General Computer Science for Engineers CISC 106 Lecture 28

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Lecture Overview

- Project 2 overview
- C++ data types (again)
- Scopes (Global, Inner, Outer)

Project 2: Itunes User Interface

- Work by yourself or in a team of 2
- Extra credit if done in C++
 - Harder!!

- Tests skills in sorting and searching
- Written report of two pages required
 - Serves as documentation for your work

Project 2: Overview

- Create a struct with artist, song information
 - Artist
 - Song Title
 - Size
 - Etc...
- Sort

- Artist or Song (A to Z, Z to A)
- Size
- User input (for menu option)
- Filter (by size and by artist)



C++ Data Types

- Integer
 - short, int, long (unsigned)
- Floating point
 - float, double, long double
- Logical
 - bool (values: true, false)
- Character
 - char
- Text
 - String ("Hello World")



C++ Data Types

unsigned short quantity = 127; short temperature = -10;

int carValue = 0; // always initialize variables!! carValue = 57000;

carValue = quantity;

quantity = carValue;



The variable **quantity** cannot store big numbers



C++ Data Types

```
char Letter = 'a';
```

```
string greeting = "This is a string";
```

```
greeting = Letter;
```

```
Letter = greeting;
```



The variable **Letter** cannot store strings; Think: A character is a string but a string is not a character.



C++ data types

Туре	Low	High	Digits of Precision	Bytes
char	-128	127	-	1
short	-32768	32767	-	2
int	-2147483648	2147483647	-	4
long	-2147483648	2147483647	-	4
float	3.4x10 ⁻³⁸	3.4x10 ³⁸	7	4
double	1.7x10 ⁻³⁰⁸	1.7x10 ³⁰⁸	15	8
long double	3.4x10 ⁻⁴⁹³²	3.4x10 ⁴⁹³²	19	10



Clicker time

C++ Scopes

- Curly braces {} introduces a new block
- Creates a Scope
- Functions create a scope
- Loops and if statements create a scope



C++ Scopes

. . .

// this for loop creates a scope for (...) {

for (...) {
 // variables created in first for loop scope
 // are not visible here



C++ Scopes

int main() {
 int x = 19; // x is known in all of main

if (x == 19) {
 int y = 20;
 cout << ``x + y is `` << x + y << endl;
}
// y is not visible here!</pre>



```
Inner versus Outer Scopes
int main() {
   int i = 0; // i is outer scope
  int j = 100;
  if (j > 0) {
     int i = 20;
     cout << "Inner i is " << i << endl:
   }
  cout << "Inner i is" << i << endl;
```



Global scope and :: operator

int i = 100; int main() {
 int i = 0; // i is outer scope

cout << "i in main is " << i << endl;

cout << "global i " << ::i << endl;

Coding Standards

- Always initialize your variables
- Define variables where used
- Pick names carefully

- Always use the :: (scope resolution operator) to access globals
- Avoid using variables of the same name for different purposes