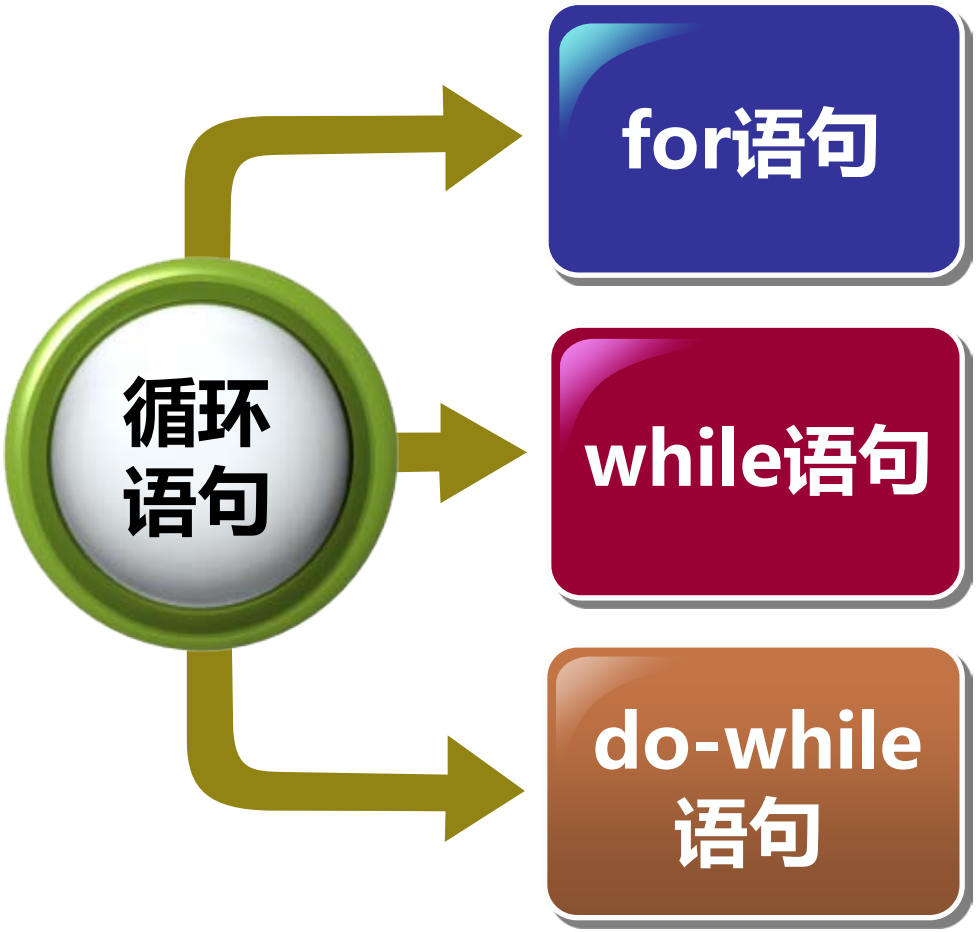
第5章 循环控制

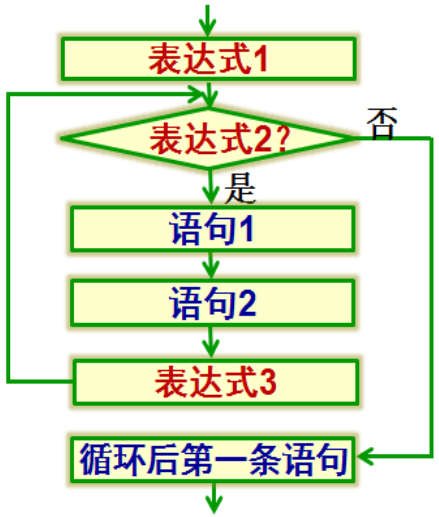
while和do while语句

循环语句



while语句

```
for (表达式1； 表达式2; 表达式3)
{
        语句1
        语句2
}
```




```
表达式1;
while (表达式2)
{
    语句1
    语句2
    表达式3;
}
```

循环初始条件

循环控制条件

循环转化条件

- 当型循环——Condition is tested first

do-while语句

```
表达式1;
while (表达式2)
{
    语句1
    语句2
    表达式3;
}
```

```
表达式1;
do{
    语句1
    语句2
    表达式3;
}while (表达式2);
```

循环初始条件

循环转化条件

循环控制条件

当型循环——
Condition is tested first

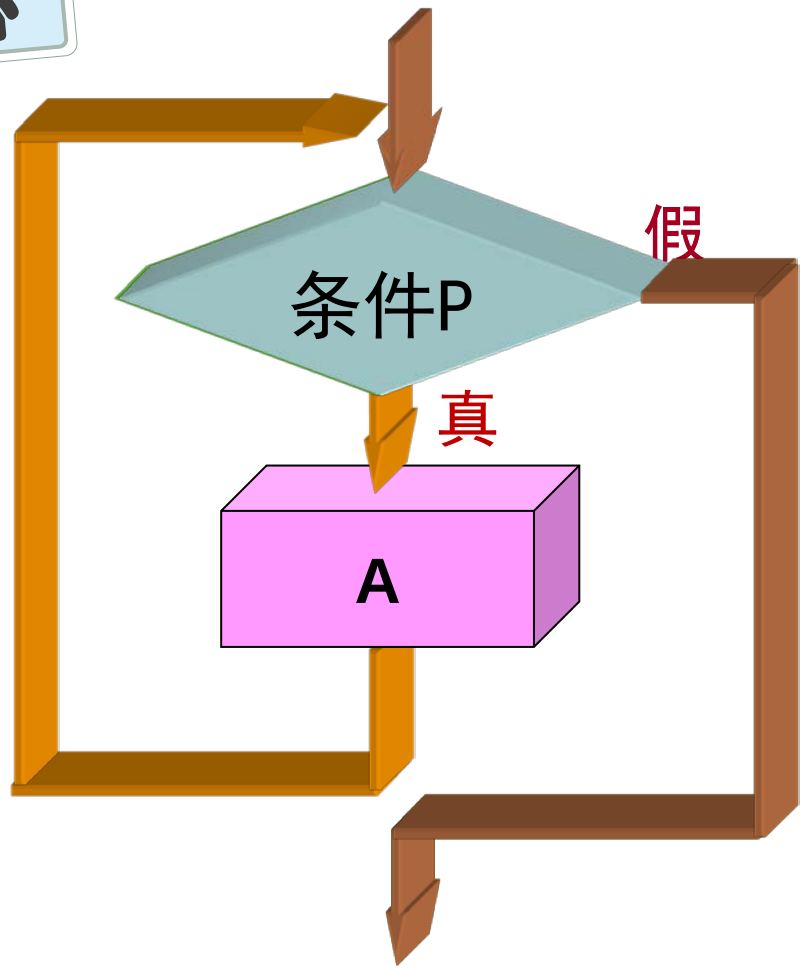
直到型循环——
Condition is tested last

while与do-while的区别

当型循环

Testing Loop Condition First

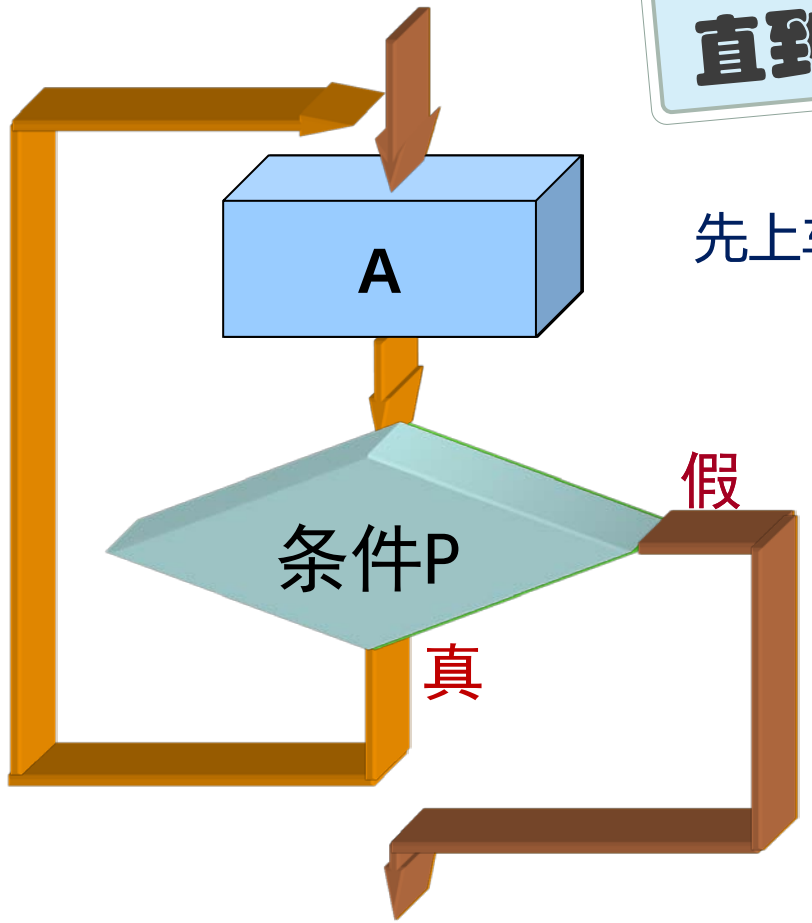
先检票后上车



直到型循环

Testing Loop Condition last

先上车后检票



计数控制的循环

- 输入n个数，显示其最后累加求和的结果

```
#include  <stdio.h>
int main()
{
   int i, sum = 0, m, n;
   printf("Input n:");
   scanf("%d", &n);
   for (i=0; i<n; i++)
   {
       printf("Input m:");
       scanf("%d", &m);
       sum = sum + m;
   }
   printf("sum = %d\n", sum);
   return 0;
}
```

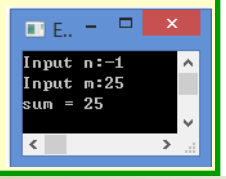

```
#include  <stdio.h>
int main()
{
   int i, sum = 0, m, n;
   printf("Input n:");
   scanf("%d", &n);
   i = 0;
   while (i < n)
   {
       printf("Input m:");
       scanf("%d", &m);
       sum = sum + m;
       i++;
   }
   printf("sum = %d\n", sum);
   return 0;
}
```

计数控制的循环

直到型循环

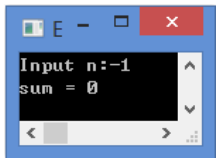
问题：这两个程序在何时运行结果不一样？

```
#include  <stdio.h>
int main()
{
   int i, sum = 0, m, n;
   printf("Input n:");
   scanf("%d", &n);
   i = 0;
   do{
       printf("Input m:");
       scanf("%d", &m);
       sum = sum + m;
       i++;
   }while (i < n);
   printf("sum = %d\n", sum);
   return 0;
}
```



当型循环

```
#include  <stdio.h>
int main()
{
   int i, sum = 0, m, n;
   printf("Input n:");
   scanf("%d", &n);
   i = 0;
   while (i < n)
   {
       printf("Input m:");
       scanf("%d", &m);
       sum = sum + m;
       i++;
   }
   printf("sum = %d\n", sum);
   return 0;
}
```



计数控制的循环

- 输入n个数，显示其**最后**累加求和的结果
- 显示**每次**累加求和的结果


```
#include  <stdio.h>
int main()
{
   int i, sum = 0, m, n;
   printf("Input n:");
   scanf("%d", &n);
   for (i=0; i<n; i++)
   {
       printf("Input m:");
       scanf("%d", &m);
       sum = sum + m;
   }
   printf("sum = %d\n", sum);
   return 0;
}
```

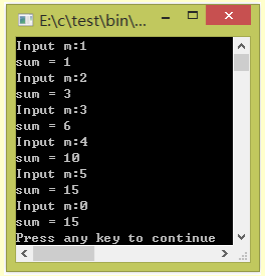
```
#include  <stdio.h>
int main()
{
   int i, sum = 0, m, n;
   printf("Input n:");
   scanf("%d", &n);
   for (i=0; i<n; i++)
   {
       printf("Input m:");
       scanf("%d", &m);
       sum = sum + m;
       printf("sum = %d\n", sum);
   }
   return 0;
}
```

标记控制的循环

输入数据，显示每次累加的结果，直到输入0时为止

循环次数未知

```
#include  <stdio.h>
int main()
{
   int sum = 0, m;
   do{
       printf("Input m:");
       scanf("%d", &m);
       sum = sum + m;
       printf("sum = %d\n", sum);
   }while (m != 0);
   return 0;
}
```

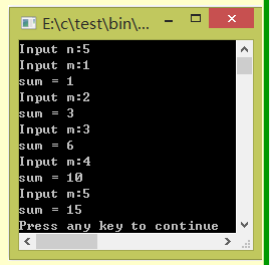


标记值（Sentinel Value）

显示每次累加求和的结果

循环次数已知

```
#include  <stdio.h>
int main()
{
   int i, sum = 0, m, n;
   printf("Input n:");
   scanf("%d", &n);
   for (i=0; i<n; i++)
   {
       printf("Input m:");
       scanf("%d", &m);
       sum = sum + m;
       printf("sum = %d\n", sum);
   }
   return 0;
}
```



讨论

- 输入数据，显示每次累加的结果，直到输入0时为止。
- 修改下面这个用do-while语句实现的程序，改用while语句实现，并对比其优缺点。

```
#include  <stdio.h>
int main()
{
   int sum = 0, m;
   do{
       printf("Input m:");
       scanf("%d", &m);
       sum = sum + m;
       printf("sum = %d\n", sum);
   }while (m != 0);
   return 0;
}
```