Functions

1. Given:

#include <iostream>

using std::cout;

void f(signed char c) { cout << “Signed char\n”; }

void f(unsigned char c) {cout << “Unsigned char\n”; }

int main() {

char c1 = ‘a’;

f(c1);

}

a) The output is: “Signed char\n”.

b) The output is: “Unsigned char\n”.

c) The output is implementation dependant.

d) There is a compilation error. Why?

e) There is a link error. Why?

(2) Given file A.cpp:

#include <iostream>

void f(int) { std::cout << “f(int)”; }

And file B.cpp:

#include <iostream>

void f(double) { std::cout << “f(double)”; }

int main() {

f(3);

}

a) The output is “f(int)”.

b) The output is “f(double)”.

c) There is a compilation error. Why?

d) There is a link error. Why?

3) Given the file header.h:

#include <iostream>

void f(int d);

And the file A.cpp:

#include “header.h”

void f(int d = 10) {std::cout << d << “\t”; }

And the file B.cpp:

#include “header.h”

int main() {

f();

f(5);

}

a) The output is “10 5”.

b) The output is “??? 5”, where ??? is undefined.

c) There is a compilation error. Why?

d) There is a link error. Why?

4) Given:

#include <iostream>

using std::cout;

void f(float) { cout << “f(float)”; }

void f(long double) {cout << “f(long double)”; }

int main() {

f(2.0);

}

a) The output is “f(float)”.

b) The output is “f(long double)”.

c) There is an ambiguity when calling f(2.0). Due to floating point promotions.

d) There is a link error.

5) Given:

#include <iostream>

using std::cout;

using std::endl;

void f(int&) { cout << “A”; }

void f(const int&) {cout << “B”; }

int main() {

int i = 10;

const int ci = 11;

f(i);

f(ci);

}

a) The output is “AA”.

b) The output is “AB”.

c) The output is “BA”.

d) The output is “BB”.

e) There is a compilation error. Why?

f) There is a link error. Why?

6) Given:

int f() { return 1; }

double f() { return 2.5; }

int main() {

int ret = f();

return ret ;

}

a) The returned value is 1.

b) The returned value is 2.

c) The returned value is 3.

d) There is a compilation error. Why?

e) There is a link error. Why?

7) Given:

#include <iostream>

void f(int) { std::cout << "int"; }

void f(double) { std::cout << "double"; }

int main() {

char a = 'a';

f(a);

}

a) The output is "int".

b) The output is "double".

c) There is a compilation error. Why?

d) There is a link error. Why?

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(8) Write a sort() function that takes a pointer to a contiguous block of ints and its size, and sort them incrementally

(9) Create a function that takes an argument by value as a **const**; then try to change that argument in the function body.

(10) Create two identical functions, **f1( )** and **f2( )**. Inline **f1( )** and leave **f2( )** as an non-inline function. Use the Standard C Library function **clock( )** that is found in **<ctime>** to mark the starting point and ending points and compare the two functions to see which one is faster. You may need to make repeated calls to the functions inside your timing loop in order to get useful numbers.

(11) Define a function that takes a **double** argument and returns an **int**. Create and initialize a pointer to this function, and call the function through your pointer.

(12) Declare a pointer to a function taking an **int** argument and returning a pointer to a function that takes a **char** argument and returns a **float**.