

```
class Item // items for a linked list
{
    int value;
    Item next;

    // constructors
    Item (int x) // construct item with value x
    {
        value = x;
    }

    Item (int x, Item p) // construct item with value x and next p
    {
        value = x;
        next = p;
    }

    void print() // print the information about the item, must exist
    {
        System.out.print(this);
        System.out.print(": value: " + value);
        System.out.print(" next: " + next);
        System.out.println();
    }
}
```

```

class List // List class, singly linked list, test with java List
{
    Item start = null; // start of the list

    Item find(int x)
        // find value x in the list, return item containing it
        // if not present, return null
    {
        Item p = start;
        while (p != null && p.value != x)
            p = p.next;
        return p;
    }

    void insert(Item after, int x)
        // insert a new element after the item after
        // if after==null, insert at front of list
    {
        if (after == null)
            start = new Item(x, start);
        else
            after.next = new Item(x, after.next);
    }
}

```

```
void dele (Item after)
    // del a new element after the item after
    // if after==null, delete first element of list
    // list item must exist, and list must not be empty
{
    if (after == null)
        start = start.next;
    else
        after.next = after.next.next;
}
```

```
void finddel (int x)
    // find an element in the list and delete it
    // do nothing if not found
{
    Item previous = null;
    for (Item p = start; p != null; p = p.next)
        if (p.value == x)
        {
            dele (previous);
            break;
        }
        else
            previous = p;
}
```

```
void print()
    // print the list
{
    for (Item p = start; p != null; p = p.next)
        p.print();
    System.out.println("-----");
}
```

```
public static void main (String[] args)
{
```

```
    List L = new List();
    L.insert(null, 4);
    L.insert(null, 5);
    L.insert(null, 7);
    L.insert(null, 9);
    L.print();
```

```
    Item p = L.find(7); p.print();
    System.out.println("-----");
```

```
    L.delete(p);          L.print();
    L.insert(p, 15);      L.print();
    L.finddel(7);         L.print();
    L.finddel(7);         L.print();
```

```
}
```

```
}
```

/* output generated:

Item@824dbac: value: 9 next: Item@824de64
Item@824de64: value: 7 next: Item@8249624
Item@8249624: value: 5 next: Item@8184da4
Item@8184da4: value: 4 next: null

Item@824de64: value: 7 next: Item@8249624

Item@824dbac: value: 9 next: Item@824de64
Item@824de64: value: 7 next: Item@8184da4
Item@8184da4: value: 4 next: null

Item@824dbac: value: 9 next: Item@824de64
Item@824de64: value: 7 next: Item@829b69c
Item@829b69c: value: 15 next: Item@8184da4
Item@8184da4: value: 4 next: null

Item@824dbac: value: 9 next: Item@829b69c
Item@829b69c: value: 15 next: Item@8184da4
Item@8184da4: value: 4 next: null

Item@824dbac: value: 9 next: Item@829b69c
Item@829b69c: value: 15 next: Item@8184da4
Item@8184da4: value: 4 next: null

***/**

