.cpp
#include <iostream>
using namespace std;

class Counter
{
        int val;
public:
        Counter(void)
        {
                val =0;
        }
        void Print(void)
        {
                cout << val << endl;
        }
        friend void SetVal(Counter& c, int val);
};

void SetVal(Counter& c, int val)
{
        c.val = val;
}

int main(void)
{
        Counter cnt;
        cnt.Print();
        SetVal(cnt,2002);
        cnt.Print();
        return 0;
}
```

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

class A
{
private:
        int data;
        friend class B;
};

class B
{
public:
        void SetData(A& a, int data)
        {
                a.data = data;
        }
};
```

```
siyun@siyun-CR62-6M:~/my_proj$ vi copy.cpp
siyun@siyun-CR62-6M:~/my_proj$ g++ copy.cpp
siyun@siyun-CR62-6M:~/my_proj$ ./a.out
A() Call
A(int i) Call
A(const A& a) Call
siyun@siyun-CR62-6M:~/my_proj$ cat co
cat: co: No such file or directory
siyun@siyun-CR62-6M:~/my_proj$ cat copy.cpp
#include <iostream>
using namespace std;

class A
{
public:
        A(void)
        {
                cout << "A() Call" << endl;
        }
        A(int i)
        {
                cout << "A(int i) Call" << endl;
        }
        A(const A&a)
        {
                cout << "A(const A& a) Call" << endl;
        }
/* A&a 자기 참조 구조체
        A&a obj2가 복사가 됨 저런 객체를 생성자를 받을때 저런 형식으로 받음 */
};

int main(void)
{
        A obj1;
        A obj2(10);
        A obj3(obj2);

        return 0;
}
```

```
siyun@siyun-CR62-6M:~/my_proj$ vi copy2.cpp
siyun@siyun-CR62-6M:~/my_proj$ g++ copy2.cpp
siyun@siyun-CR62-6M:~/my_proj$ ./a.out
10 20
10 20
siyun@siyun-CR62-6M:~/my_proj$ vi copy2.cpp
siyun@siyun-CR62-6M:~/my_proj$ cat copy2.cpp
#include <iostream>
using namespace std;

class Point
{
        int x,y;

public:
        Point(int _x, int _y)
        {
                x= _x;
                y= _y;
        }

        void ShowData(void)
        {
                cout << x << ' ' << y << endl;
        }
};

int main(void)
{
        Point p1(10,20);
        Point p2(p1);

        p1.ShowData();
        p2.ShowData();
        return 0;
}
```

```
siyun@siyun-CR62-6M:~/my_proj$ vi copyconstructcase2.cpp
siyun@siyun-CR62-6M:~/my_proj$ g++ copyconstructcase2.cpp
siyun@siyun-CR62-6M:~/my_proj$ ./a.out
A(inti) Call
A(const A& a) Call
val: 30
siyun@siyun-CR62-6M:~/my_proj$ cat copyconstructcase2.cpp
#include <iostream>
using namespace std;

class A
{
        int val;
public:
        A(int i)
        {
                cout << "A(inti) Call" << endl;
                val = i;
        }
        A(const A& a)
        {
                cout << "A(const A& a) Call" << endl;
                val = a.val;
        }
        void ShowData(void)
        {
                cout << "val: " << val << endl;
        }
};

        void function(A a)
        {
                a.ShowData();
        }

int main(void)
{
        A obj(30);
        function(obj);
        return 0;
}
siyun@siyun-CR62-6M:~/my_proj$
```

```
siyun@siyun-CR62-6M:~/my_proj$ vi overloading.cpp
siyun@siyun-CR62-6M:~/my_proj$ g++ overloading.cpp
siyun@siyun-CR62-6M:~/my_proj$ ./a.out
3 4
13 14
siyun@siyun-CR62-6M:~/my_proj$ cat overloading.cpp
#include <iostream>
using namespace std;

class Point
{
private:
        int x,y;
public:
        Point(int _x =0, int _y= 0) : x(_x),y(_y) {}
        void ShowPosition(void);
        void operator + (int val);
};

void Point::ShowPosition(void)
{
        cout << x << " " << y << endl;
}

void Point::operator+(int val)
{
        x+= val;
        y += val;
}

int main(void)
{
        Point p(3,4);
        p.ShowPosition();

        p.operator+(10);
        p.ShowPosition();
        return 0;
}
```

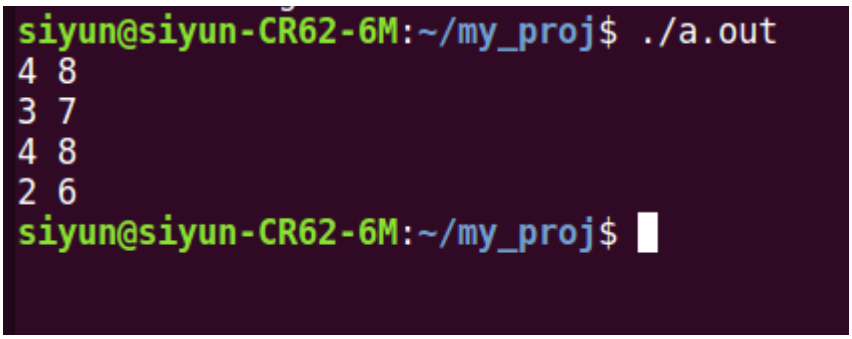
```
siyun@siyun-CR62-6M:~/my_proj$ vi overloading2.cpp
siyun@siyun-CR62-6M:~/my_proj$ g++ overloading2.cpp
siyun@siyun-CR62-6M:~/my_proj$ ./a.out
4 9
siyun@siyun-CR62-6M:~/my_proj$ cat overloading2.cpp
#include <iostream>
using namespace std;

class Point
{
private:
        int x,y;
public:
        Point(int _x = 0, int _y = 0) : x(_x), y(_y) {}
        void ShowPosition(void);
        Point operator + (const Point& p);
};

void Point::ShowPosition(void)
{
        cout << x << " " << y << endl;
}

Point Point::operator+(const Point& p)
{
        Point temp(x + p.x,y + p.y);
        return temp;
}

int main(void)
{
        Point p1(1,2);
        Point p2(3,7);
        Point p3 = p1 + p2;
        p3.ShowPosition();
        return 0;
}
```




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

class Point
{
private:
  int x,y;
public:
Point(int _x = 0,int _y = 0) : x(_x),y(_y) {}
void ShowPosition(void);
Point& operator++(void);
friend Point& operator--(Point& p);
};

void Point::ShowPosition(void)
{
cout << x << " " << y << endl;
}

Point& Point::operator++(void)
{
x++;
y++;
return *this;
/*thils = 자기자신 */
}

Point& operator--(Point& p)
{
p.x--;
p.y--;
return p;
}

int main(void)
{
Point p(3,7);
++p; /*전위 연산자
++p , p++ 다르다 전위 연산자이면 인자로 void 후위면 int 로 약속
friend 는 예외 */
p.ShowPosition();

--p; /*친구이니까 하나의 함수가 되었다.*/
p.ShowPosition();

++(++p); /* ++(4,8)= 5,9 */
p.ShowPosition();
```

```
--(--p);
p.ShowPosition();

return 0;
}
```

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

class Point
{
private:
int x,y;
public:
Point(int _x = 0, int _y = 0) : x(_x),y(_y) {}
void ShowPosition(void);
Point& operator++(void);
Point operator++(int);
};

void Point::ShowPosition(void)
{
cout << x << " " << y << endl;
}

Point& Point::operator++(void)
{
x++;
y++;
return *this;
}

Point Point::operator++(int)
{
Point temp(x,y);
// ++(*this);
x++;
y++;
return temp;
}

int main(void)
{
Point p1(3,7);
(p1++).ShowPosition();
p1.ShowPosition();

Point p2(33,77);
(++p2).ShowPosition();
p2.ShowPosition();

return 0;
}
```

```
siyun@siyun-CR62-6M:~/my_proj$ vi 후위.cpp
siyun@siyun-CR62-6M:~/my_proj$ g++ 후위.cpp
siyun@siyun-CR62-6M:~/my_proj$ ./a.out
3 7
4 8
34 78
34 78
siyun@siyun-CR62-6M:~/my_proj$
```

```
siyun@siyun-CR62-6M:~/my_proj$ vi operator3.cpp
siyun@siyun-CR62-6M:~/my_proj$ g++ operator3.cpp
siyun@siyun-CR62-6M:~/my_proj$ ./a.out
6 10
siyun@siyun-CR62-6M:~/my_proj$ cat operator3.cpp
#include <iostream>
using namespace std;

class Point
{
private:
        int x,y;
public:
        Point(int _x = 0, int _y = 0) : x(_x),y(_y) {}
        void ShowPosition(void);
        Point operator+(int val);
};

void Point::ShowPosition(void)
{
        cout << x << " " << y << endl;
}

Point Point::operator+(int val)
{
        Point temp(x + val, y + val);
        return temp;
}

int main(void)
{
        Point p1(3,7);
        Point p2 = p1 + 3;
        p2.ShowPosition();
        return 0;
}
```

```
siyun@siyun-CR62-6M:~/my_proj$ vi 3+operator.cpp
siyun@siyun-CR62-6M:~/my_proj$ g++ 3+operator.cpp
siyun@siyun-CR62-6M:~/my_proj$ ./a.out
6 10
13 17
siyun@siyun-CR62-6M:~/my_proj$ cat 3+operator.cpp
#include <iostream>
using namespace std;

class Point
{
private:
        int x,y;
public:
        Point(int _x = 0, int _y = 0) : x(_x),y(_y) {}
        void ShowPosition(void);
        Point operator+(int val);
        friend Point operator+(int val, Point& p);
};

void Point::ShowPosition(void)
{
        cout << x << " " << y << endl;
}

Point Point::operator+(int val)
{
        Point temp(x + val, y + val);
        return temp;
}

Point operator+(int val, Point& p)
{
        return p + val;
}

int main(void)
{
        Point p1(3,7);
        Point p2 = p1 + 3;
        p2.ShowPosition();

        Point p3 = 7 + p2;
        p3.ShowPosition();
        return 0;
}
```

```
siyun@siyun-CR62-6M:~/my_proj$ vi template.cpp
siyun@siyun-CR62-6M:~/my_proj$ g++ template.cpp
siyun@siyun-CR62-6M:~/my_proj$ ./a.out
30
3.3
siyun@siyun-CR62-6M:~/my_proj$ cat template.cpp
#include <iostream>
using namespace std;

template <typename T>
T Add(T a, T b)
{
        return a + b;
}

int main(void)
{
        cout << Add(10,20) << endl;
        cout << Add(1.1,2.2) << endl;
        return 0;
}
```

```
siyun@siyun-CR62-6M:~/my_proj$ vi template.cpp
siyun@siyun-CR62-6M:~/my_proj$ g++ template.cpp
siyun@siyun-CR62-6M:~/my_proj$ ./a.out
30
3.3
Add('a', '1') = 
siyun@siyun-CR62-6M:~/my_proj$ vi template.cpp
siyun@siyun-CR62-6M:~/my_proj$ g++ template.cpp
siyun@siyun-CR62-6M:~/my_proj$ ./a.out
30
3.3
Add('a', '1') = -110
siyun@siyun-CR62-6M:~/my_proj$ cat template.cpp
#include <iostream>
#include <stdio.h>
using namespace std;

template <typename T>
T Add(T a, T b)
{
        return a + b;
}

int main(void)
{
        cout << Add(10,20) << endl;
        cout << Add(1.1,2.2) << endl;
        printf("Add('a', '1') = %d\n", Add('a', '1'));
        return 0;
}
```