Jiangxi University of Science and Technology

Chapter 5 Repetition

Lecture0502 The while Statement

5.2 The while Statement

THE C PROGRAMMING LANGUAGE

- The general form of the while statement is
  - **while** (**expression**)
  - **statement**;
  - the statement following the expression is executed repeatedly as long as **the expression evaluates to a non-zero value**.
  - Naturally, this means that somewhere in the while statement must be a statement **altering the tested expression's value**.

5.2 The while Statement

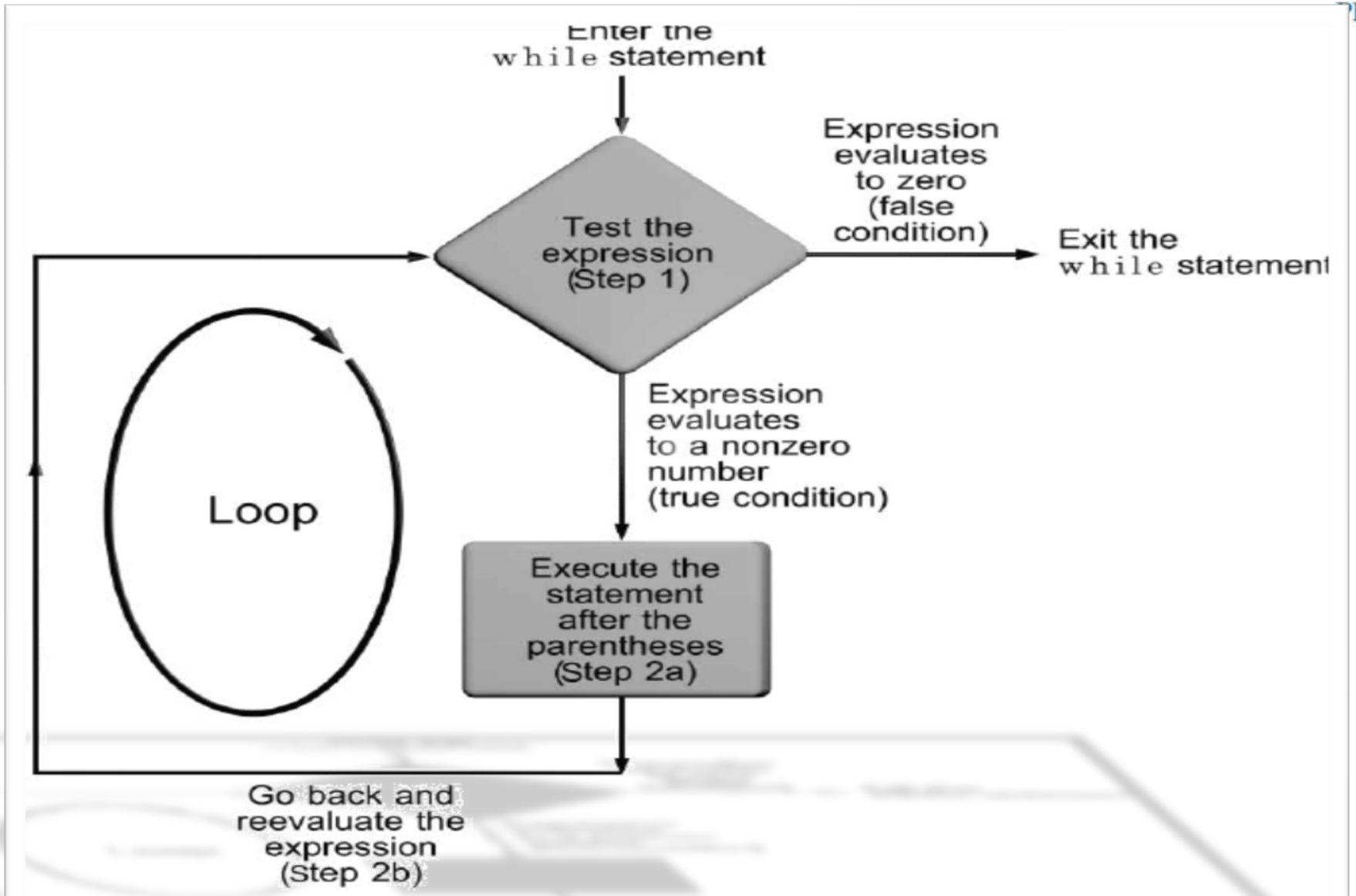

Figure 5.3 Anatomy of a while loop

5.2 The while Statement

THE C PROGRAMMING LANGUAGE

Program 5.2


```
1.  #include <stdio.h>
2.  int main(){
3.          int count;
4.          count = 1; /* initialize count */
5.          while (count <= 10)
6.          {
7.                  printf("%d ",count);
8.                  count++; /* add 1 to count */
9.          }
10.         printf("\n");  /* print a blank line */
11.         return 0;
12. }
```

5.2 The while Statement

- **Program 5.2**

```
1   #include <stdio.h>
2   int main(){
3       int count;
4       count = 1; /* initialize count */
5       while (count <= 10)
6       {
7           printf("%d ",count);
8           count++; /* add 1 to count */
9       }
10      printf("\n");  /* print a blank line */
11      return 0;
12  }
13
```

5.2 The while Statement

THE C PROGRAMMING LANGUAGE

Program 5.3


```
1.  #include <stdio.h>
2.  #define TABLESIZE 10
3.  int main(){
4.          int n;
5.          printf("NUMBER SQUARE CUBE\n");
6.          printf("------ ------ ----\n");
7.          n = 1;
8.          while (n <= TABLESIZE){
9.                  printf("%3d %7d %6d\n", n, n*n, n*n*n);
10.                 n++; /* add 1 to num */
11.         }
12.         return 0;
13. }
```

5.2 The while Statement

THE C PROGRAMMING LANGUAGE

➢ Program 5.3

```
1  #include <stdio.h>
2  #define TABLESIZE 10
3  int main(){
4      int n;
5      printf("NUMBER SQUARE CUBE\n");
6      printf("------ ------ ----\n");
7      n = 1;
8      while (n <= TABLESIZE)  {
9          printf("%3d %7d %6d\n", n, n*n, n*n*n);
10         n++; /* add 1 to num */
11     }
12     return 0;
13 }
```

n -858993460

```
NUMBER  SQUARE  CUBE
------  ------  ----
  1       1       1
  2       4       8
  3       9      27
  4      16      64
  5      25     125
  6      36     216
  7      49     343
  8      64     512
  9      81     729
 10     100    1000
```

5.2 The while Statement

THE C PROGRAMMING LANGUAGE

Program 5.4
Convert Celsius to Fahrenheit


```
1.  #include <stdio.h>
2.  #define ENDVALUE 50
3.  int main() {
4.          int celsius;
5.          float  fahren;
6.          // display the heading lines
7.          printf("DEGREES DEGREES\n");
8.          printf("CELSIUS FAHRENHEIT\n");
9.          printf("------- ----------\n");
10.         // now fill in the table using a while loop
11.         celsius = 5; /* starting Celsius value */
12.         while (celsius <= ENDVALUE){
13.                 fahren = (9.0/5.0) * celsius + 32.0;
14.                 printf("%5d %11.2f\n",celsius,fahren);
15.                 celsius = celsius + 5;
16.         }
17.         return 0;
18. }
```

5.2 The while Statement

THE C PROGRAMMING LANGUAGE

➢ **Program 5.4** Convert Celsius to Fahrenheit

```
10      // now fill in the table using a while loop
11      celsius = 5; /* starting Celsius value */
12      while (celsius <= ENDVALUE) {
13          fahren = (9.0/5.0) * celsius + 32.0;
14          printf("%5d%11.2f\n",celsius, fahren);
15          celsius = celsius + 5;
16      }
17      return 0;
18  }
```

celsius 5

fahren 41.000000

```
DEGREES  DEGREES
CELSIUS  FAHRENHEIT
-------  ----------
    5        41.00
   10        50.00
   15        59.00
   20        68.00
   25        77.00
   30        86.00
   35        95.00
   40       104.00
   45       113.00
   50       122.00
```

Reference

- BOOK
- Some part of this PPT given by Prof 欧阳城添

(Prof: Chengtian Ouyang)

- with special thank
- https://www.codingunit.com/c-tutorial-first-c-program-hello-world