AUM Computer Science Department
Graduate Level Programming Capability Assessment Exam Preparation Information

Textbook:

Murach's C++ Programming (2nd Edition)

by Mary Delamater and Joel Murach

- https://www.murach.com/shop/murach-s-c-programming-2nd-edition-detail
- https://www.amazon.com/Murachs-Programming-2nd-Joel-Murach/dp/1943872961/ref=pd_lpo_1?pd_rd_i=1943872961&psc=1

Section 1 Essential skills for modern C++

Chapter 1 An introduction to C++ programming
Chapter 2 How to write your first programs
Chapter 3 How to make decisions
Chapter 4 How to code loops
Chapter 5 How to work with I/O streams and files
Chapter 6 How to work with data types, strings, and vectors
Chapter 7 How to code functions
Chapter 8 How to test, debug, and deploy an application

Section 2 More skills as you need them

Chapter 9 How to work with structures and enumerations
Chapter 10 How to work with built-in arrays and C strings
Chapter 11 How to work with exceptions

Section 3 Object-oriented programming

Chapter 12 How to define classes
Chapter 13 How to work with inheritance
Chapter 14 More skills for object-oriented programming

Section 4 Data structures and algorithms (only the basic selected Chapters)

Chapter 15 How to work with STL containers and iterators
Chapter 17 How to work with memory and pointers

Sample Multiple Choice Question 1:

What does the statement that follows do?
```
int* age = new int(49);
```

a) It defines an integer with the value 49 and stores it in the variable named age.
b) It allocates free store memory for an integer with the value 49 and stores the value in the variable named age.
c) It allocates free store memory for an integer with the value 49 and stores a pointer to that memory in the variable named age.
d) It allocates 49 bytes of free store memory and stores a pointer to that memory in the variable named age.

Sample Multiple Choice Question 2:

What are the values of the elements in the vector named names_1 after the following code is executed?
```
vector<string> names_1 { "Mike", "Ben", "Joel", "Anne" };
vector<string> names_2 { "Judy", "Samantha", "Kelly" };

names_1.insert(names_1.end(), "Mary");
names_1.erase(names_1.begin());
names_1.insert(names_1.begin() + 2, ++names_2.begin(),
names_2.end());
names_1.swap(names_2);
names_1.erase(++names_1.begin());
names_1.insert(names_1.begin(), ++names_2.begin(),
names_2.begin() + 2);
```

a) Joel, Judy, Kelly
b) Judy, Mary, Joel, Mary
c) Joel, Judy, Samantha
d) Joel, Anne, Judy, Samantha

Sample Free Response Question:

Define a class called "Square". Square class will have one "double" attribute called "side". Write setter and getter functions, a constructor function, and functions that calculate the area and the perimeter of the square.

Students design: