

# ACA Summer School 2014

## Advanced C++

### Quiz 1

1. Explain what is an object?
2. Explain about inheritance?
3. Why are constructors required?
4. What will be the output of the following program. Explain.

```
#include <iostream>
using namespace std;
class Book
{
    int PageCount;
    int CurrentPage;
public:
    // Constructor
    Book( int NumPages);
    // Destructor
    ~Book(){
        cout<<"I completed this book\n";
    } ;
    void bookMark( int PageNumber);
    int getBookMark( void );
};
Book::Book( int NumPages){
    PageCount = NumPages;
    cout<<"I have started reading a new book\n";
}
```

```

void Book::bookMark( int PageNumber){
    CurrentPage=PageNumber;
}
int Book::getBookMark( void ){
    return CurrentPage;
}
int main() {
    Book HP8(498) ;
    HP8.bookMark( 56 ) ;
    return 0;
}

```

5. Extend the above Book class so that Book class also contains publisher name, author name and book name. Now create three more constructors in the new Book class, so that we can create new objects when:
  - (a) We have all the information about a book
  - (b) We don't know the publisher's name and number of pages in the book
  - (c) We don't have any information about the book ( Default constructor)

6. You have points in a 2 dimensional space. Create a point class with just one constructor which takes both x and y coordinate. Also create a method in the point class which takes a point as an argument and returns the squared distance between the two points.

```

7. class X {
    public: int a;
    protected: int b;
    private: int c;
    int fx();
};
class Y : public X {
    public: int f();
};
class Z : protected X {
    public: int g();
};
class W : private X {
    public: int h();
};
int main() {
    X x;
    Y y;
    Z z;
    W w;
}

```

Answer the following questions based on code above:

- a) Which out of x.a,x.b,x.c are accessible inside main()
- b) Which out of y.a,y.b,y.c are accessible inside main()
- c) Which out of z.a,z.b,z.c are accessible inside main()
- d) Which out of w.a,w.b,w.c are accessible inside main()
- e) Which out of a,b,c are accessible inside f()
- f) Which out of a,b,c are accessible inside g()
- g) Which out of a,b,c are accessible inside h()
- h) Which out of a,b,c are accessible inside fx()

8. Explain the output of the following code:

```
#include<iostream>
using namespace std;
class A {
public:
    void f() {
        cout << "A::f" << endl;
    }
    virtual void g() {
        cout << "A::g" << endl;
    }
};
class B : public A {
public:
    void f() {
        cout << "B::f" << endl;
    }
    virtual void g() {
        cout << "B::g" << endl;
    }
};
int main(int argc, char** argv) {
    A a;
    B b;
    A* aPtr = &a;
    B* bPtr = &b;
    aPtr->f();
    aPtr->g();
    bPtr->f();
    bPtr->g();
    return 0;
}
```