Graph

CTR

Create empty arrayList<LinkedList>

Int getNumOfVertex()

Return \_vertextArr.size();

Void printVertexes()

Loop arrayList.size() times

Get element from arrayList

Call print linkedList

addVertex(Character vertex)

Check vertex exist in the arrayList // Call contains(Character Vertex)

If it already exists

Return null

Make a new linkedlest object with vertex as a \_headVertex

Store the object to the arrayList

int findVertexHeadIndex (Character vertex)

Loop

Access arrayList object

Get getheadVertex

Check Head vertex == vertex //Call isTargetVertexList

If yes return arrayList current index

If no back to loop

Void addEdges(Chracter frmVertex, Character toVertex)

Check frmVertex exist in the arrayList // Call contains(frmVertex)

Check toVertex exist in the arrayList // Call contains(toVertex)

Loop

Get target vertex arrayList index

// Call isTargetVertexIndex(Character vertex)

Call add method from LinkedList object

Boolean isTargetVertexList(Chracter frmVertex, LinkedList vertex)

Check frmVertex == vertex.getHeadVertex

Void clear()

Initialize ArrayList

Boolean contains(Character vertex)

Loop

Iterate arrayList

Check arrayList object’s headVertex == argument vertex

If yes, return ture

No back to loop

T[] toArray (Character vertex)

Call findVertexIndex(vertex)

Call arrayList(index).toArray()

Return array object.