



CSCI 103: Introduction to Programming

Lab 2

January 19, 2024



Welcome to CSCI 103 Lab!

- Staff Introductions
- Lab Structure
 - Graded Labs (can miss up to 2 w/o penalty)
 - For human check-off (this week): Must give an honest attempt and participate in the activities and ensure one of your staff checks you off on Codio (i.e. 100 or 0)
 - For automated checks (programming tasks, etc.) you must receive 50% or higher and then at the end of the semester that will be changed to 100%.
 - Ungraded labs (optional)



Coding Contest

- Today we will be practicing using arrays in C++!
- We will split into teams of 4-5 (preferably 4)
- Each team will work to complete 14 programming tasks
- Points will be awarded for each completed task
- Friendly, points-based competition between teams



Making Teams

- Form teams of 4-5 nearby students
- Make a team **name** and report it to your staff (to write on the whiteboard)
- Within the team, use “pair programming” (unless there is an odd number of people)
 - 2 people (From the same team) program together on the same computer
 - Both people: think and suggest code
 - One person: types the code
 - Other person: reads/reviews each line, finds errors, offers suggestions
- Distribute tasks among your team’s pairs or work on difficult ones all together



Scoring

- **Level 1 (1 pt. each)**
 - sum, min, minmax, find, pat1
- **Level 2 (2 pts. each)**
 - reverse, dup2, allneg, pat2
- **Level 3 (points vary)**
 - unique (3 pts), min2 (3),
kcopy (3), eqdist (3), maxrun (4)



Example Task - Sum

Goal:

Read in an integer n (≤ 100) from the console. Read in n integers, storing the integers in an array. Print the sum of the n integers in the array.

Starter Code - Sum



```
#include <iostream>
// you may not add more libraries
using namespace std;

int main()
{
    // Input code
    int data[100]; // at most 100 elements
    int n;
    cin >> n;      // get the number of elements to be input and used
    for(int i=0; i < n; i++){
        cin >> data[i]; // get each of the n inputs
    }

    // Task Description: find the SUM of the array data (e.g. 6 for [1,2,3]).
    int sum;

    // YOUR code goes here - you may introduce (scalar) variables but no more arrays.

    // Output Code: Prints resulting SUM
    cout << sum << endl;

    return 0;
}
```



Lab File Layout and Testing

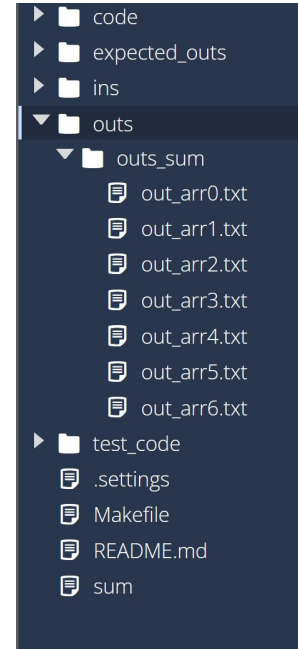
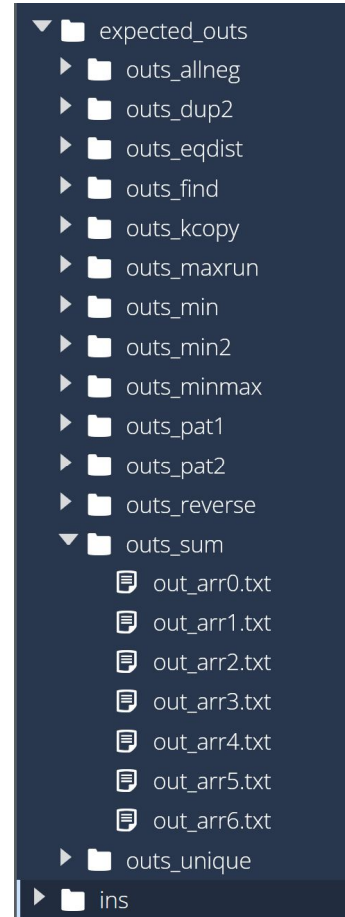
- All .cpp files in code/ directory
- Run automated tests using the "Check It" button for each
- To test the code on your own for debugging purposes use make utility which runs a script to compile your code
 - To compile + run tests type **make <exercise>** (i.e. **make sum**)





Running Tests + Viewing Test Output

- Inputs used for our tests are in subfolders of `ins/`
 - `ins/ins_sum/` has input test files for sum
- Expected outputs for each test are in `expected_outs/`
- Running `make sum` **doesn't print output to screen** but saves outputs for each test in the `outs/` folder (`outs/outs_sum/` has the output your program generated for each test input)
- Compare expected output with your output to find bugs





During Competition

- **Scoring:** TAs will keep score up front for each team (report your team name before you start). As you pass the automated tests raise your hand and show the TA to earn points for your team. TAs will track scores on the whiteboard.
- **Time:** 60 minutes
- **Post- Competition Review:** After the competition the TAs can go over solutions to whichever problems you want to see



Get Started!

- Head to blackboard.usc.edu
- Navigate to CSCI 103 -> Assignments -> Labs -> Lab 2
- Clicking on Lab 2 will open a Codio link
- After reading through the instructions, click “Next” at the bottom of the page to advance to the coding



Post Lab

- Congrats to the winning team!
- Once the competition is over, make sure to check in with a CP before you leave to ensure you have a 100 in your codio if you stayed engaged during the competition
- Have a good weekend!