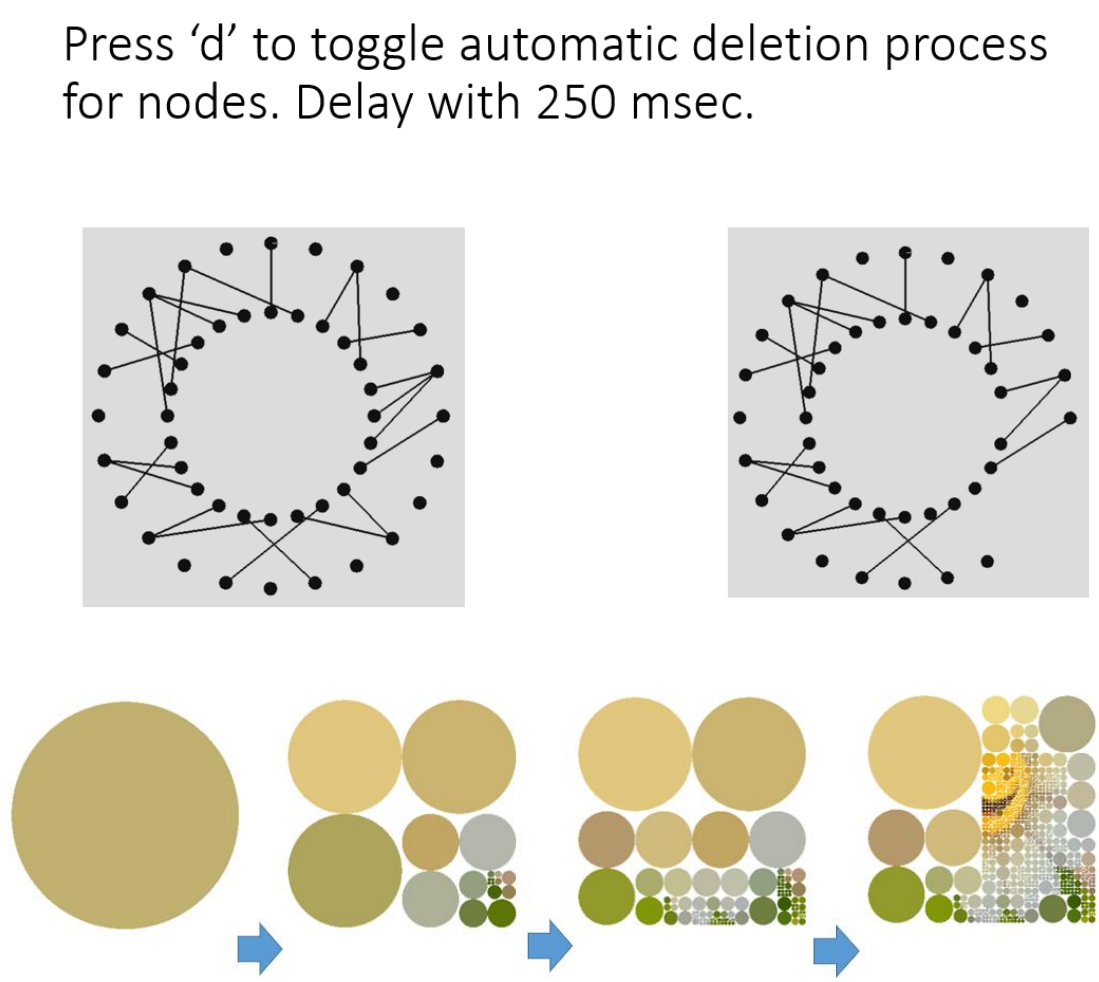
Midterm Project

1. *A user can move the mouse to explore an image in a hierarchical manner. When the mouse cursor hits an unexplored region, the region is split into four smaller regions.*
2. *Design a data structure to manipulate a graph. You should use the given data structure GRAPH_NODE and GRAPH_EDGE. The position of a node is on the x-z plane. Keep the y-coordinate of a node as zero.*

- TASK1: Complete `IMAGE_SYSTEM and IMAGE_NODE` in 00_StudentWork's mySystem_ImageEditor.cpp
  TASK2: Complete `GRAPH_SYSTEM` in 00_StudentWork's mySystem_GraphSystem.cpp
- RESULT:



Object Oriented Programming Project

Perform Monte Carlo Simulation and Quatic Function Calculation

- TASK: Write programs in .NET2010. Complete functions in 00_SimpleInteractiveSystem.

Labs in course

Lab 1: Function Operations & Root Finding

- **Content:** Perform operations on two functions or compute the root of a function.
- **Technique:** Class switch.

Lab 2: Greatest Common Divisor (GCD) Calculation

- **Content:** Compute the greatest common divisor of two numbers.
- **Technique:** for loop.

Lab 3: Identifying Used Letters in a String

- **Content:** Determine which letters are used in a given text.
- **Technique:** Array.

Lab 4: Determinant of a 3×3 Matrix

- **Content:** Compute the determinant of a 3×3 matrix.
- **Technique:** Adjoint matrix (A adj(A) = det(A)I).

Lab 5: Vector Operations

- **Content:** Perform operations on vectors.
- **Technique:** Operator overloading.

Lab 6: Categorizing Students by School

- **Content:** Group students based on their school and verify the students in each school.
- **Technique:** Inheritance, dynamic casting (upcasting and downcasting).

Lab 7: Constructing a Map Using Vectors

- **Content:** Build a map using vectors.
- **Technique:** Algorithm (sort), iterator.

Lab 8: Finding the Optimal Path in a Maze

- **Content:** Solve a maze to find the best route.
- **Technique:** Breadth-First Search (BFS).

Lab 9: Linked List Operations

- **Content:** Implement and perform operations on a linked list.
- **Technique:** Linked list.

Lab 10: Max Heap Sort Using a Dynamic Array

- **Content:** Implement Max Heap Sort using a dynamic array.
- **Technique:** Max Heap Sort.