C++ CS 1410 Exam 1 Cheat Sheet

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Terminology

Cin	is the same as input
Cout	is same as print
<< and >>	point to where the information is going to.
difference between the ++ being before the variable or after	++x adds 1 to the x variable before doing the math statement, x++ adds 1 after the math statement.
setprecision(3)	cout << setprecision(3) << 1.23456<< endl; 3 total numbers, 2 after the decimal =1.23
setprecision command with fixed notation	cout << fixed << setprecision(3) << 1.23456 << endl; 4 total numbers, 3 after the decimal = 1.235
Math Libraries	ceiling goes up to next int and floor goes to the int below ceil(3.5) = 4 floor(3.5)=3 Abs(-3.5) = 3.5
setw	sets the field witdth to be used on the display
function	a way to modularize code and make it reusable. They help us manage, reuse, and organize our code. must include return type, name, parameters and {}. int AddFive(int a) {return x+5}}

Terminology (cont)

parameter passing by value	aka pass by copy, modifies a copy of the variable so that original stays the same. int addfive(int a) { return a = a +5}; int b = 5; addfive(b); shows 5
parameter passing by reference	modifies the actual variable being passed in. void addfive(int& a) { a= a+5;} int b = 5; addfive(b); shows 10.

.h/.cpp

.h aka header file	allows us to link our program to library code #include "main.h"
.cpp	source code files - methods for the definitions listed in .h file are here
classes	Student class {} within .h file, have member variable and member functions. default visibility of private
class scope	private: only available within that function, public: available throughout the code and protected

.h/.cpp (cont)

Constructors	a member function of a class that is executed whenever we create new objects of that class, it is named after the class and gives our member variables values. student();
default constructor	creates an empty object, numeric values to 0, character and string values to blank "", and sets objects to empty. can be written in line or initialized list. Student() : id_(0), name_(""), email_(""){}
General Constructor	creates an object with user chosen values given to the member variables. can be in line or a list but not both. Student(int id, std::string name, std::string email) : id_(id), name_(name),-email_(email) {}
Setters	gets details from contructors either general or default and add them to the variables list. void SetId(int id);
Getters	a way for the user of the class to see the values without having direct access to them. int GetId() const {return id_;}

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.h/.cpp (cont)

structs	similar to class but can group several related variables in one place.

Loops

If statement	executes when the condition is true. double up on ifs and code executes for all true statements. if(force <10){}
else if	executes the first true statement. then skips the rest. else if(force < 25){}
for loops	(start, end, change) for(int i = 2; i < 12, i++) {} i-- for counting down
while loops	iterates while a condition is true. while (num <= 10){}
do/while loops	same as while but If the condition is false to begin with it will go through at least once. It can also cut down on code. do() while();
try/catch	try to make this block of code work, if it doesnt use the catch statement to show an error message
throw	creating an error message within a definition or within main. Any throw will work as long as catch has (…) next to it.

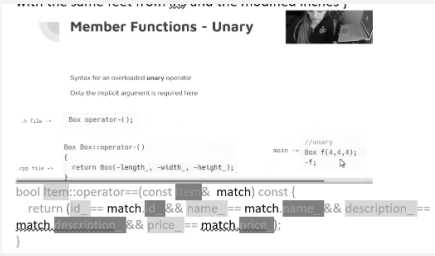
Overloaded Operators: classes

Overloaded Function	same name different parameters, need these to be able to do basic math/comparisons on objects student1 vs int 5
Member Functions - binary	Box operator+(box const &rhs)const adding a box variable to a rhs
Member Functions - binary - definition	Box Box::operator+(Box const &rhs) const {}.
Member functions unary	only the implicit argument is required.
Friend functions	not members of the class. given access to the private member variables. used specifically when you want to be able to use an object on the rhs rather than the lhs. friend Box operator+(Box const &lhs, Box const &rhs);
friend function as insertion operator	friend std::ostream& operator<<(std::ostream& out,Item &item); DEFINITION: ostream& operator<<(ostream &out,Item &item) { out << "-Name: " << item.name_ << " Description: " << item.description_ << " Price: " << item.price_; }

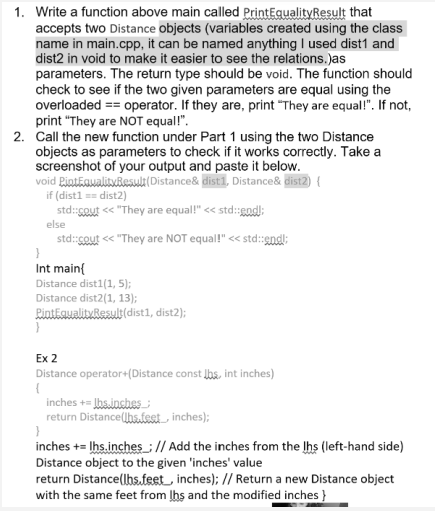
scope

global	can be accessed from anywhere in the program, not placed in a function
local	also known as block scope. between []
function	between {} of a function
namespace	defined in the namespace.

overloaded << operator



writing a function



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std::strings

defining a string	string s1("Man"); or string s2 = "Beast"; or string s3;
combining strings	use the + operator. s3 += "" and "" + s2
Getline	reads up to an enter aka new line getline(cin, name);
cin	reads up to a space cin >> name;
fixes for getline when coming after a cin	add a cin.ignore(); before the getline statement
.size() and .length()	do the same thing, finds the length of the string
Concat-enating with numbers	use to_string. string full = str + to_string(value);
comparing strings	same idea as values A is smaller in askii than B, Lower case values are larger than upper case in the askii table.

std::strings (cont)

.find()	returns the position of the search item.specify a start position of search str.fing("iss"); can also look for the option after the first time pos = str.find("iss"); str.find("iss", pos +1)
string::npos	no position aka not found
substring	returns a portion of the string and specifies the end. int space = str.find(" "); string school = str.substr(0, space);
.at vs [] for iterating over strings	.at is read only where as [] is read and write, .at will terminate if you are looking for something out of range [] will display random junk
cstring vs std::string	c-string pros: fixed length and prmitive data type. cons: watch for out of bounds. std::strings more intuitive to use and checks for out of bounds.

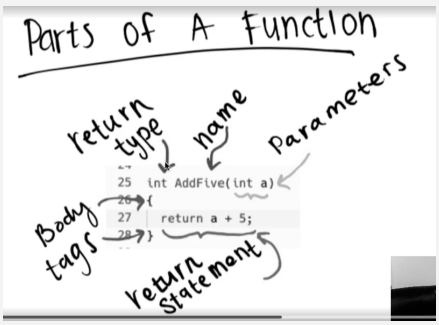
stringstream

#include <sstream>	adds strings, objects and values into a stream, parse streams and strings into values
<<	used to add to the stringstream. .str() function converts the stream to a string. stringstream sout; sout << "add words";
parsing	string str = "one two three four"; stringstream sout; sout << str; string temp; while(sout >> temp) {cout << temp << endl;}

class member functions example

example main, cpp and h files

parts of a function



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