**ClusterLIB Project Documentation**

1. **Class : ClusterUtility**

**Members :**

* Cardinality (Enumeration) [Constant Variables]

Define Relationship Type (one=0, many=1)

* Relationship (Enumeration) [Constant Variables]

Define Kind of Relationship Exist (INHERITANCE=0, AGGREGATION=1, COMPOSITION=2)

* NotExisting (Static Integer) [Value=0]

Used as Default Value for relationship when there isn’t any relationshop

1. **Class : ClusterRelationship**

**Members :**

* relationship (Enum Object)

used to store the relationship type (refer class : **ClusterUtility)**

* cardinality (Enum Object)

used to store the cadinality type (refer class : **ClusterUtility)**

* ID ( Integer )

Give Unique id to each relationship, Unique identifier ( like primary key )

1. **Class : ClusterField**

**Members :**

* FieldName (String)

Used to store name of field ( like DeptID, DeptName etc )

* FieldValue (Object)

used to store value part of field ( like 1, “IT Department” etc )

**Constructor :**

* ClusterField(FieldInfo field, Object OnObject)

Used to initialize the members of clusterField named FieldName,FieldValue

1. **Class : ClusterObject**

**Members :**

* ObjectID (Int)

Unique Identifier, used to identify object uniquely.

* Attributes (List of ClusterField Object)

Contains ClusterField Objects, all public members of class are stored as ClusterField Object into Attributes List.(like DeptID=1, DeptName=”IT”)

* relatedObjects (List of ClusterRelationShip Object)

Contains ClusterRelationship Objects, all relation of object with others objects are stored as reference here.

**Constructor :**

* ClusterObject(int objID)

Used to Initialize object with Unique ID

**Methods :**

* GetValueByField (String fieldName)

Used to Retrieve value of Attribute/Member by passing its name like passing DeptID it will return 1 (as DeptID)

1. **Class : ClusterClass**

**Members :**

* ClassID (Int)

Unique Identifier, used to identify Class uniquely.

* ClassName (String)

Name of Class like Department, Employee etc

* objects (List of ClusterObject Object)

Contains all ClusterObject Objects of same class, for e.g. all department objects are stored into ClusterClass Object (ClassID=1, ClassName =“Department”)

* relationships (List of ClusterRelationShip Object)

Contains ClusterRelationship Objects, all relation of this class objects with others objects as well as relation with object of same class, are stored as reference here.

**Constructor :**

* ClusterClass(int cID)

Used to Initialize Class with Unique ID

**Methods :**

* GenerateNewObjectID ()

Used to Obtain new Auto Generated ObjectID for that class

1. **Class : ClusterDatabase**

**Members :**

* lastClassID (Int) [Default 0]

store/track the ID of class which is created recently/at the last.

* lastObjectID (Int) [Default 0]

store/track the ID of object which is created recently/at the last.

* Classes (List of ClusterClass Object)

Contains all ClusterClass Objects of same Database, like all SQL tables into one SQL Database

**Methods :**

* GenerateNewClassID ()

Used to Obtain new Class ID

* GenerateNewObjectID ()

Used to Obtain new Object ID, regarding Database

* findClassByID(int classID)

Used to Find/Obtain ClusterClass object by passing classID

* findClassByName(String className)

Used to Find/Obtain ClusterClass object by passing className

* findObjectByID(int objID)

Used to Find/Obtain ClusterObject object by passing objID

1. **Class : ClusterFileIO**

Used for performing CRUD(Create, Read, Update, Delete) operation with Database.

**Members :**

* filePath (String)

store name of database filename

* ClusterDatabase (Object)

Contain the reference of database object, used to connect to database

**Methods :**

* GetStoredClasses ()

Used to Get All ClusterClasses of Initialized Database

* StoreObject(Object objToStore) (Used Externally)

Used to save Object into Database

* StoreObject(ClusterObject clsObj, Object objToStore) (Used Internally)

Used to save related Object into Particular clsObj In Database

* UpdateObject(int objID, Object objToStore)

Used to update the object by specifying ObjectID, new Updated Object

* RemoveObject(int objID)

Used to remove object from database by passing object id

* StoreInClass(Type t, ClusterObject clsObj)

Used to store object into class(like inserting record into table) into database ( used internally by StoreObject Method)

If Class not Exist ( sql table is not exist), then it first create class class reference then storing it.

* CreateOrCheckClass(Type t)

Used to Retrieve Class ID, If Class is not exist then create new one and set its ID & Return it

* WriteToDisk ()

Used to write all data into database ( like sql commit statement)

* ReadFromDisk ()

Used to load all data from serialized file into ClusterDatabase object,

Persist all data into database object.

* GetObjectByID(int ID)

Used to find object from database by passing Object ID

* GetClassByID(int ID)

Used to find class from database by passing Class ID

* GetClassByName(String Name)

Used to find class from database by passing Class Name

**Constructor :**

* ClusterFileIO(String filePath)

Used to Initialize Database by passing filepath of serialized database file.