Access Modifier

Private -Public & Public-Private

```cpp
#include <iostream>

using namespace std;

class Sample

{

  private:

  void read(); // Private Member Function


  public:

  void display(); // Public Member Function

};


void Sample::read()

      {

          cout<<"I am private class";

      }


void Sample::display()

      {

          cout<<"I am a public class";

      }


int main()

      {

          Sample S;
```

S.display();

S.read(); // Generates Error as we are calling Private Member Function

return (0)

}

Explaination:-

Generates Error:-

```
main.cpp:36:12: error: 'void Sample::read()' is private within this context
   36 |     S.read();
      |            ^
main.cpp:22:6: note: declared private here
   22 | void Sample::read()
      |      ^~~~~~
```

Solution:-

Solution 1:-

Private member Function should be called from Public Member Function.

For Example:-

void Sample::read() //Private Member Function

{

   cout<<"I am private class"<<endl;

}

void Sample::display() // Public Member Function

```
{
    read(); // Calling Private Member function from Public Member Function
    cout<<"I am a public class"<<endl;
}
```

Output:-

I am private class

I am a public class

Solution 2:- Using Friend Function

```
#include <iostream>
using namespace std;
class Member
    {
            private:
            int private_mem=0; // private member


            public:
            friend int func (Member);//friend Function


    };
        int func (Member m)
        {
            m.private_mem=5;   // Friend Function Accessing Private Member
            return m.private_mem;
        }


        int main()
```

```
{

    Member m;

    cout<< "Friend Function changed value of Private Member::"<<func(m);

    return(0);

}
```

Output of the following Program:-

Friend Function changed value of Private Member from 0 to :: 5

2)Protected -Public&Public-Protected

```
#include <iostream>

using namespace std;

class Sample

{

  protected:

  void read();//Protected Member Function


  public:

  void display();//Public Member Function

};


void Sample::read()

{

    cout<<"I am protected class"<<endl;

}
```

```cpp
void Sample::display()
{
    cout<<"I am a public class"<<endl;
}

int main()
{
    Sample S;
    S.display();
    S.read();// Generates Error as calling Protected Member Function
    return (0);
}
```

```
error: 'void Sample::read()' is protected within this context
   37 |     S.read();
      |             ^
main.cpp:22:6: note: declared protected here
   22 | void Sample::read()
      |      ^~~~~~
```

Solution

Solution 1:-Calling Protected Member function from Public Member Function

```cpp
void Sample::read() // Protected Member Function
{
    cout<<"I am protected class"<<endl;
}
```

```
void Sample::display() //Public Member Function
{
   read();  // Calling Protected Member Function from Public Member Function
    cout<<"I am a public class"<<endl;
}
```

Output of the following Program:-

I am protected class

I am a public class

Solution 2:- Using Friend Function

```
#include <iostream>
using namespace std;
class Member
{
   protected:
   int protected_mem=0; //protected Member
   public:
   friend int func(Member);//friend Function


};
int func (Member m)
{
   m.protected_mem=5; //friend Function accessing Protected Member
   return m.private_mem;
}
```

```cpp
int main()
{
    Member m;
    cout<<"Friend Function changed value of Protected Member::"<<func(m);
    return(0);
}
```

Output:-

Friend Function changed value of Protected Member from 0 to :: 5

3) Private- Private

```cpp
#include <iostream>
using namespace std;
class Sample
{
 private:
 void read();
 void display();
};

void Sample::read()
{
    cout<<"I am private class"<<endl;
}
```

```cpp
void Sample::display()

{


    cout<<"I am a public class"<<endl;

}


int main()

{

    Sample S;

    S.display();//Generates Error as calling Private Member Function

    S.read();//Generated Error as Calling Private Member Function

    return (0);

}
```

```
error: 'void Sample::display()' is private within this context

    34 |     S.display();

       |                ^

main.cpp:25:6: note: declared private here

    25 | void Sample::display()

       |      ^~~~~~

main.cpp:35:12: error: 'void Sample::read()' is private within this context

    35 |     S.read();

       |                ^

main.cpp:20:6: note: declared private here

    20 | void Sample::read()

       |      ^~~~~~
```

Solution:-

Program should contain 1 public function to access any Private Function

So, one of the Private Function should be converted into Public Member Function.

For Example:-

"FROM"

private:

  void read();

  void display();

  "TO"

private:

  void read();

  public:

  void display();

Outputs:-

I am private class

I am a public class