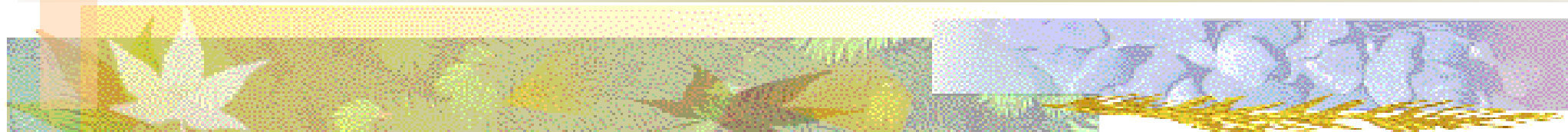




第5章 循环控制

——while和do-while语句

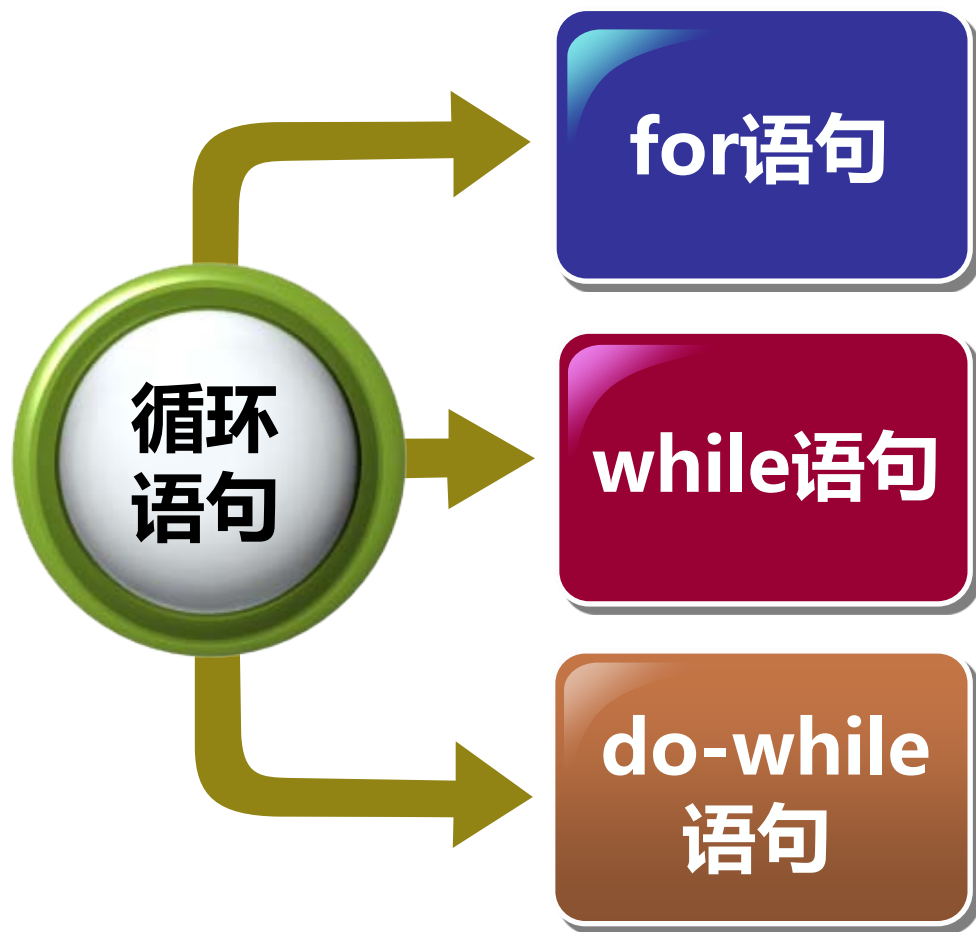


哈尔滨工业大学

苏小红

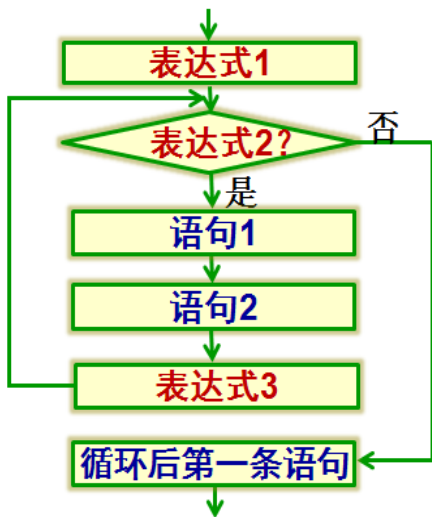
sxh@hit.edu.cn

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;  
}
```

当型循环——
Condition is tested **first**

```
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

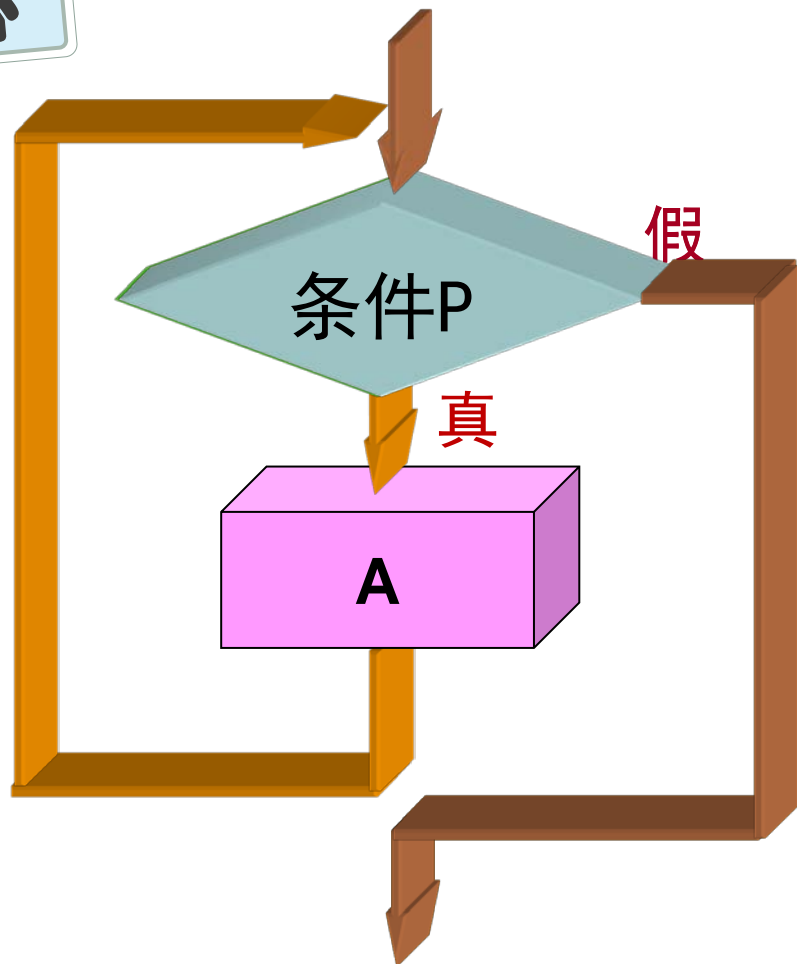
直到型循环——
Condition is tested **last**

while与do-while的区别

当型循环

Testing Loop Condition **First**

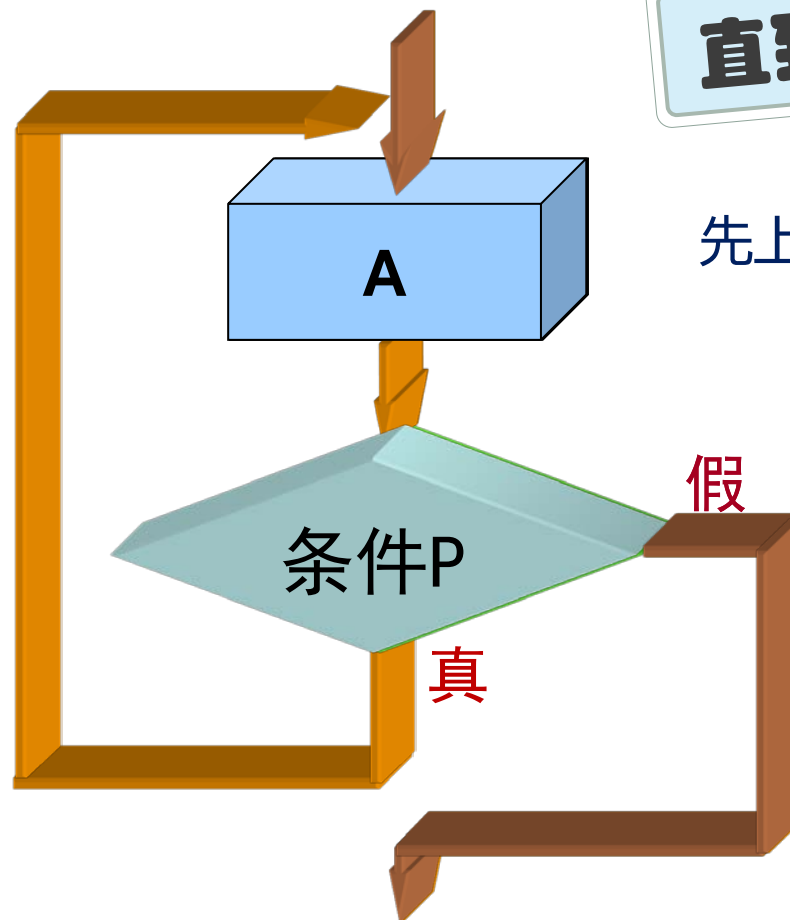
先检票后上车



Testing Loop Condition **last**

直到型循环

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

当型循环

```
#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;
}
```

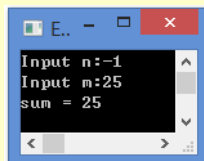
计数控制的循环

直到型循环

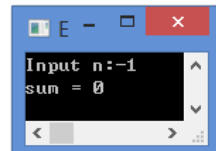
问题：这两个程序在何时运行结果不一样？

当型循环

```
#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;
}
```



```
#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

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;
}
```



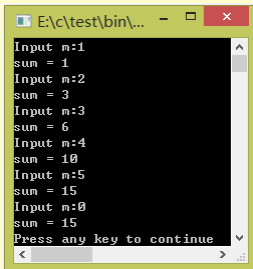
```
#include <stdio.h>
int main()
{
    int i, sum = 0, m, n;
    printf("Input n:");
    scanf("%d", &n);
    for (i=0; i<n; i++)
    {
        printf("Input m:");
        scanf("%d", &m);
        sum = sum + m;
        printf("sum = %d\n", sum);
    }
    return 0;
}
```


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;
}
```

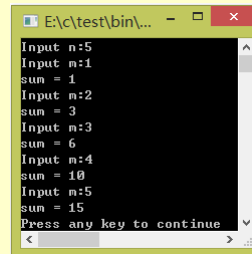


标记值 (Sentinel Value)

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;
}
```



