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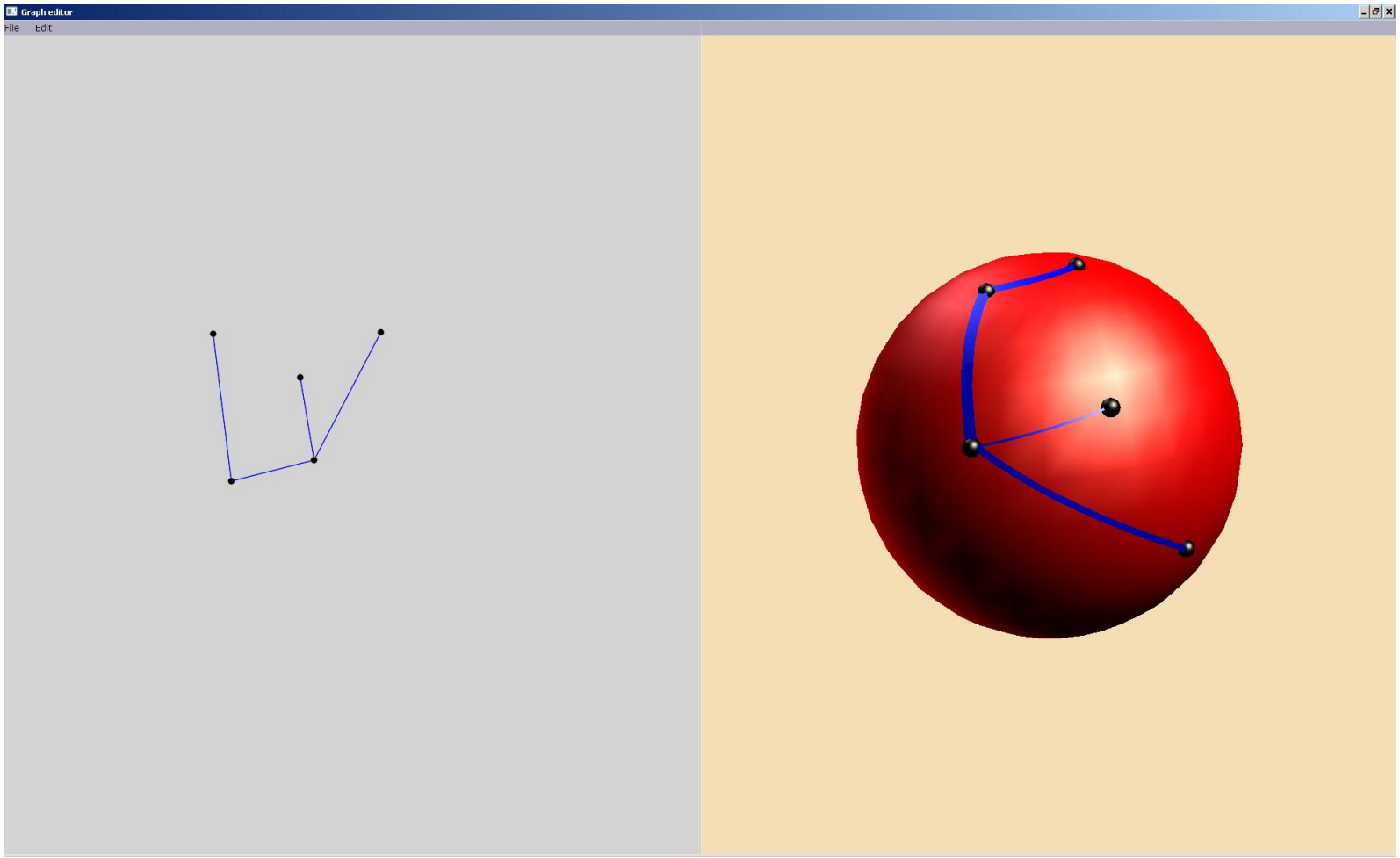
Graph editor

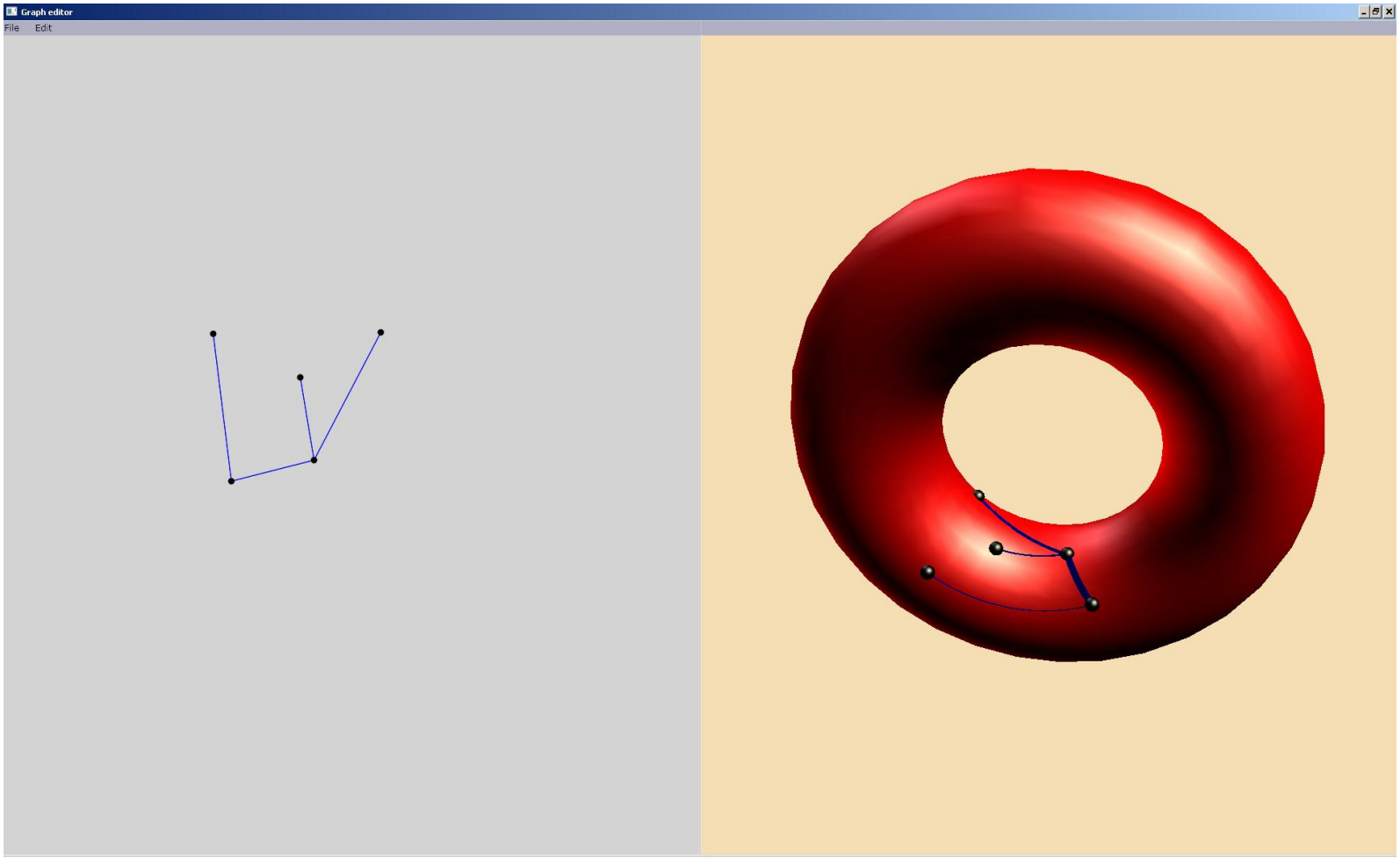
Graph editor functionality

- Program lets you create, edit and store graphs with definition of drawing
- There is 2D and 3D visualisation
- In 2D mode you can
  - Move, add, remove vertices and edges
- Sphere and torus surfaces are avalible

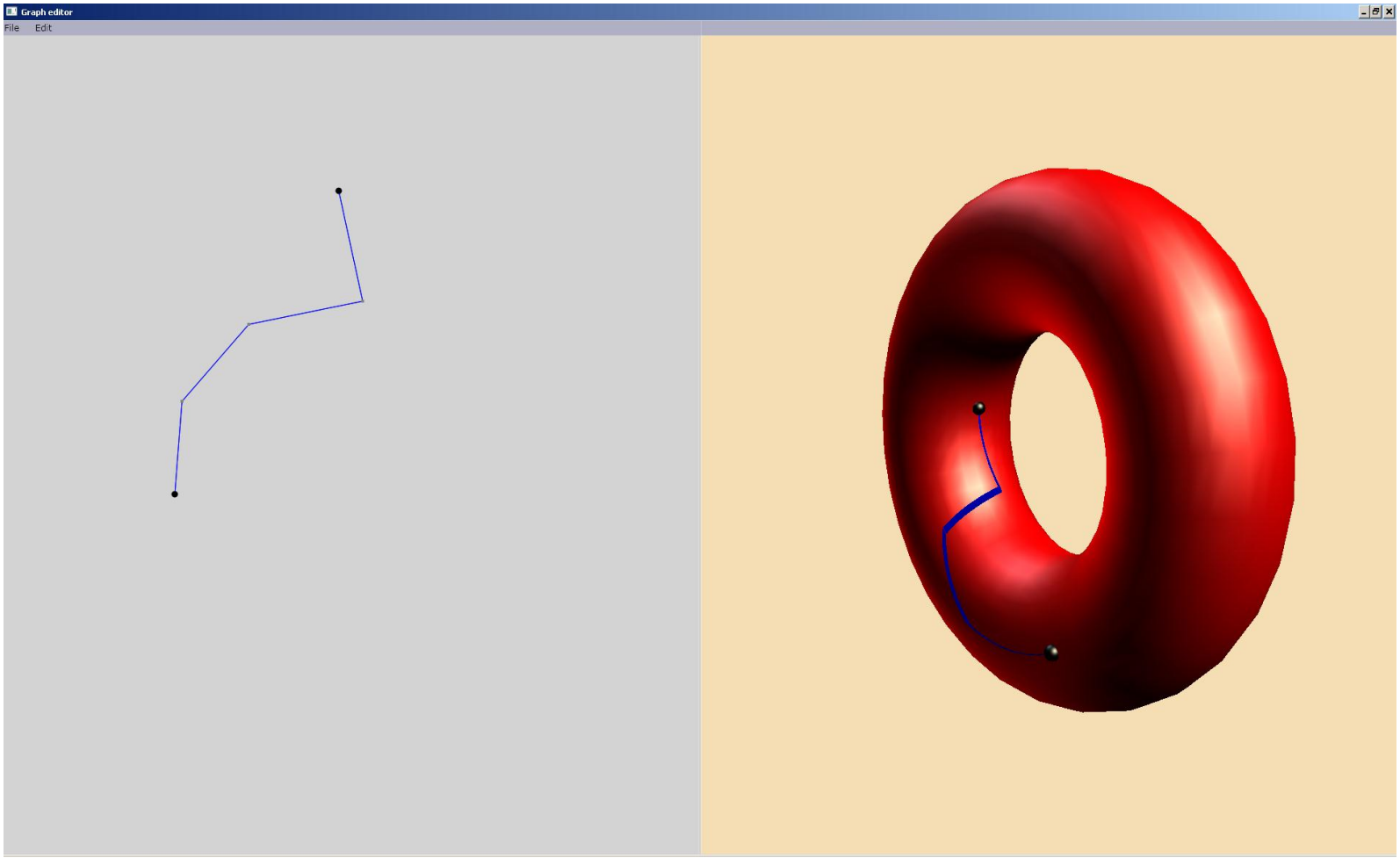
Graph on sphere



Graph on torus



Polygonal line



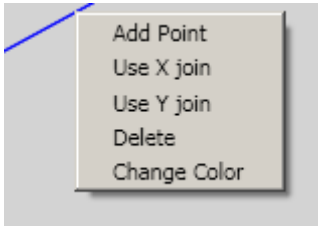
Graph editor control

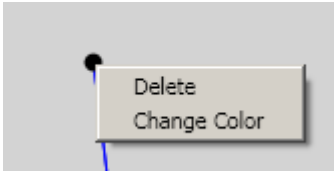
- Move vertex
  - Can be done with left mouse button “drag and drop”
- Add vertex
  - Just click with middle button on position, where new point is needed
- Add edge
  - Middle button click on begin vertex, drag to the end point and release

Graph editor control

- Context menus
  - Vertices and edges also have context menu which allows you
    - Change color
    - Delete selected object
    - Set some other attributes
  - Context menu can be accessed by right mouse button click

Context menu





Solution description

- Solution is divided into four projects
  - Graph definition
  - Graph editor
  - Plugin interface
  - Test plugin

Graph Editor

- Contains main window which have to parts
  - In left part
    - There is a 2D drawing of Graph defined by graph definition
    - It is drawn by WPF
  - In right part
    - There is a 3D made using XNA

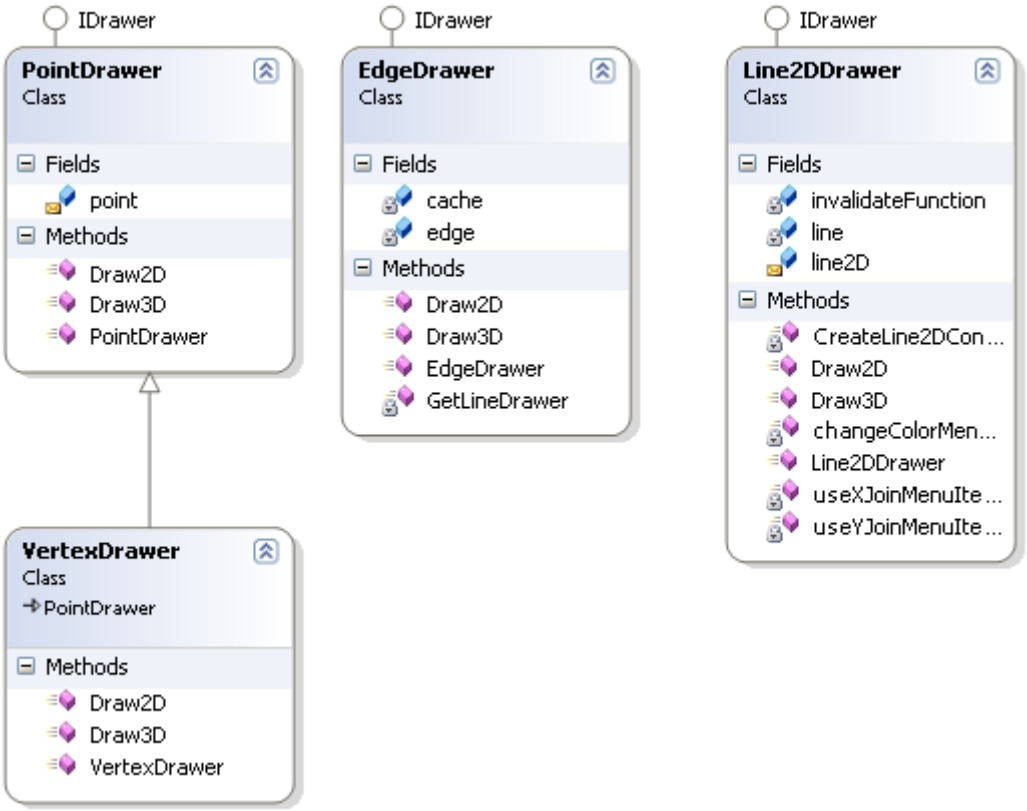
Graph editor – graph object

- Stores graph definition (described later)
- Caches drawers
- Caches 3d surface model
- Two main methods
  - Draw 2D
    - Drawing 2D model using WPF
  - Draw 3D
    - Drawing 3D model using XNA

Graph editor - Drawers

- All drawers implement IDrawer interface
  - Two methods
    - Draw 3D
    - Draw 2D
- Separated drawer for each part of graph
  - Edge, line, vertex, point
- Caches 3D primitives

Graph editor – Drawers diagram



Graph editor – undo redo serializer

- Stores an array of MemoryStreams which are used to store states of graph
- Methods
  - Action()
    - Called by each action which can be undo
  - Undo/redo
    - Returns older/newer state of graph definition from memory

Graph editor – 3d Primitives

- All primitives inherit from GeometricPrimitive class
- Defined primitives
  - Torus
  - Sphere
  - line3D
    - Line on torus/sphere

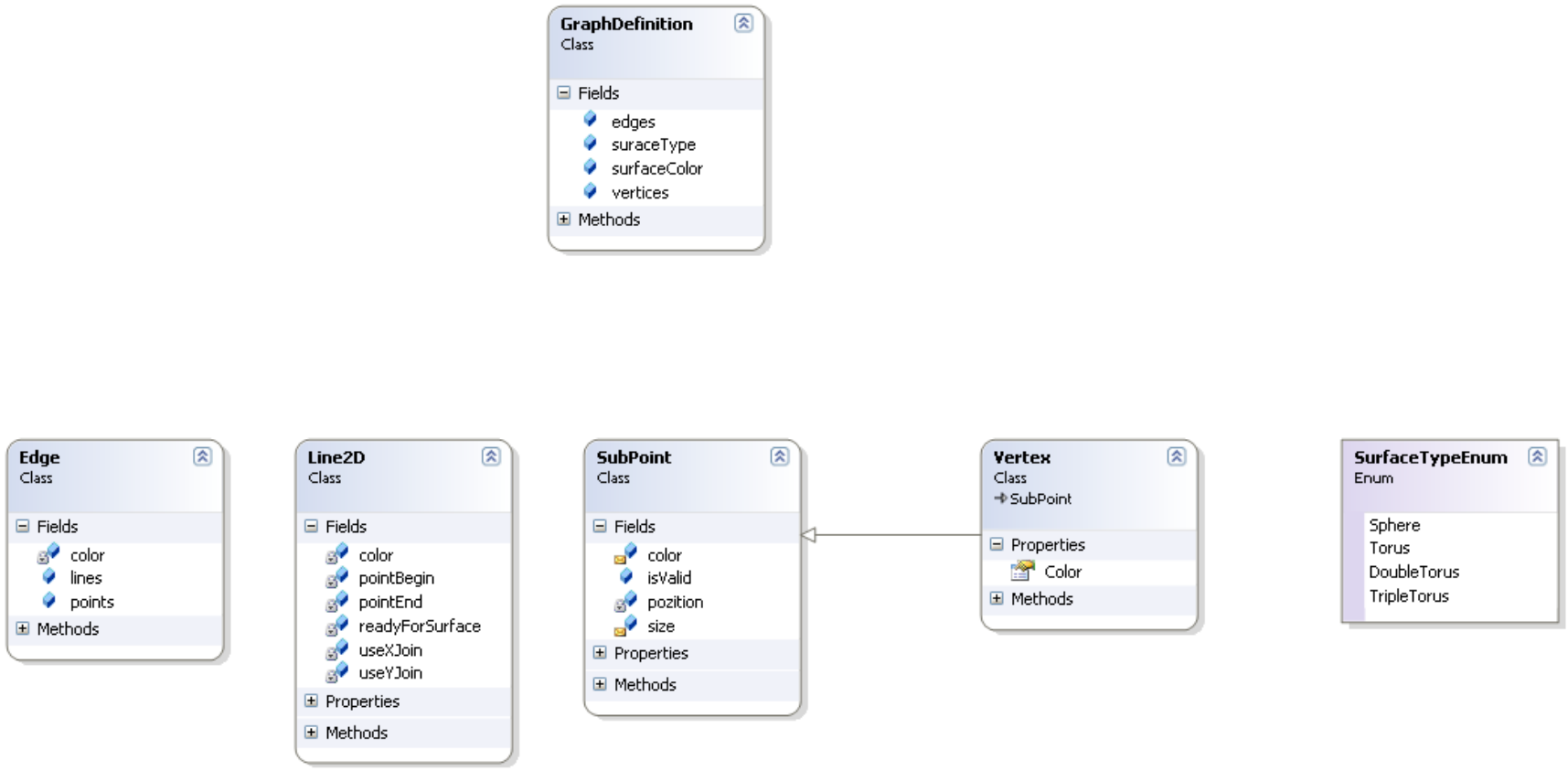
Graph definition

- Describes the graph with positioning and colors
- Entire definition is serializable and it is used to store Graph in file
- But there is no definition how is the graph drawn

Graph definition

- Main class is GraphDefinition
  - Contains
    - List of vertices
      - Each vertex stores position and color
        - Position is stored relatively in range [0 – 1]
    - List of edges
      - Each is composited of lines to create polygonal line
      - Line have begin and end point, two Booleans for using joints
    - Surface type
      - Sphere or torus (other not supported yet)

Graph definition – class diagram



Plugin + plugin interface

- Plugin interface specifies only one method called Positioning
  - Parameter of this method is Graph definition
  - Return type is also Graph definition
- Test plugin just sets all Vertex positions on random