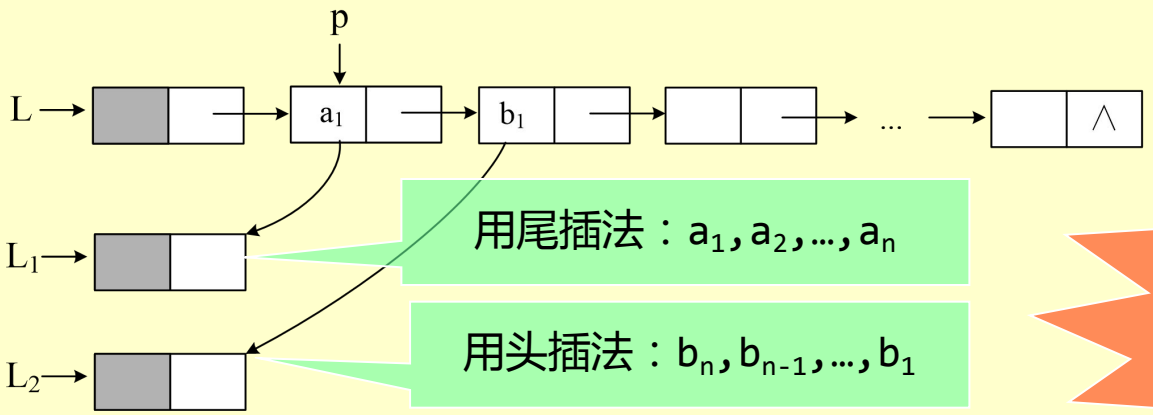
本节主题：

单链表应用举例

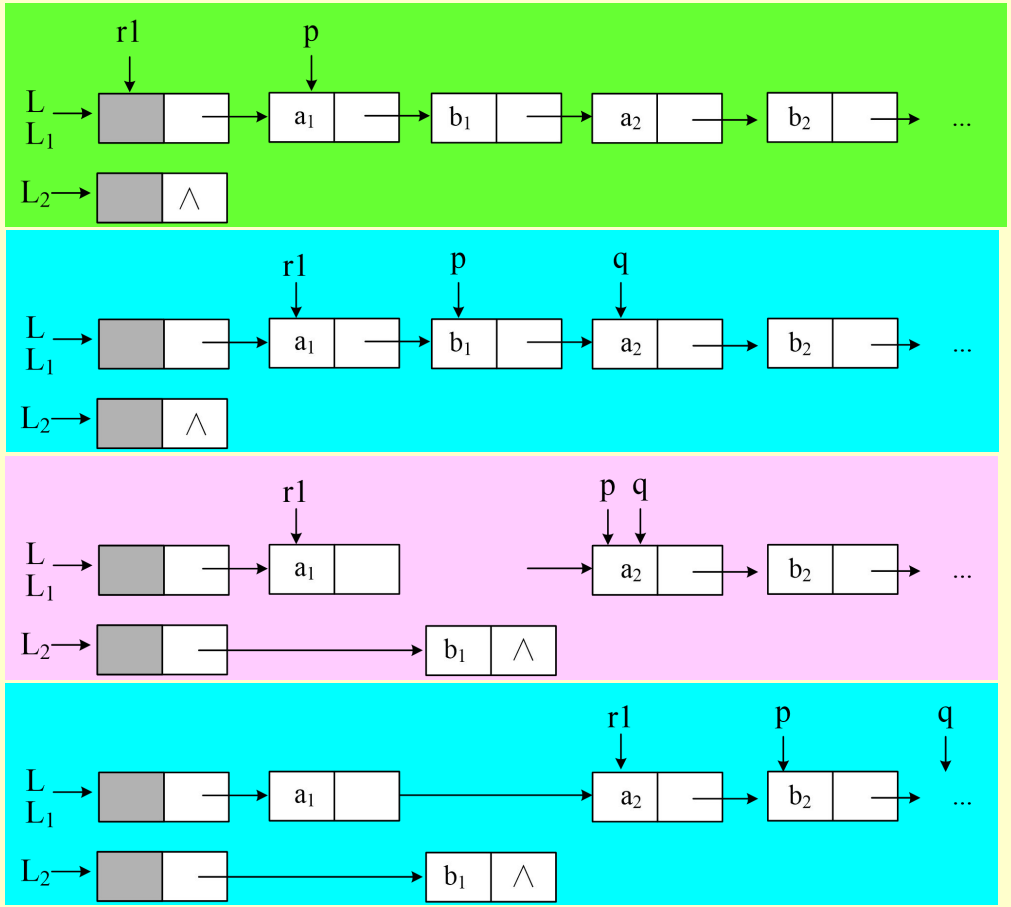
例：拆分单链表

- 问题
  - 有一个带头节点的单链表L={$a_1,b_1,a_2,b_2,\ldots,a_n,b_n$}
  - 设计一个算法将其拆分成两个带头节点的单链表L_1和L_2：
  - L1={$a_1,a_2,\ldots,a_n$}，L2={$b_n,b_{n-1},\ldots,b_1$}
  - 要求L1使用L的头节点
- 分析



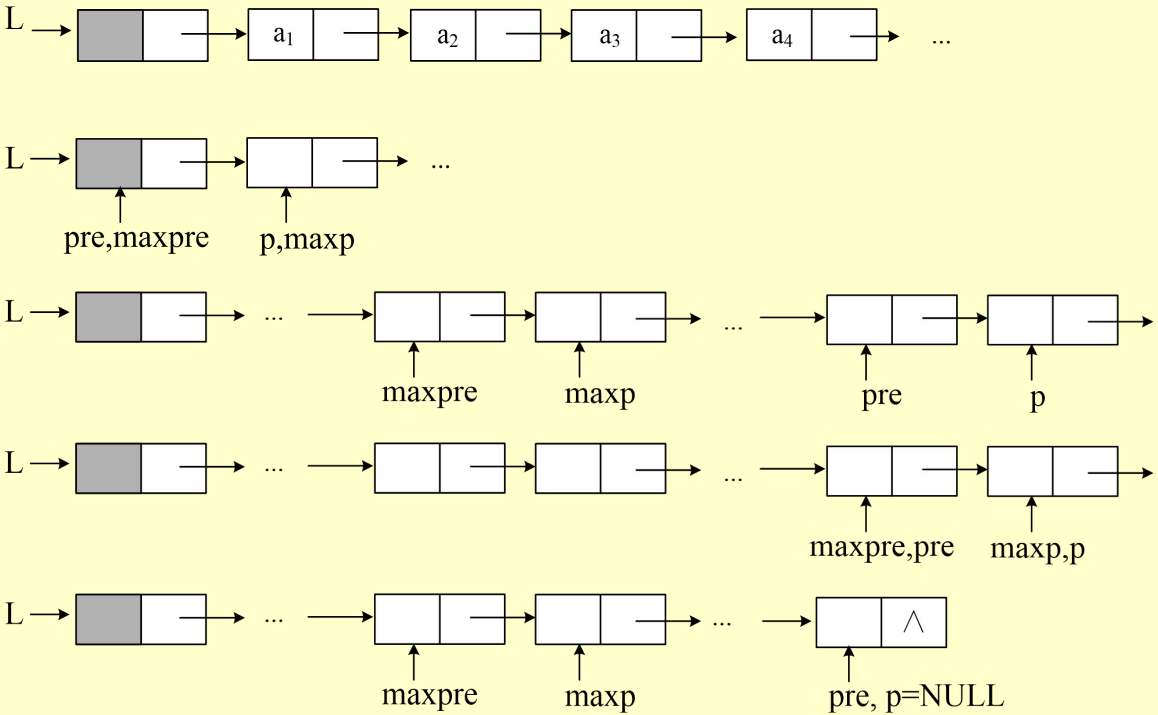
L1直接使用L的空间即可！

```
void split(LinkList *&L,LinkList *&L1,LinkList *&L2)
{
   LinkList *p=L->next,*q,*r1;
   L1=L;
   r1=L1;
   L2=(LinkList *)malloc(sizeof(LinkList));
   L2->next=NULL;
   while (p!=NULL)
   {
      r1->next=p;
      r1=p;
      p=p->next;
      q=p->next;
      p->next=L2->next;
      L2->next=p;
      p=q;
   }
   r1->next=NULL;
}
```



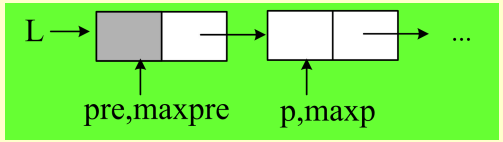
例：删除元素最大的节点

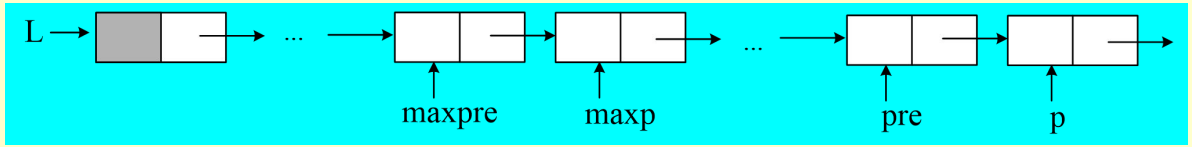
- 设计一个算法，删除一个单链表L中元素值最大的节点。

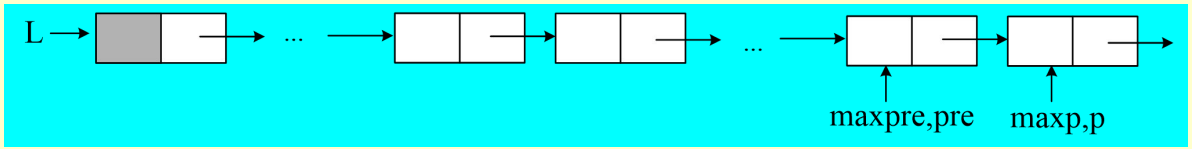


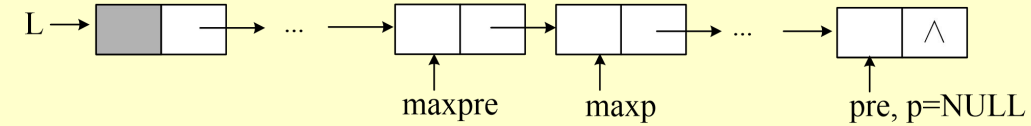
删除元素最大的节点

```
void delmaxnode(LinkList *&L)
{
   LinkList *p=L->next,*pre=L,*maxp=p,*maxpre=pre;
   while (p!=NULL)
   {
      if (maxp->data < p->data)
      {
         maxp=p;
         maxpre=pre;
      }
      pre=p;
      p=p->next;
   }
   maxpre->next=maxp->next;
   free(maxp);
}
```









例：增序排列节点

- 问题：有一个带头节点的单链表L（至少有一个数据节点），设计一个算法使其元素递增有序排列。

```
void sort(LinkList *&L)
{
   LinkList *p,*pre,*q;
   p=L->next->next;
   L->next->next=NULL;
   while (p!=NULL)
   {
      q=p->next;
      pre=L;
      while (pre->next!=NULL && pre->next->data<p->data)
         pre=pre->next;
      p->next=pre->next;
      pre->next=p;
      p=q;
   }
}
```