



第4章 分支控制

——多分支选择控制与开关语句



哈尔滨工业大学

苏小红

sxh@hit.edu.cn

本节要讨论的主要问题

- 在C语言中如何实现多分支控制？
- break和default在switch语句中的作用是什么？



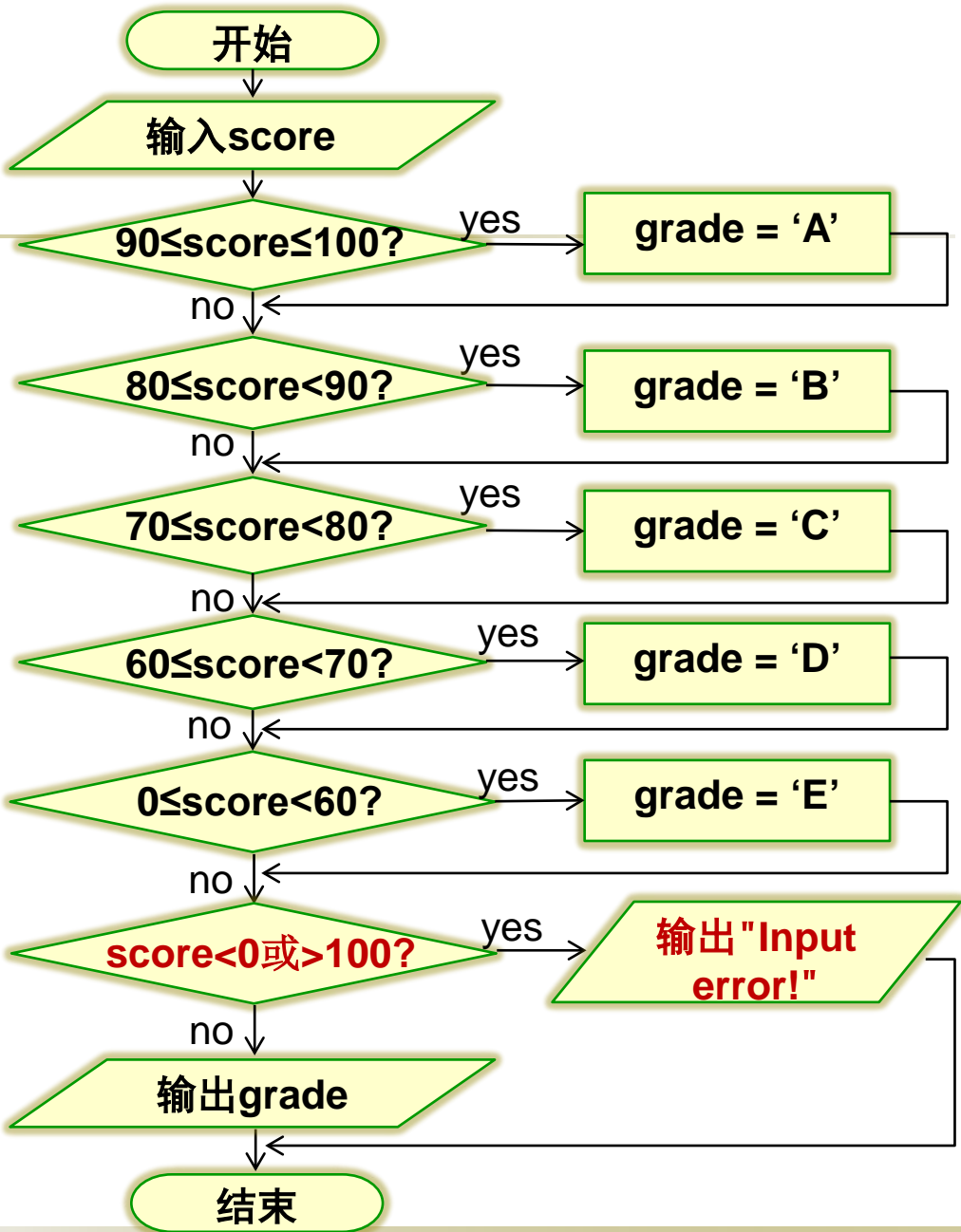
条件语句



一个实例

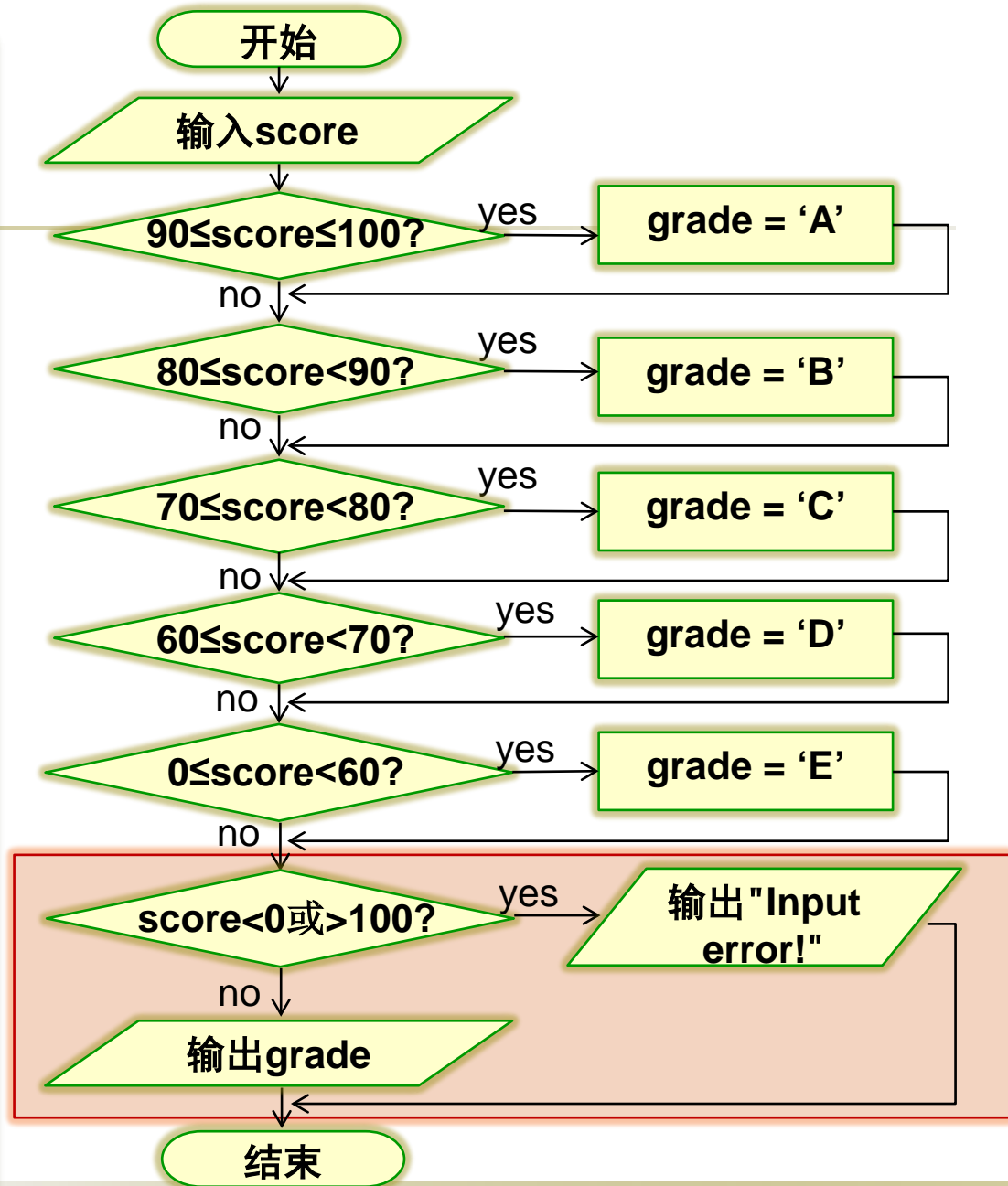
■ 百分制成绩转换为五分制成绩

grade = {	A	$90 \leq \text{score} \leq 100$
	B	$80 \leq \text{score} < 90$
	C	$70 \leq \text{score} < 80$
	D	$60 \leq \text{score} < 70$
	E	$0 \leq \text{score} < 60$



第4章 分支控制

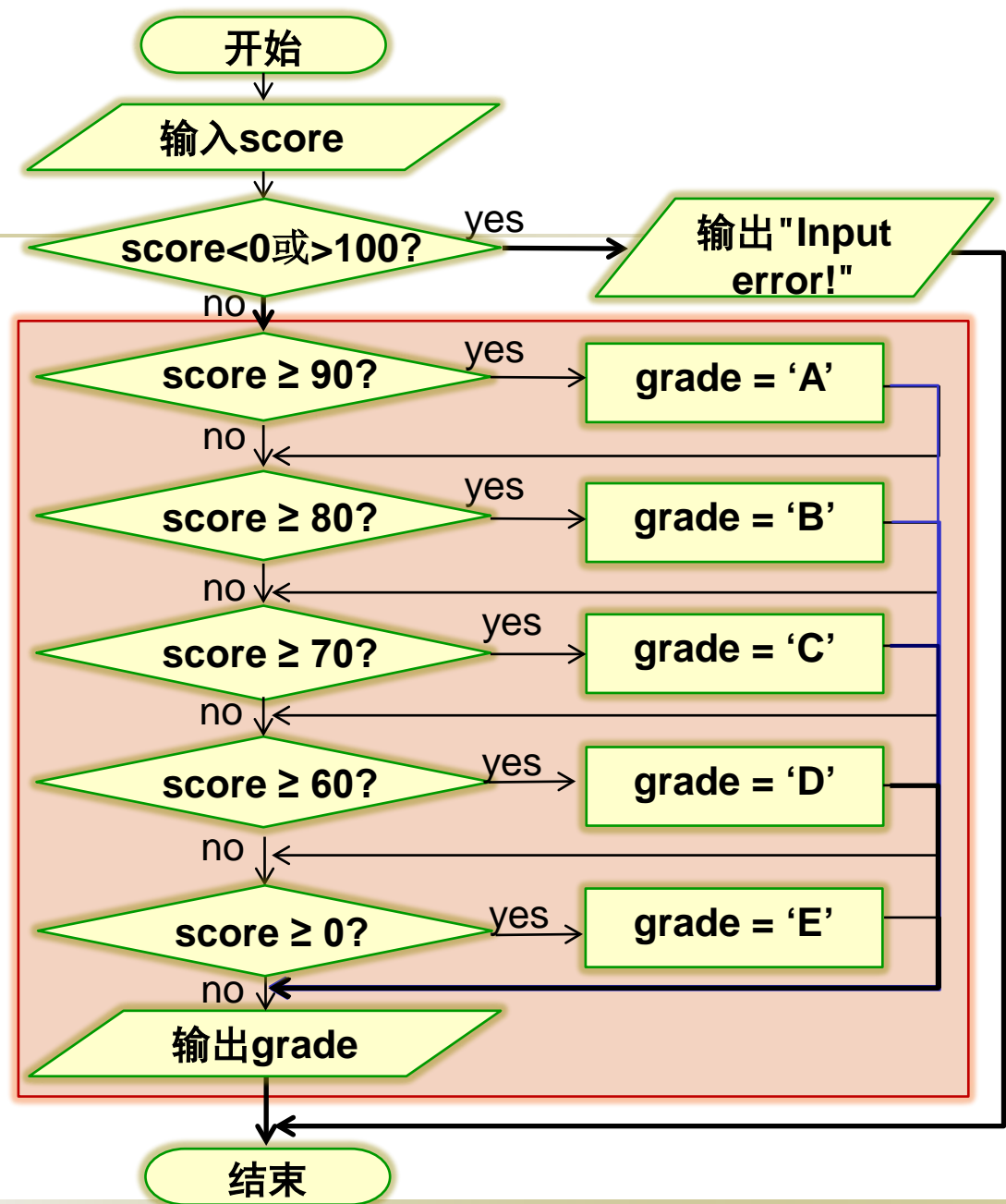
```
#include<stdio.h>
int main()
{
    int score;
    char grade;
    printf("Please input  score:");
    scanf("%d", &score);
    if (score >= 90 && score <= 100)
        grade = 'A';
    if (score >= 80 && score < 90)
        grade = 'B';
    if (score >= 70 && score < 80)
        grade = 'C';
    if (score >= 60 && score < 70)
        grade = 'D';
    if (score >= 0 && score < 60)
        grade = 'E';
    if (score < 0 || score > 100)
        printf("Input error!\n");
    else
        printf("grade:%c\n", grade);
    return 0;
}
```



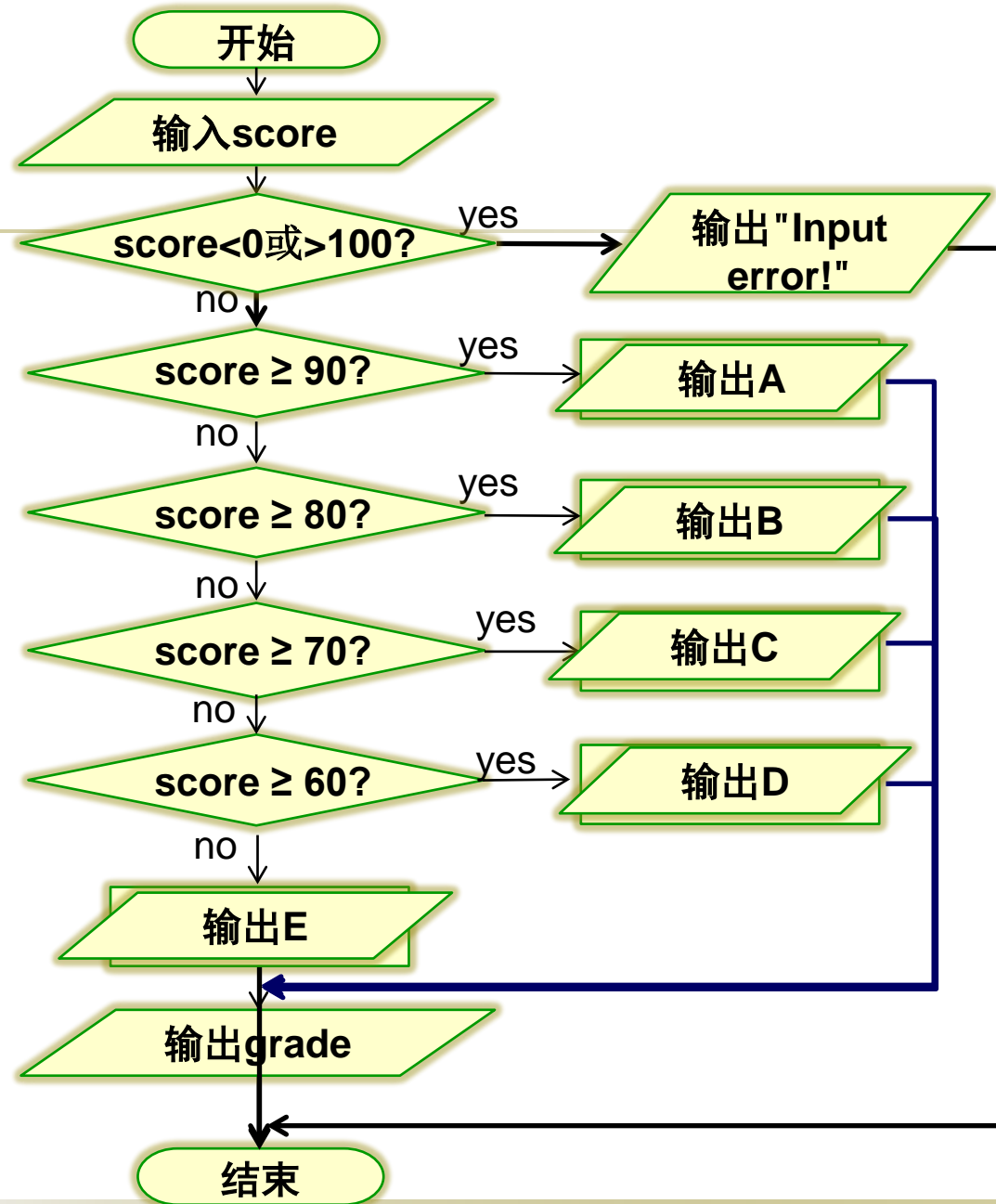
```

#include<stdio.h>
int main()
{
    int score;
    char grade;
    printf("Please input  score:");
    scanf("%d", &score);
    if (score < 0 || score > 100)
    {
        printf("Input error!\n");
    }
    else
    {
        if (score >= 90)
            grade = 'A';
        else if (score >= 80)
            grade = 'B';
        else if (score >= 70)
            grade = 'C';
        else if (score >= 60)
            grade = 'D';
        else
            grade = 'E';
        printf("grade:%c\n", grade);
    }
    return 0;
}

```



```
#include<stdio.h>
int main()
{
    int score;
    printf("Please input score:");
    scanf("%d", &score);
    if (score < 0 || score > 100)
        printf("Input error!\n");
    else if (score >= 90)
        printf("grade:A\n");
    else if (score >= 80)
        printf("grade:B\n");
    else if (score >= 70)
        printf("grade:C\n");
    else if (score >= 60)
        printf("grade:D\n");
    else
        printf("grade:E\n");
    return 0;
}
```

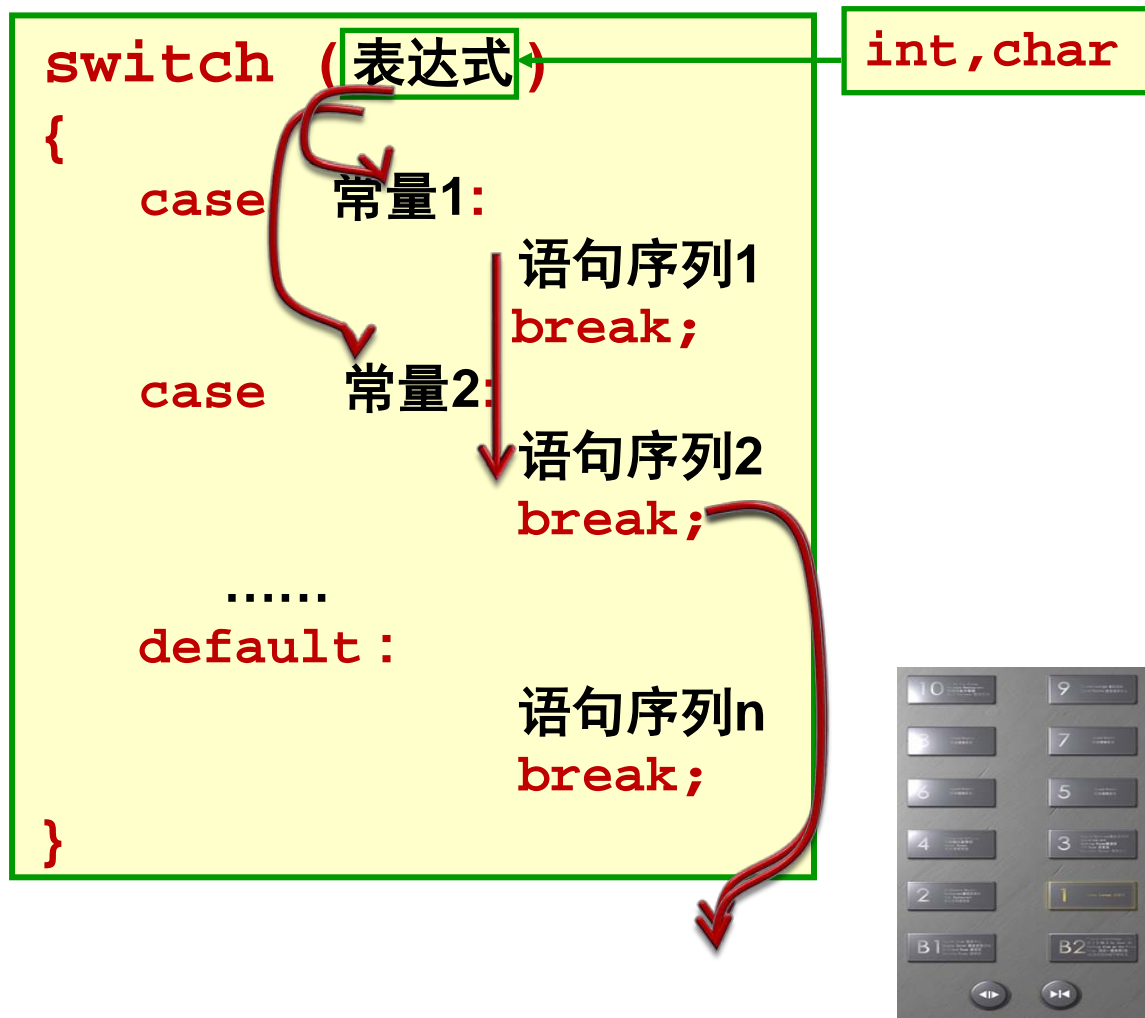


```

#include<stdio.h>
int main()
{
    int score, mark;
    printf("Please input  score:");
    scanf("%d", &score);
    mark = score / 10;
    switch (mark)
    {
        case 0:
        case 1:
        case 2:
        case 3:
        case 4:
        case 5: printf("garde:E\n");
                break;
        case 6: printf("garde:D\n");
                break;
        case 7: printf("garde:C\n");
                break;
        case 8: printf("garde:B\n");
                break;
        case 9:
        case 10: printf("garde:A\n");
                break;
        default: printf("input error!\n");
    }
    return 0;
}

```

switch语句




```

#include<stdio.h>
int main()
{
    int score, mark;
    printf("Please input  score:");
    scanf("%d", &score);
    mark = score / 10;
    switch (mark)
    {
        case 0:
        case 1:
        case 2:
        case 3:
        case 4:
        case 5:
        case 6:
        case 7:
        case 8:
        case 9:
        case 10:
        default:
    }
    return 0;
}

```

case 60~69
case 60<=score<69

printf("garde:E\n");
break;
printf("garde:D\n");
break;
printf("garde:C\n");
break;
printf("garde:B\n");
break;
printf("garde:A\n");
break;
printf("Input error!\n");

switch语句

switch (表达式)

语句标号作用

```

{
    case 常量1:
        语句序列1
        break;

    case 常量2:
        语句序列2
        break;

    .....
    default :
        语句序列n
        break;
}

```



```

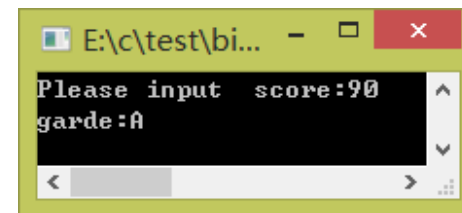
#include<stdio.h>
int main()
{
    int score, mark;
    printf("Please input  score:");
    scanf("%d", &score);
    mark = score / 10;
    switch (mark)
    {
        case 0:
        case 1:
        case 2:
        case 3:
        case 4:
        case 5:    printf("garde:E\n");
                  break;
        case 6:    printf("garde:D\n");
                  break;
        case 7:    printf("garde:C\n");
                  break;
        case 8:    printf("garde:B\n");
                  break;
        case 9:
        case 10:   printf("garde:A\n");
                  break;
        default:   printf("Input error!\n");
    }
    return 0;
}

```

switch语句

■ 程序测试，尽量覆盖所有分支（路径）

- * 0, 15, 25, 35, 45, 55——E
- * 65——D
- * 75——C
- * 85——B
- * 95——A
- * 100——A
- * 还有吗?
- * -10, 110
- * 够了吗?
- * -5, 105

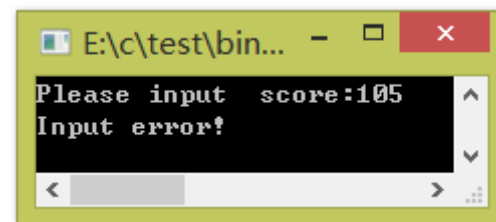


```

#include<stdio.h>
int main()
{
    int score, mark;
    printf("Please input  score:");
    scanf("%d", &score);
    mark = score>=0&&score<=100 ? score/10 : -1;
    switch (mark)
    {
        case 0:
        case 1:
        case 2:
        case 3:
        case 4:
        case 5:    printf("garde:E\n");
                   break;
        case 6:    printf("garde:D\n");
                   break;
        case 7:    printf("garde:C\n");
                   break;
        case 8:    printf("garde:B\n");
                   break;
        case 9:
        case 10:   printf("garde:A\n");
                   break;
        default:   printf("Input error!\n");
    }
    return 0;
}

```

switch语句



```
#include<stdio.h>
int main()
{
    int score;
    char grade;
    printf("Please input  score:");
    scanf("%d", &score);
    if (score < 0 || score > 100)
        printf("Input error!\n");
    else if (score >= 90)
        grade = 'A';
    else if (score >= 80)
        grade = 'B';
    else if (score >= 70)
        grade = 'C';
    else if (score >= 60)
        grade = 'D';
    else
        grade = 'E';
    printf("grade:%c\n", grade);
    return 0;
}
```

讨论

- 这个程序正确吗？如果不正确，请指出错在哪里。



