Homework 4

Due on December 3, 2024

1. Given the program, which of the following class member accesses are legal? Why?

#include <iostream>using namespace std;class DayOfYear{public: void input(); void output();// other public members private: int month; int day; // other private members

};int main(){

DayOfYear birthDay;

birthDay.input(); // a)

birthDay.day = 25; // b)

cout << birthDay.month; // c)

cout << birthDay.output(); // d)

if(birthDay.month == 1) // e)

cout << "January\n";

}

1. Which of the following are legal accesses to the class or struct members? Assume each is outside of the class member definitions. Explain your answers.

struct S class C class D

{ { {

int x; int x; public:

int y; int y; int x;

} private: int y;

S s; int z; private:

}; int z;

C c; };

D d;

a) s.x

b) c.x

c) d.x

d) c.z

e) d.z

1. Why is it an error to add a const modifier, as shown to the declaration for the member function input given here?

class BankAccount

{

public:

void input( ) const;

// other members

};

1. Explain why data members, in particular should be placed in the private section of a class.
2. Given the definitions below. Rewrite the definition of this class so that functions f()const and g(const A& x) are inline.

const int x = 17;

class A

{

public:

A( );

A(int n);

int f( ) const;

int g(const A& x);

private:

int i;

};

1. How many times is the following code invoked by the call recursive(4)? Justify your answer.

void recursive( int i )

{

using namespace std;

if (i < 8)

{

cout << i << " ";

recursive(i);

}

}

* 1. 2
  2. 4
  3. 8
  4. 32
  5. This is an infinite recursion.

1. Give the output of the recursive function below when called with an argument of 5. Explain your answer.

void recursive( int i )

{

using namespace std;

if ( i < 8 )

{

i++;

recursive(i);

cout << i << " ";

}

}

* 1. 6 7 8
  2. 5 6 7
  3. 8 7 6
  4. 7 6 5
  5. None of the above. This is an infinite recursion if the function is called with argument 5.

1. In the template prefix, template<class T>, what kind of variables is the parameter T? Explain your answer.
2. Describe a strategy for writing template functions.
3. For the following template declaration of the following function,

template<class T> void problem\_6 (T object);

* 1. Give a statement that causes the compiler to generate a function that passes int values to the function problem\_6
  2. Give an equivalent function declaration (prototype) for the function generated by this usage.