

Review for Final

Final Exam Schedule

- 8:00 A.M. class
 - Date 5/15/2026 (08:00 A.M.~ 10:30 A.M.)
- 9:30 A.M. class
 - Date 5/18/2026 (08:00 A.M.~ 10:30 A.M.)
- Comprehensive test
- Similar format with two midterm exams and mini-tests

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Review for Final

- Pointer variables
- Relation between a Pointer and a Name of Array
- Pointer and Array
 - Pointer and Integer Array
 - Pointer and Character Array
- Array of Pointer to Character String

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□ Structured Data Types

- How to define a structured Data Type
- Memory Allocation of Structured Data Type
 - Memory allocation by declaration
 - Dynamic Memory Allocation by new
- Accessing a Members in a Structured Data Type
- A structured Data type as a member of other Structured Data Type
- Passing a Structured Data Type as a Parameter
- Initializing members in a Structured Data Type
- Array of an Structured Data Type

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□ Linked List (single linked list)

- Insert
 - Sorted List
 - Insert as a Last element always
- Delete
- Search

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Review for Final

- Object Oriented Program with C++
- Class Declarations in C++
- Class Member Types
 - Private, Public, Protected
- Inline Function vs. Regular Function
- Constructor & Destructor
- Assessing a Class Member
- Initializing class Objects with constructor
 - With default argument
 - Without Default argument

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- Separating Interface from Implementation
 - makefile
- Scope of Member
- Utility Functions
- When Constructor and Destructor is called?
- Insecure Public Function

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- Algorithm & Analyzing Algorithm
- Asymptotic Notation
 - Big Θ Notation
 - Big O Notation
 - Big Ω Notation

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- Constant Object and Constant Functions
- Composition: Object as Member of Classes
- Friend functions
- The Use of Friend Functions
- Friend Classes

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- What is Template?
- Function Template.
- Function Template Specialization
- Class Template

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- What is a Stack
- Functions for managing a Stack
 - Push
 - Pop
 - IsEmpty
 - IsFull
 - Top
- A Stack Implementation with Linked List

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- What is a Queue
- Functions for managing a Queue
 - EnQueue
 - DeQueue
 - EmptyQ
 - FullQ
 - FrontQ
- A Queue Implementation with a Linked List

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- Static Member in a class
 - Static variables
 - Static Functions
- Recursion
 - Memory allocation
 - Solving problem with Recursion
 - Recursion Examples
 - Factorial
 - Quick Sort
 - Fibonacci number
 - Palindrome
 - C-string functions: compare, count, ...
 - Sum of Range
 - Greatest Common Divisor
 - Binary Search

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- Operator Overloading
 - As a member function
 - As a Friend function
- Copy Constructor
 - Default copy constructor
 - How to define a copy constructor
- Graph
- Tree
- Binary Tree
- Binary Search Tree

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- Binary Search Tree
 - Binary Search Tree Property
 - Binary Search Tree Operations
 - Inorder walk
 - Preorder walk
 - Postorder walk
 - Search Tree
 - Insert a element to the Tree
 - Delete a element form the Tree

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- Inheritance
 - Type of Inheritance
 - Syntax for Derived Class
 - Overriding Member Function in the Base Class
 - Using Member Functions
 - Casting Base-Class Pointers to Derived-class pointer
 - Using constructor and destructors in derived classes
 - Virtual function

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- Virtual Function and Polymorphism
- Heap & Priority Queue & HeapSort
 - Heap Properties
 - Heap functions
 - Heapify
 - Leftchild, RightChild, Parent
 - Build Heap
 - Insert
 - Heap Sort
 - Extract Max

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- Sorting
 - Bubble Sort,
 - Insertion Sort,
 - Selection Sort,
 - Shell Sort
 - Quick Sort
 - Heap Sort

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