

1.4.4控制语句_循环语句while

- while语句:

```
1  while (<表达式>)  
2      <语句>
```

其中, <表达式>是循环条件表达式, 为真时执行循环体中的语句, 为假时终止循环。

- do-while语句:

```
1  do  
2      <语句>  
3  while (<表达式>;
```

- do-while语句与while语句功能类似, 只是循环条件的判断是在循环语句的末尾进行。do-while语句的循环体至少执行一次。

例子

```
1  #include <bits/stdc++.h>  
2  using namespace std;  
3  
4  void eg2_16()  
5  {  
6      string str_Response;  
7      const string str_Anser = "London bridge is falling down";  
8  
9      cout << "What is the answer to the riddle?" << endl;  
10     getline(cin, str_Response);  
11     while (str_Response != str_Anser)  
12     {  
13         cout << "Wrong answer, try again!" << endl;  
14         getline(cin, str_Response);  
15     }  
16     cout << "Correct answer!" << endl;  
17 }  
18 int main()  
19 {  
20     eg2_14();  
21     return 0;  
22 }
```

```
1  #include <bits/stdc++.h>  
2  using namespace std;  
3  
4  void eg2_17() //输出2~100之间所有的素数  
5  {  
6      int n = 2, i, tag;  
7      cout << n << " ";  
8      for (n = 3; n <= 100; n+=2)  
9      {  
10         tag = 0;
```

```

11         for (i = 2; tag==0 && i <= sqrt(n); i++)
12             if (n % i == 0) tag = 1;
13             if (tag == 0) cout << n << " ";
14         }
15     }
16 int main()
17 {
18     eg2_17();
19     return 0;
20 }

```

终极优化版本

```

1  #include <bits/stdc++.h>
2  using namespace std;
3
4  void eg2_18() //输出2~100之间所有的素数
5  {
6      int nMax = 500, nRow = 15, counter = 1;
7      bool isPrime = true; //标记是否为素数,发现可整数则置为false
8      int outWidth = log10(nMax) + 1; //输出宽度
9
10     cout << setw(outWidth) << 2 << " "; //单独处理2
11     for (int n = 3; n <= nMax; n += 2) //从3开始,每次加2
12     {
13         isPrime = true;
14         for (int i = 2, nSqrt = sqrt(n); isPrime && i <= nSqrt; i++)
15             if (n % i == 0)
16             {
17                 isPrime = false;
18                 break;
19             }
20
21         if (isPrime)
22         {
23             cout << setw(outWidth);
24             cout << n << " ";
25             counter++;
26             if (counter%nRow == 0){
27                 cout << endl;
28                 counter = 0;
29             }
30         }
31     }
32     cout << endl;
33 }
34 int main()
35 {
36     eg2_18();
37     return 0;
38 }

```