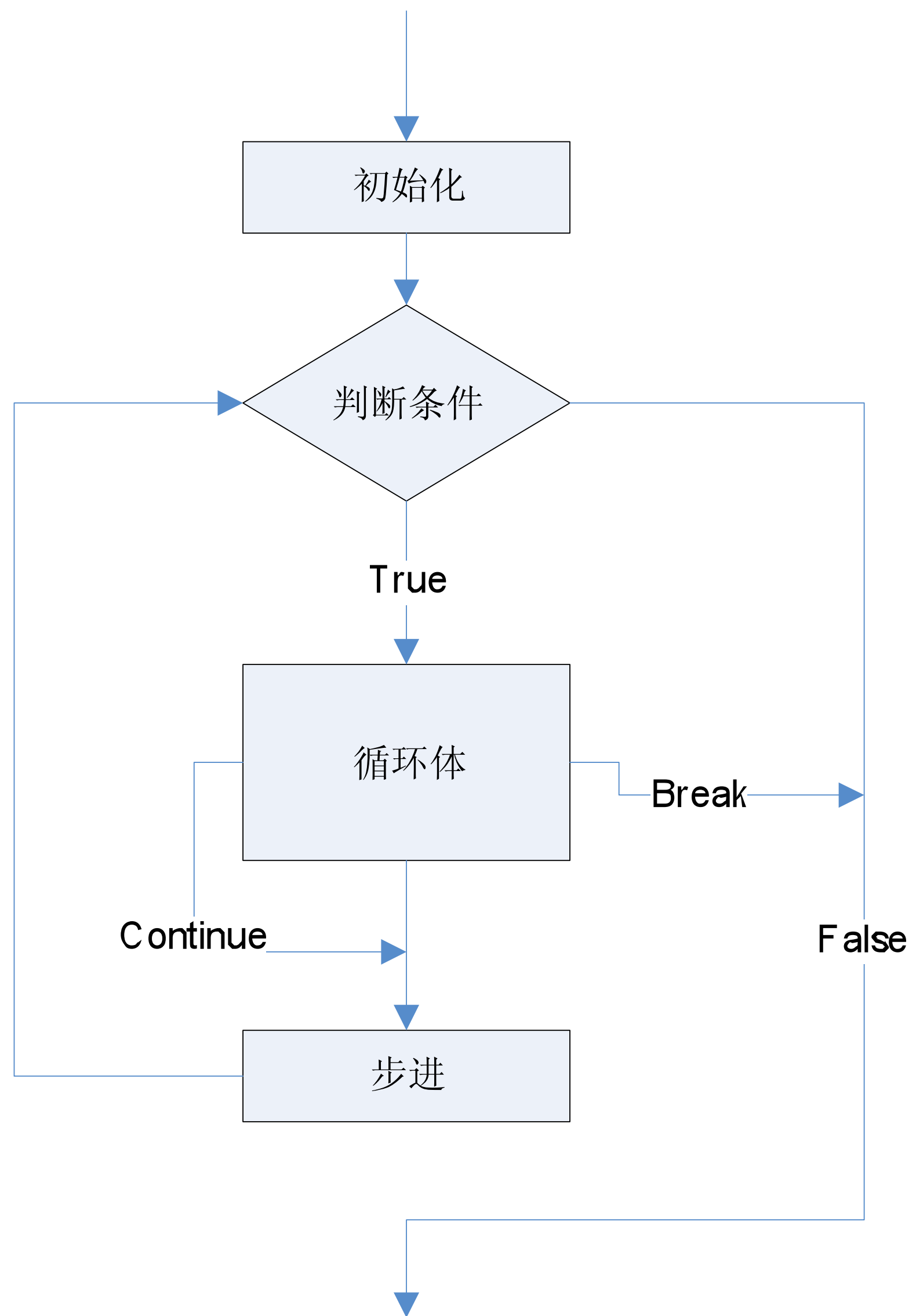# 循环控制

素数

- 只能被1和自己整除的数，不包括1
  - 2, 3, 5, 7, 11,13,17, 19....

break vs continue

- **break:** 跳出循环
- **continue:** 跳过循环这一轮剩下的语句进入下一轮

break vs continue

嵌套的循环

100以内的素数

- 如何写程序输出100以内的素数？

嵌套的循环

- 循环里面还是循环

前50个素数

- 如何写程序输出前50个素数

嵌套循环时的break

凑硬币

- 如何用1角、2角和5角的硬币凑出10元以下的金额呢？

```c
int x;
int one, two, five;

scanf("%d", &x);
for ( one = 1; one < x*10; one++ ) {
    for ( two = 1; two < x*10/2; two++ ) {
        for ( five = 1; five < x*10/5; five++ ) {
            if ( one + two*2 + five*5 == x*10 ) {
                printf("可以用%d个1角加%d个2角加%d个5角得到%d元\n",
                    one, two, five, x);
            }
        }
    }
}
```

break和continue

- 只能对它所在的那层循环做

接力break

```c
int x;
int one, two, five;
int exit = 0;

scanf("%d", &x);
for ( one = 1; one < x*10; one++ ) {
    for ( two = 1; two < x*10/2; two++ ) {
        for ( five = 1; five < x*10/5; five++ ) {
            if ( one + two*2 + five*5 == x*10 ) {
                printf("可以用%d个1角加%d个2角加%d个5角得到%d元\n",
                    one, two, five, x);
                exit = 1;
                break;
            }
        }
        if ( exit == 1 ) break;
    }
    if ( exit == 1 ) break;
}
```

goto

```c
    int x;
    int one, two, five;

    scanf("%d", &x);
    for ( one = 1; one < x*10; one++ ) {
        for ( two = 1; two < x*10/2; two++ ) {
            for ( five = 1; five < x*10/5; five++ ) {
                if ( one + two*2 + five*5 == x*10 ) {
                    printf("可以用%d个1角加%d个2角加%d个5角得到%d元\n",
                        one, two, five, x);
                    goto out;
                }
            }
        }
    }
out:
    return 0;
```