

Chapter 5: Loop Structure

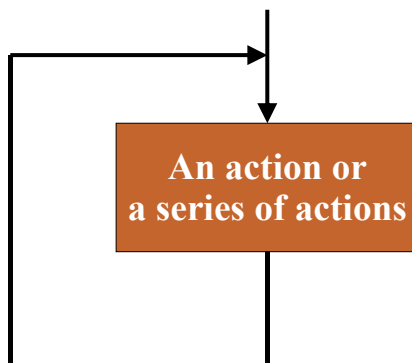
Course: 06016315 – Computer
Programming

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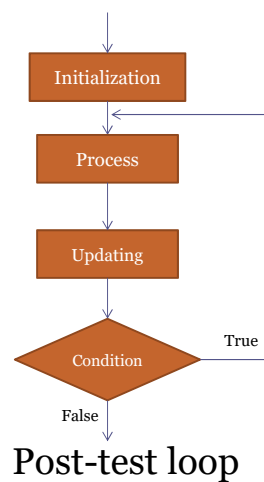
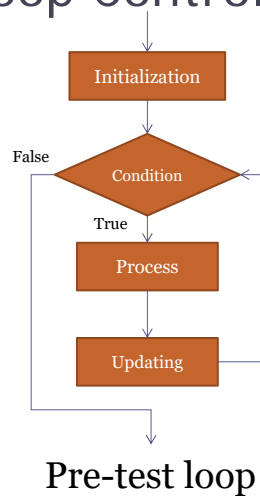
Outline

- Loop Control
 - Loop Control Variable
 - Counter Control
 - Event Control
- Loop Statements in C
 - while
 - do... while
 - for

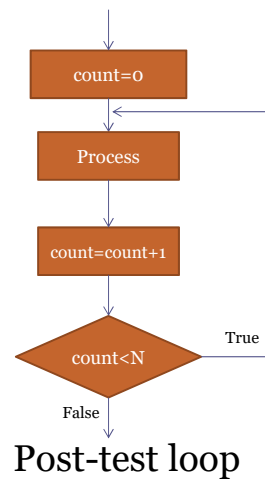
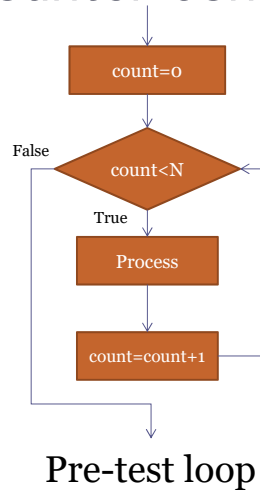
The Concept of Loop



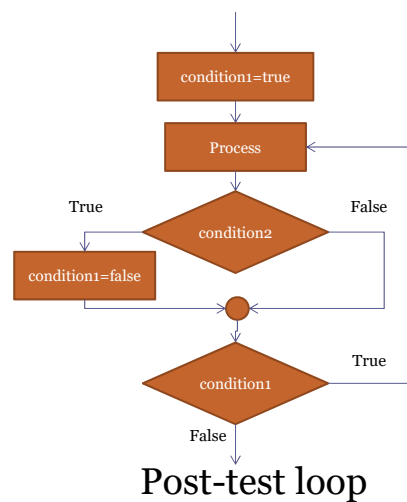
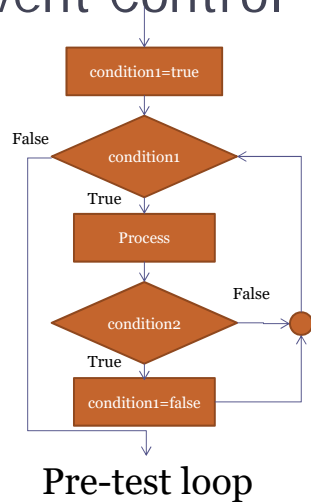
Loop Control Variable



Counter Control



Event Control



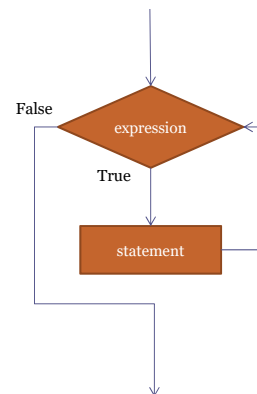
Loop Statement in C

- while – pre-test loop
- do... while – post-test loop
- for – pre-test loop

while

- Pre-test loop

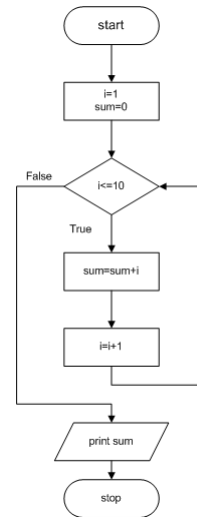
```
while (expression)
{
    statement1;
    statement2;
    ...
    statementn;
}
```



Example

```
#include<stdio.h>
int main()
{
    int i=1;
    int sum=0;
    while (i <= 10)
    {
        sum=sum+i;
        i++;
    }
    printf("%d", sum);
    return 0;
}
```

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Example

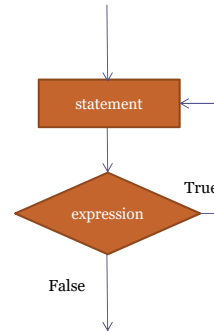
```
#include<stdio.h>
int main()
{
    int i=1;
    while (i <= 5)
    {
        printf("Hello %d\n", i);
        i++;
    }
    return 0;
}
```

```
Hello 1
Hello 2
Hello 3
Hello 4
Hello 5
```

do... while

- Post-test loop

```
do {  
    statement1;  
    statement2;  
    ...  
    statementn;  
} while (expression)
```



Example

```
#include <stdio.h>  
int main()  
{  
    int i=0;  
    while (i<10)  
    {  
        i++;  
        printf("%d ", i);  
    }  
    return 0;  
}
```

1 2 3 4 5 6 7 8 9 10

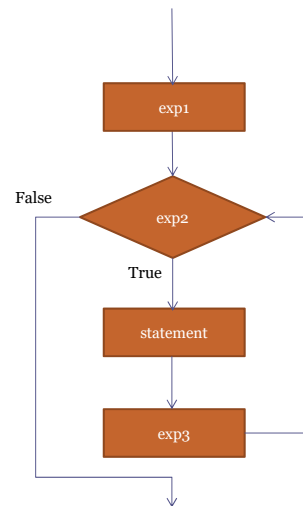
```
#include <stdio.h>  
int main()  
{  
    int i=0;  
    do {  
        i++;  
        printf("%d ", i);  
    } while (i<10);  
    return 0;  
}
```

1 2 3 4 5 6 7 8 9 10

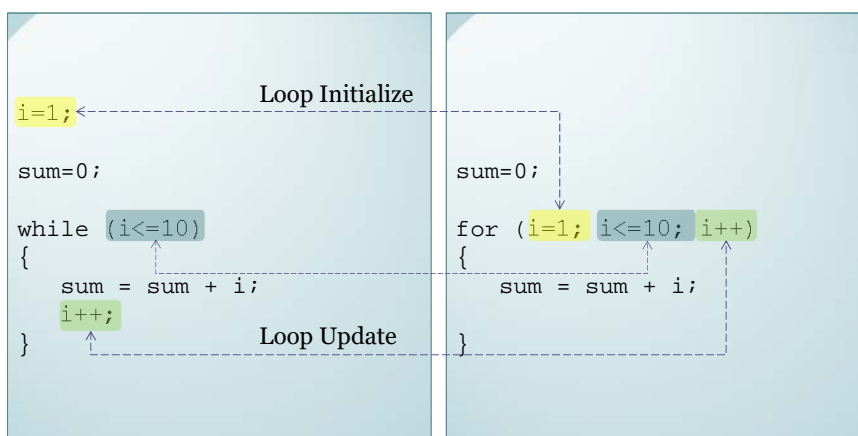
for

- Post-test loop

```
for (exp1; exp2; exp3)
{
    statement1;
    statement2;
    ...
    statementn;
}
```



for VS while



Example

```
#include<stdio.h>
int main()
{
    int i;
    for (i = 5; i > 0; i--)
        printf("%d\n", i);
    return 0;
}
```

```
5
4
3
2
1
```

Example

```
#include<stdio.h>
int main()
{
    int row;
    int col;
    int n;

    printf("\nPlease enter a number: ");
    scanf("%d", &n);
    for (row = 1; row <= n; row++) // Repeat n times
    {
        for (col = 1; col <= n; col++) // Repeat n times
            printf("A");
        printf("\n"); // New Line
    }
    return 0;
}
```

```
Please enter a number: 4
AAAA
AAAA
AAAA
AAAA
```


Example

```
#include<stdio.h>
#include<stdbool.h>
int main()
{
    bool stop = false;
    int number;

    while (!stop)
    {
        printf("\nPlease enter a number: ");
        scanf("%d", &number);
        if (number==0)
            stop=true;
    }
    printf("Program END.");
    return 0;
}
```

```
Please enter a number: 4
Please enter a number: 2
Please enter a number: 1
Please enter a number: 0
Program END.
```

while, do... while, and for?

- while – are most commonly used for event-controlled loops
- do... while – are most commonly used for event-controlled loops
- for – are most commonly used for counter-controlled loops