

第 9 章 用户自己建立数据类型

3.

```
#include <stdio.h>
#define N 5
struct student
{ char num[6];
  char name[8];
  int score[3];
}stu[N];
void print(struct student stu[])
{ int i,j;
  printf("\n NO.      name      score1   score2   score3\n");
  for (i=0;i<N;i++)
  { printf("%5s%10s",stu[i].num,stu[i].name);
    for (j=0;j<3;j++)
      printf("%9d",stu[i].score[j]);
    printf("\n");
  }
}
int main()
{ int i,j;
  for (i=0;i<N;i++)
  { printf("\ninput score of student %d:\n",i+1);
    printf("NO.: ");
    scanf("%s",stu[i].num);
    printf("name: ");
    scanf("%s",stu[i].name);
    for (j=0;j<3;j++)
    { printf("score %d:",j+1);
      scanf("%d",&stu[i].score[j]);
    }
    printf("\n");
  }
  print(stu);
  return 0;
}
```

5.

```
#include <stdio.h>
#define N 3
struct student
{ char num[6];
```

```

char name[8];
float score[3];
float avr;
} stu[N];
int main()
{ int i,j,maxi;
  float sum,max,average;
  for (i=0;i<N;i++)
  { printf("input scores of student %d:\n",i+1);
    printf("NO.:");
    scanf("%s",stu[i].num);
    printf("name:");
    scanf("%s",stu[i].name);
    for (j=0;j<3;j++)
      { printf("score %d:",j+1);
        scanf("%f",&stu[i].score[j]);
      }
  }
  average=0;
  max=0;
  maxi=0;
  for (i=0;i<N;i++)
  { sum=0;
    for (j=0;j<3;j++)
      sum+=stu[i].score[j];
    stu[i].avr=sum/3.0;
    average+=stu[i].avr;
    if (sum>max)
      { max=sum;
        maxi=i;
      }
  }
  average/=N;
  printf("   NO.      name    score1    score2    score3      average\n");
  for (i=0;i<N;i++)
  { printf("%5s%10s",stu[i].num,stu[i].name);
    for (j=0;j<3;j++)
      printf("%9.2f",stu[i].score[j]);
    printf("      %8.2f\n",stu[i].avr);
  }
  printf("average=%5.2f\n",average);
  printf("The highest score is : student %s,%s\n",stu[maxi].num,stu[maxi].name);
  printf("his scores are:%6.2f,%6.2f,%6.2f,average:%5.2f.\n",
    stu[maxi].score[0],stu[maxi].score[1],stu[maxi].score[2],stu[maxi].avr);

```

```

    return 0;
}

```

12.

```

#include <stdio.h>
#include <malloc.h>
#define LEN sizeof(struct student)
struct student
{
    char num[6];
    char name[8];
    char sex[2];
    int age;
    struct student *next;
} stu[10];

int main()
{
    struct student *p,*pt,*head;
    int i,length,iage,flag=1;
    int find=0;           //找到待删除元素 find=1,否则 find=0
    while (flag==1)
    {
        printf("input length of list(<10):");
        scanf("%d",&length);
        if (length<10)
            flag=0;
    }
    //建立链表
    for (i=0;i<length;i++)
    {
        p=(struct student *) malloc(LEN);
        if (i==0)
            head=pt=p;
        else
            pt->next=p;
        pt=p;
        printf("NO.:");
        scanf("%s",p->num);
        printf("name:");
        scanf("%s",p->name);
        printf("sex:");
        scanf("%s",p->sex);
        printf("age:");
        scanf("%d",&p->age);
    }
    p->next=NULL;
}

```

```

p=head;
printf("\n NO.    name    sex  age\n");    //显示
while(p!=NULL)
    {printf("%4s%8s%6s%6d\n",p->num,p->name,p->sex,p->age);
      p=p->next;
    }

    // 删除
printf("input age:");    //输入待删年龄
scanf("%d",&iage);
pt=head;
p=pt;
if (pt->age==iage)    //链头是待删元素
    {p=pt->next;
      head=pt=p;
      find=1;
    }
else    //链头不是待删元素
    pt=pt->next;
while (pt!=NULL)
    {if (pt->age==iage)
        {p->next=pt->next;
          find=1;
        }
      else    // 中间结点不是待删元素
          p=pt;
          pt=pt->next;
    }
if (!find)
    printf(" not found  %d.",iage);

p=head;
printf("\n NO.    name    sex  age\n"); //显示结果
while (p!=NULL)
    {printf("%4s%8s",p->num,p->name);
      printf("%6s%6d\n",p->sex,p->age);
      p=p->next;
    }
return 0;
}

```

6.
(方法一)

```

#define N 13
struct person
{int number;
  int nextp;
}link[N+1];
main()
{int i,count,h;
  for(i=1;i<=N;i++)
  {if(i==N)link[i].nextp=1;
   else link[i].nextp=i+1;
   link[i].number=i;
  }
  count=0;
  h=N;
  printf("sequence that person leave the circle:\n");
  while(count<N-1)
  {i=0;
   while(i!=3)
   {h=link[h].nextp;
    if(link[h].number)i++;
   }
   printf("%4d",link[h].number);
   link[h].number=0;
   count++;
  }
  printf("\nThe last one is:");
  for(i=1;i<=N;i++)
   if(link[i].number)printf("%3d",link[i].number);
}

```

（方法二）

```

#include <stdio.h>
#define N 13
main()
{int i,j,k,a[N+1],*p;
  for(i=0,p=a;p<=a+N;i++,p++)
   *p=i;
  p=a+1;k=N;
  for(i=0,j=1;k!=1;j++)
  {if(p>(a+N))
   p=a+1;
   if(*p!=0) i++;
   if((i-3)==0)
   {*p=0;i=0;k--;}
  }
  p++;
}

```

```
}  
for(i=1;i<=N;i++)  
    if(a[i]!=0)printf("The last number is %d\n",a[i]);  
}
```