Current Assignments

- Project 3 has been posted, due next Tuesday.

  Write a contact manager.

- Homework 6 will be posted this afternoon and will be due Friday.

  More pointers and arrays.

Exam 2

- Functions (templates overloading etc.)
- Recursion
- Static Arrays
- Pointers (including function pointers)
- No Sorting

Sample Problem

Find the syntax errors:

```
Int foo( int int );

Int main()
{
    foo( 3, 4 )
    return 0;
}

Int foo( x, y )
{
    return x + y;
}
```

Sample Problem

Find the syntax errors:

```
float foo( int 4, int 5 );

int main()
{
    foo( 3.0, 4 );
    return 0;
}

int foo( float x, float y )
{
    return x + y;
}
```

Sample Problem

Find the syntax errors:

```
float foo( int x = 5.0 , int y = 5.0 );

int main()
{
    foo( 3.0 );
    return 0;
}

float foo( float x, float y )
{
    return x + y;
}
```

Sample Problem

Find the syntax errors:

```
float foo( &int x = 5 , &int y = 5 );

int main()
{
    foo( 3 );
    return 0;
}

float foo( &int x, &int y )
{
    return x + y;
}
```

Sample Problem

Find the syntax errors:

```
float foo( int& x = 5 , int& y = 5 );

int main()
{
    foo( 3 );
    return 0;
}

float foo( int& x, int& y )
{
    return x + y;
}
```

Sample Problem

Find the syntax errors:

```
template<typename T> T foo( T x, T y )

int main()
{
    foo( 3.0 );
    return 0;
}

T foo( T x, T y )
{
    return x + y;
}
```

Sample Problem

Find the syntax errors:

```
#include <iostream>
using namespace std;
int main()
{
    int y = 5;
    int* x = NULL;
    x = y&;
    cout << (*x) << “==“ << y << endl;
    return 0;
}
```

Sample Problem

Find the syntax errors:

```
#include <iostream>
using namespace std;
int main()
{
    int y = 5;
    int x = NULL;
    x = &y;
    cout << x << “==“ << &y << endl;
    return 0;
}
```

Sample Problem

Find the syntax errors:

```
#include <iostream>
using namespace std;
int main()
{
   int[10] y = {5};
   cout << y[-1] << “==“ << y[10] << endl;
   return 0;
}
```

Sample Problem

Find the syntax errors:

```
#include <iostream>
using namespace std;
int main()
{
   int array[11.5];
   return 0;
}
```

Sample Problem

Find the syntax errors:

```
#include <iostream>
using namespace std;
int main()
{
   constant int x;
   int array[x];
   return 0;
}
```

Sample Problem

Find the syntax errors:

```
#include <iostream>
using namespace std;
int main()
{
    int z;
    int* x;
    int y[10][2];
    x = y[1][2];       // can't assign int to int*
    x = &(y[5][0]);  // x = &(y[5]) only works on some
    compilers
    z = y[4];          // can't assign an int* to an int
    return 0;
}
```

Sample Problem

Find the logic error:

```
#include <iostream>
using namespace std;
int main()
{
    int array[100];
    for( int i = 1; i <= 100; i++  )
    {
          array[i] = 2*i;
    }
}
```

Sample Problem

Find the logic error:

```
#include <iostream>
using namespace std;
void foo( int* x );

int main()
{
    int* x = NULL;
    foo(x);
    cout << (*x) << endl;
}
void foo( int* x )
{
    int y = 6;
    x = &y; // Returning the address of a local variable
}
```

Sample Problem

Find the logic error:

```
#include <iostream>
using namespace std;
int* foo();

int main()
{
    cout << foo() << endl;
}
int* foo()
{
    int a[10] = {0};
    return a;  // a is the address of array a, its really a pointer
}
```

Sample Problem

What does this code snippet print:

```
int array[4][3];
for( int i = 0; i < 3; i++ )
{
    for( int j = 0; j < 4; j++ )
    {
        array[j][i] = i*j;
    }
    cout << array[i][i];
}
```

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Sample Problem

What does this code snippet print:

```
char array[] = “this is\0a test”;
for( int i = 0; array[i] != ‘\0’ ; i++ )
{
        cout << array[i];
}
```

This is

Sample Problem

What does this code snippet print:

```
char* foo( char* a1 );
char* bar( char* a1 );
int main()
{
    char test[] = "test1";
    cout << test << “ “ << foo( test ) << “ “ << bar( test ) << endl;
    return 0;
}
char* foo( char* a1 )
{
    a1[4] = '2';      return a1;
}
char* bar( char* a1 )
{
    a1[4] = '3';      return a1;
}
```

test1 test2 test3\n

Sample Problem

What does this code snippet print:

```
void foo( int x );
void bar( int& x);
int main()
{
    int y = 5;
    cout << y << endl;
    foo(y);
    cout << y << endl;
    bar(y);
    cout << y << endl;
    return 0;
}

void foo( int y )
{
    y = y+1;
}

void bar( int& y )
{
    y = y+1;
}
```

5

5

6

Sample Problem

What does this code snippet print:

```
int foo( int x );

int main()
{
    foo(-2);

    return 0;
}

int foo( int y )
{
    if ( y < 4 )
    {
        cout << y << " ";
        y = foo( y + 1);
    }
    cout << y << " ";
    return y;
}
```

-2 -1 0 1 2 3 4 4 4 4 4 4 4

Sample Problem

What does this code snippet print:

```
char* foo( char* y, const int size );

int main()
{
    const int size = 15;
    char* test = "This is a test";

    cout << foo( test, size );

    return 0;
}

char* foo( char* y, const int size )
{
    char x[ size ];
    for ( int i = 0; i < size; i++ )
    {
        x[i] = y[size-i-2];
    }
    x[size - 1] = '\0'; // Add a NULL character to the end
    return x;
}
```

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Sample Problem

What does this code print?

```
#include <iostream>
using namespace std;
float foo( float x = 4, float y = 3);
float bar( int x, float (*y) (float x = 4, float y = 3) );

int main()
{
    cout << bar( 4, foo ) << endl;
    return 0;
}
float foo( float x, float y)
{
    return (x/y);
}
float bar( int x, float (*y) (float x = 4, float y = 3) )
{
    return y( x );
}
```

Sample Problem

Write the definition for a function that given an array of 20 integers computes the median value.

Write a complete program that given an array returns a pointer to a copy of that array.

Write a recursive function to subtract one positive number from another.

Write an iterative function definition that concatenates two strings.

Write a recursive function definition to concatenate two strings.