int 0, B1, B2, B3, B4, ... instead?

What if you declared


{ output nastyerror, exit }

\[ ( ( ( I \geq 366 ) \land ( I = 0 ) ) \lor ( \text{can} \gg I) \lor \text{Now for all 0} \Rightarrow I \geq 366, B[I]=0. \]

\[ \text{for (I=0; I++; I>366) B[I]=0; } \]

... //

int B[366];

int I;

int 0, B1, B2, B3, B4, ... instead?

First data structure: Array

Administrative and course objectives: Read handout.

CSI 310: Lecture 1 (Updated for post 2003 use)
A rooted tree is a structure of nodes and arcs (pairs of nodes that

specify the order (q).)

(c) One arc from this tree's root to the root of each of the trees

with each other or the root. (and)

(0) Zero or more rooted trees, with no nodes or arcs in common

(has:

What is a tree?

(3) Elegant way to write programs; performance can be improved

with routine re-implementation if it's worth it.

(2) Powerful problem solving technique.

(1) Understanding, not just programming, data structures and

algorithms.

Reursion:

Pointers, Linked data structures.
Usually, RAM: Random Accessible Memory
which costs money.
Each variable is implemented by a separate piece of hardware
de like: cell, box, storage facility
synonyms: object, instance, memory location, location.

**VARIABLE**

Data is more important than executable code.

**MEANING** of data is required and will be graded.
**enough** Writing documentation of function interfaces and precise
**CS1310: CS Major Subj:** “Getting Your Program to Work” is **NOT**
variable.

Imports to a calculation. The calculated result can be stored in a

value in variables can be copied into variables or used as

stores.

A variable is a data structure. Its value is the data it currently

The variable is NOT THE SAME AS ITS VALUE

The value in the variable.

```
{  The value of N is 8.  //
      N + N = N
      Now the value of N is 3.  //
      Assignment stmt.  //
      The value of N is unpredictable
      That N!
    }
main()
```
value does change.

Each variable retains the identity it gets when it is

contenst (what it contains)

Synonyms for "value in a variable": The variable's state, its

changes the value it contains.

Streaming into a variable doesn't change the variable; storing

in the variable.

Copying or using a variable's value does not change the value

N is created. We cannot predict its value.

N is the same N.

N's value is now 3. N is the same N.

N's value is now 6. N's value changed. N did NOT.
together.

that is formed or composed of its individual variables, taken

It is useful to consider the WHOLE ARRAY as ONE VARIABLE

index. In C/C++ the indexes range from 0 to length-1.

Each element is selected for access using an integer, called an

adjacent addresses, like a row of houses on one city block.

The elements are located contiguously in memory, at

The number of elements (length of the array) is fixed.

(int, float, char, any other type...)

Each individual variable, called an element, has the same type

An array is a sequence of variables (plural) that:

Arrays' again.
// Get prices of stocks numbered 0 to 99
float price[100];

Statistics, such as prices of 100 different stocks:

```c
for (T = 0; T < 100; T++)
{ [T] M += cin
for (T = 0; T < 100; T++)
{ [T] W += cin
    int T;
    cout << "Type vector W:
    [T] W
    cin >> [T] W;
    cout << "Type vector L:
    [T] W
    cin >> [T] W;
    cout << "Type vector M:
    [T] W
    cin >> [T] W;
    double W[T][3], W
    sum dimensions. ++ code to add vector W and W:
```

What can you use arrays for?
Depending on how you tell where the end is...

... holds strings up to 99 or 100 chars long...  

char *mystring[100];

of char, declared:

One way to store/process string data is to use a C++ array

This is called string data.

...(Something New?)

Non-numerical "text" data, such as the contents of a word processed term paper, the text on a Web page, what you see "RIGHT HERE": R, I, G, H, T, etc.

...This prints each number and price, separated by 6 spaces.

{  
  cout << t << " " << price[4] << endl;

  for(t=0; t<100; t++)
  {
  cout << "Stock number price" << endl;

  from the Internet and store them in price[].
}  

}
C-strings are different from C++ strings you get from #include <string>

\$ \text{Not a (char \ W[1]) with:} \\
\text{The C-string "ABCDEFGHIJKLMNOPQRSTUVWXYZ" is stored in a LENGTH 5 byte,}
\text{Strings in char arrays terminated with \texttt{\textbackslash 0}, are called C-strings.}
\text{The null char is coded \texttt{\textbackslash 0}},
\text{In C/C++ the char \texttt{\textbackslash 0} is coded \texttt{\textbackslash A}},
\text{Not printtable value called the \texttt{\textbackslash null char}.}
\text{One way to tell where the end of a string is: Just after the last}
\text{element used for the string, the next element\texttt{\textbackslash 0}, value is the VERY}

cout << MYCHARRAY << endl;

Printing what you typed:

cin.getline(MYCHARRAY, 12);

Reading up to 11 characters you type on one input line:

//Holds a C-string with tenth up to 11
char MYCHARRAY[12];

C-string:

REQUIRED in CS1310: Declaring a variable that can hold a
like: cout << "Hello World";
C-strings are very easy to use. You have used them in CS1201 code

using namespace std;

#include <iostream>
then w, o, r, l, and finally d.

prints the characters, in order, H, then e, two T's, an o, a space,

cout >> "Hello World";

is easier to think about than

prints the string Hello World

cout >> "Hello World";

ONE C-string.

of char (sequence of char variables) is a single variable that holds

array

This example illustrates the usefulness of thinking that an array
void main()
{
    // Example main function
    // ...


```c
{  
return 0;

  cout >> "Goodbye. " >> endl;
}

else if (0 == strcmp(input, "quit"))
{
  cout >> "This is a wonderful program. " >> endl;
}

<

// from <cstdio>
int i = 0 == strcmp(input, "about")
{
  debug} cout << input >> endl;
}

while (cin >> get_input(input, INBUF_SIZE))
{

  char input[INBUF_SIZE];

  const int INBUF_SIZE = 12;
}

main()

Recognizing one-line commands:
```
end of main() function. // {
    return 0;
}
cout << "Input from cin failed. exiting" << endl; 
{
    }
cout << "Error Unknown Command, Try Again.\n" << endl; 
else // Each previous strcmp() returned non-zero.
{ return 0; }

while (finished) { //
    count ++; // A sorted string was printed.

    if (now, A[0..nch-1] is SORTED)
        // Now, A[1] has the smallest char from A[1..nch-1]
        {
            [[] A[i], A[j]]

            if (A[j] < A[i])
                for (j = i-1; j > nch; j++)
                    for (i=0; i < nch-1; i++)

                while (cin.getline(A, size) && A[0] != '\0.0', [ ]
        // const int size = 100; int nch, i, j; char A[size];
    }

    main()

    using namespace std;

#include <iostream>

//Selection sort demo: processes the array A.
Save a copy to help you begin future projects.

Pressing "enter" when you type more than 11 characters before
HAPPENS WHEN YOU type more than 11 characters before
Everybody ASAP: Write a program like this, and see WHAT
Savitch's textbook.
To get more details right now, read pages 183-187 of Main and
This program manipulates chars as if they were numbers!
under Linux during the remainder of this if you need it. have one, and get help from course staff about doing C++ programming Get an Academic Computing Linux cluster account ASAP if you don’t reading then. Lab 1 will use chapter 2 through sec. (2.3) We will cover chapters 1, 2 and 3 during the first 3 lectures, so start for function interfaces in the form of pre and post conditions. In this course, we will require and grade your writing of documentation via the links on my Lecture 01 web page. Next, we covered (in SPR2003) some of the Perl, Main's slides on pre and