

CSC 212: Data Structures and Abstractions

University of Rhode Island

Laboratory #3

What to do

You will be working with a partner for this Lab. We will practice analysis using amortization and timing methods while practicing writing code.

Go to the Lab website and download the starter code for Lab 3. There should be 3 files: `dyn-array.h`, `dyn-array.cpp`, `main.cpp`. Create a new project with these three files. Information on dynamic arrays can be found in your text starting on page 39. Your lab instructor can also fill you in. You are given code that implements most of a dynamic array. With your partner, finish coding the `dyn-array` class. Answer the questions on the back of this page. Once you are finished coding, be sure to test your method, and use the debugger. Remember to test edge cases (what happens when the array is empty, what happens when it is full and an `append` is called...) When you are satisfied that your code is working, modify the `main.cpp` file to include at least 5 different values for the rate of increase. This is the variable called `rate` and represents how much the dynamic array is extended when it has reached capacity. Analyze the data you get from your runs, use amortization and fill in the table below.

Dynamic Array Analysis

Now that you understand how Dynamic Arrays work, what do you think the asymptotic character of the running time of a Dynamic Array is?

Complete the table with values from your tests.

Rate of Increase	Initial Size	Number of Inserts	Number of Extends	Run Time

Does the data in your table agree with your initial intuition?

Name:

Name:

Questions

Referring to dyn-array.cpp:

1. Why are there 2 constructors?
2. Why is there a destructor? Do we always write one?

3. What data type does a DynArray hold?

4. Where would I look to know the data members of DynArray?

Referring to main.cpp:

5. Why are there quotation marks around dyn-array.h and not angle brackets?
6. How do we create an object of DynArray type?