Graph Implementation

Class Diagram

```
V, E
                        Graph
+ Graph()
+ clear()
                                                                   «interface»
                                                                   Iterable
+ clearEdges()
+ vertexCount(): int
+ edgeCount(): int
                                                                DuplicateVertexException
+ addVertex(v: Vertex<V>)
+ addVertices(vertices: ArrayList<Vertex<V>>)
+ containsVertex(v: Vertex<V>): boolean
                                                                 DuplicateEdgeException
+ addEdge(e: Edge<V, E>)
                                                                  NoSuchVertexException
+ addEdges(edges: ArrayList<Edge<V, E>>)
+ containsEdge(e: Edge<V, E>): boolean
                                                                   NoSuchEdgeException
+ removeVertex(v: Vertex<V>): ArrayList<Edge<V, E>>
+ removeEdge(e: Edge<V, E>)
                                                                           «interface»
+ adjacentCount(v: Vertex<V>): int
                                                                          Comparable
+ vertices(): ArrayList<Vertex<V>>
+ adjacent(v: Vertex<V>): ArrayList<Vertex<V>>
+ edges(): ArrayList<Edge<V, E>>
+ iterator(): Iterator<Vertex<V>>
                                                                             Vertex
+ minSpanningTree(v: Vertex<V>): Tree<V, E>
                                                              + Vertex(label: V)
+ totalVertexWeight(): int
                                                              + Vertex(label: V, weight: int)
+ totalEdgeWeight(): int
                                                              + getLabel(): V
+ hasCycle(): boolean
                                                              + getWeight(): int
                                                              + setLabel(label: V)
                                                              + setWeight(weight: int)
                                                              + compareTo(other: Vertex<V>): int
                                                              + toString(): String
                                        V, E
                  Tree
+ BinaryTree()
                                                                                              √V, E
+ getParent(): Tree<V, E>
                                                                     Edge
+ getVertex(): Vertex<V>
                                                Edge(v1: Vertex<V>, v2: Vertex<V>, label: E)
+ isChild(): boolean
                                                Edge(v1: Vertex<V>, v2: Vertex<V>, lable: E,
+ isParent(): boolean
                                                weight: int)
+ isRoot(): boolean
                                                getVertex1(): Vertex<V>
+ isLeaf(): boolean
                                                getVertex2(): Vertex<V>
+ isDegenerate(): boolean
                                                getLabel(): E
+ height(): int
                                                getWeight(): int
+ depth(): int
                                                setVertex1(v: Vertex<V>)
+ isSuperTreeOf(t: Tree<V, E>) boolean
                                                setVertex2(v: Vertex<V>)
+ isSubtreeOf(t: Tree<V, E>) boolean
                                                setLabel(label: E)
+ isSiblingOf(): boolean
                                                setWeight(weight: int)
+ isChildOf(): boolean
                                                equals(other: Edge<V, E>): boolean
+ isParentOf(): boolean
                                                toString(): String
+ makeNewRoot(t: Tree<V, E>)
```