# HASHINH AND HASHMAP IMPLEMENTATION

# import java.util.\*; import java.util.\*; class HashMap<K,V> { class Entity{ K key; V val; Entity(K key, V val){ this.key=key; this.val=val; } } int n;//number if entities int N;//size of buckets LinkedList<Entity> Buckets[]; float lf=2.0f; public HashMap(){ this.N=4; this.Buckets=new LinkedList[4]; for(int i=0;i<N;i++){ this.Buckets[i]=new LinkedList<>(); } } public int HashFunc(K key){ int BI=Math.*abs*(key.hashCode()%N); return BI; } public int searchlist(int BI,K key){ LinkedList<Entity> list=Buckets[BI]; for(int i=0;i<list.size();i++){ if(key==list.get(i).key){ return i; } } return -1; } public void put(K key, V val){ int BI=HashFunc(key); int listindex=searchlist(BI,key); if(listindex==-1){ Buckets[BI].add(new Entity(key,val)); n++; } else{ Entity e=Buckets[BI].get(listindex); e.val=val; } float a=(float)n/(float)N; if(a>lf){ reHash(); } } public V get(K key){ int BI=HashFunc(key); LinkedList<Entity> list=Buckets[BI]; for(Entity e:list){ if(e.key.equals(key)){ return e.val; } } return null; } public void remove(K key){ int BI=HashFunc(key); int listindex=searchlist(BI,key); if(listindex==-1){ System.*out*.println("not present"); } else{ System.*out*.println("removing "+Buckets[BI].remove(listindex).key); n--; } } public boolean containKey(K key){ int BI=HashFunc(key); int ListIndex=searchlist(BI,key); if(ListIndex==-1){ return false; } else{ return true; } } public ArrayList<K> keySet(){ ArrayList<K> alist=new ArrayList<>(); for(int i=0;i<Buckets.length;i++){ LinkedList<Entity> ll=Buckets[i]; for(Entity e:ll){ alist.add(e.key); } } return alist; } private void reHash() { LinkedList<Entity> old[]=Buckets; Buckets=new LinkedList[N\*2]; for(int i=0;i<N\*2;i++){ Buckets[i]=new LinkedList<>(); } for(int i=0;i<old.length;i++){ LinkedList<Entity> ll=old[i]; for(Entity e:ll){ put(e.key,e.val); } } } } public class Main { public static void main(String[] args) { HashMap<String,Integer> map=new HashMap<>(); map.put("india",120); map.put("china",200); map.put("nepal",15); map.put("Srilnak",22); // map.remove("nepal"); // System.out.println(map.get("nepal")); // System.out.print(map.keySet()); ArrayList<String> list=map.keySet(); for(int i=0;i<list.size();i++){ System.*out*.println(list.get(i)+" "+map.get(list.get(i))); } } }