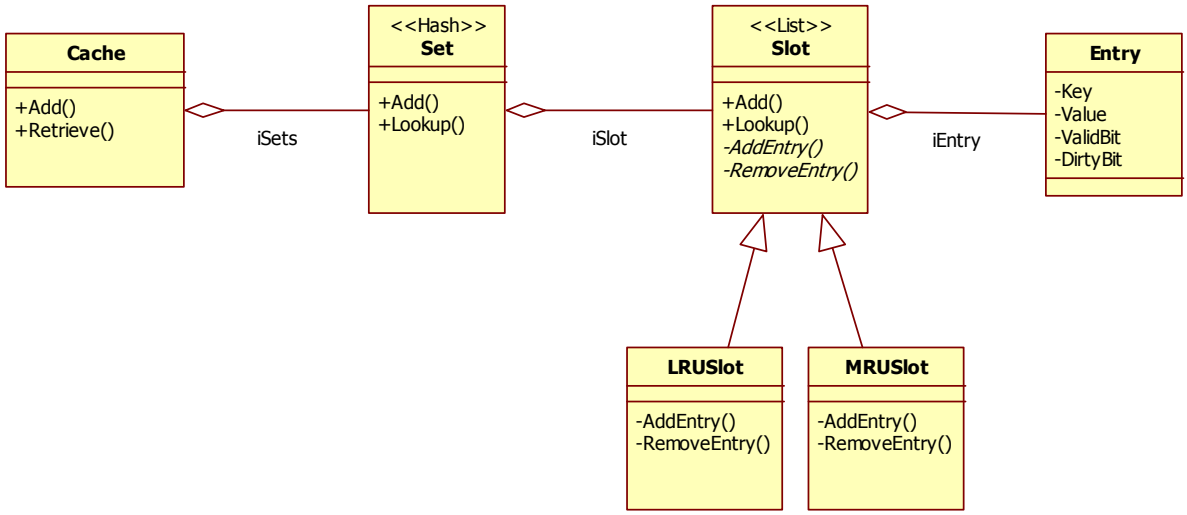
Class Design for N-way set associative Cache



Design Considerations:

- Simplistic design, but extendable/scalable
- Performance optimization is not one of the main consideration to make the design simple and as realistic as possible for the time limitation

Implementation details:

- Software is distributed to the users/clients as a (dynamic) library ***SetAssociativeCache.dll*** and as two header files ***SetAssociativeCache.h*** and ***Cache.h***
- ***SetAssociativeCache.h*** is defined as a thin template. So all the implementation details including internal data structures are totally hidden from the clients
- ***Cache.h*** has the class declaration for the above mentioned template based header to include
- Simple Array based Hash mechanism is used for maintaining and for easy look up for the Sets
- Simple Linked list (STL *list*) is used for maintaining and look up of the slots
- I avoided using boost library, that would give me heterogeneous containers
- For error handling exceptions can be used, which I have avoided because of the time constraints

API specification:

SetAssociativeCache.h is documented to cover up how to use the APIs.

It exports 4 APIs:

This function should be the first one to use to set up the Cache that takes arguments like:

- Capacity of the Cache (though no check is done, preferably this is power of 2)
- Number that represents N-way Set (though no check is done, preferably this is power of 2)
- Replacement policy (LRU or MRU)

This function should be the first one to use to set up the Cache that takes arguments like:

```
void DestroyCache()
```

This function should be called in the end to free-up the Cache

```
template <class Key, class Value> void AddToCache(const Key& aKey, const
Value& aValue)
```

Template based function that Adds key-value pair to the Cache

```
template <class Key, class Value> void RetrieveFromCache(const Key& aKey,
Value& aValue)
```

Template based function that retrieves the value based on the key