

CSE- 105

Structure Programming

Lecture 9

Loop : break, continue and exit

Loop

```
#include<stdio.h>
int main(void)
{
double sum, x;
sum = 0;

for (int k=1; k<=5; k++)
{
    scanf ("%lf", &x);
    if (x > 10.0)

        sum += x;
}

printf("Sum = %f \n", sum);
printf("Good Bye\n");

return 0;
}
```

```
1
2
3
14
15
Sum = 29.000000
Good Bye
Press any key to continue_
```

break statement

```
#include<stdio.h>
int main(void)
{
    double sum, x;
    sum = 0;

    for (int k=1; k<=5; k++)
    {
        scanf ("%lf", &x);
        if (x > 10.0)
            break ;
        sum += x;
    }

    printf("Sum = %f \n", sum);
    printf("Good Bye\n");

    return 0;
}
```

break;

terminates loop
execution continues with the first
statement following the loop

```
1
2
3
14
Sum = 6.000000
Good Bye
Press any key to continue_
```

If the condition is true
Jump out of the loop

break statement

```
#include<stdio.h>
int main(void)
{
    double sum, x;
    sum = 0;

    for (int k=1; k<=5; k++)
    {
        scanf ("%lf", &x);
        if (x > 10.0)
        {
            break ;
            sum += x;
        }
    }
    printf ("Sum = %f \n", sum);
    printf ("Good Bye\n");

    return 0;
}
```

```
1
2
3
14
Sum = 0.000000
Good Bye
Press any key to continue
```

sum += x;
will never execute, WHY?

continue statement

```
#include<stdio.h>
int main(void)
{
    double sum, x;
    sum = 0;

    for (int k=1; k<=5; k++)
    {
        scanf ("%lf", &x);
        if (x > 10.0)
            continue;
        sum += x;
    }

    printf("Sum = %f \n", sum);
    printf("Good Bye\n");

    return 0;
}
```

continue;

forces next iteration of the loop,
skipping any remaining
statements in the loop

If the condition is
true go to the
next iteration

```
1
2
3
14
15
Sum = 6.000000
Good Bye
Press any key to continue_
```

continue statement

```
#include<stdio.h>
int main(void)
{
    double sum, x;
    sum = 0;

    for (int k=1; k<=5; k++)
    {
        scanf ("%lf", &x);
        if (x > 10.0)
        {   continue ;
            sum += x;
        }
    }
    printf("Sum = %f \n", sum);
    printf("Good Bye\n");

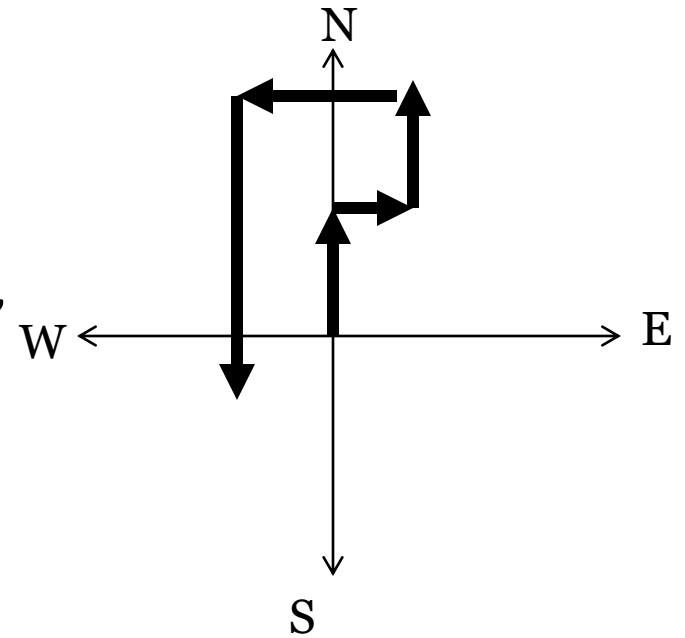
    return 0;
}
```

```
1
2
3
14
15
Sum = 0.000000
Good Bye
Press any key to continue_
```

sum += x;
Also never execute here,
WHY?

Example: A man walks

- Suppose a man (say, A) stands at $(0, 0)$ and waits for user to give him the direction and distance to go.
- User may enter N E W S for north, east, west, south, and any value for distance.
- When user enters 0 as direction, stop and print out the location where the man stopped



```
float x=0, y=0;
char direction;
float mile;
while (1) {
    printf("Please input the direction as N,S,E,W (o to exit): ");
    scanf("%c", &direction);    fflush(stdin);
    if (direction=='o'){ /*stop input, get out of the loop */
        break;
    }
    if (direction!='N' && direction!='S' && direction!='E' && direction!='W') {
        printf("Invalid direction, re-enter \n");
        continue;
    }
    printf("Please input the mile in %c direction: ", direction);
    scanf ("%f",&mile);  fflush(stdin);
    if (direction == 'N'){           /*in north, compute the y*/
        y+=mile;
    } else if (direction == 'E'){     /*in east, compute the x*/
        x+=mile;
    } else if (direction == 'W'){     /*in west, compute the x*/
        x-=mile;
    } else if (direction == 'S'){     /*in south, compute the y*/
        y-=mile;
    }
}
printf("\nCurrent position of A: (%4.2f,%4.2f)\n",x,y);    /* output A's location */
```


Example: what will be the output

```
int main()
{
    int a, b, c;
    a=5;
    while(a > 2) {
        for (b = a ; b < 2 * a ; b++ ) {
            c = a + b;
            if (c < 8) continue;
            if (c > 11) break;
            printf( "a = %d  b = %d  c = %d \n", a, b, c);
        } /* end of for-loop */
        a--;
    } /* end of while loop */
}
```

a = 5 b = 5 c = 10

a = 5 b = 6 c = 11

a = 4 b = 4 c = 8

a = 4 b = 5 c = 9

a = 4 b = 6 c = 10

a = 4 b = 7 c = 11

a = 3 b = 5 c = 8

goto statement

```
#include<stdio.h>
int main(void)
{
    double sum, x;
    sum = 0;
    Z: ←
    for (int k=1; k<=5; k++)
    {
        scanf ("%lf", &x);
        if (x > 10.0)
            goto Z;
        sum += x;
    }

    printf("Sum = %f \n", sum);
    printf("Good Bye\n");

    return 0;
}
```

If the condition is true goto label Z

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```

goto statement

```
#include<stdio.h>
int main(void)
{
    double sum, x;
    sum = 0;

    for (int k=1; k<=5; k++)
    {
        scanf ("%lf", &x);
        if (x > 10.0)
            goto Z;
        sum += x;
    }
Z:
    printf ("Sum = %f \n", sum);
    printf ("Good Bye\n");

    return 0;
}
```

If the condition is true goto label Z,
Which is now actually out of loop

```
1
2
3
14
Sum = 6.000000
Good Bye
Press any key to continue
```

Exercise

- Design the following code using goto and if-else only, i.e., **no while or for loop**

```
#include<stdio.h>
int main(void)
{

int x = 1;
int i = 1;

while (i <= 9) {
    x = x * i;
    i = i + 1;

    printf("%d    %d \n",x, i);
}

printf("Good Bye\n");

return 0;
}
```

```
1        2
2        3
6        4
24       5
120      6
720      7
5040     8
40320    9
362880   10
Good Bye
Press any key to continue_
```

Exercise

- Design the following code using goto and if-else only, i.e., **no while or for loop**

```
#include<stdio.h>
int main(void)
{

int x = 1;
int i = 1;

while (i <= 9) {
    x = x * i;
    i = i + 1;

    printf("%d    %d \n",x, i);
}

printf("Good Bye\n");

return 0;
}
```

```
#include<stdio.h>
int main(void)
{

int x = 1;
int i = 1;

Z:
if (i <= 9) {
    x = x * i;
    i = i + 1;
    printf("%d    %d \n",x, i);
    goto Z;
}

printf("Good Bye\n");

return 0;
}
```

Exercise

- Design the following code using goto and if-else only, i.e., **no while or for loop**

```
1      2
2      3
6      4
24     5
120    6
720    7
5040   8
40320  9
362880 10
Good Bye
Press any key to continue_
```

```
#include<stdio.h>
int main(void)
{

    int x = 1;
    int i = 1;

Z:
    if (i <= 9) {
        x = x * i;
        i = i + 1;
        printf("%d    %d \n",x, i);
        goto Z;
    }
    printf("Good Bye\n");

    return 0;
}
```

Exercise

- What will be the output now ?

```
1      2
Good Bye
Press any key to continue_
```

```
#include<stdio.h>
int main(void)
{

    int x = 1;
    int i = 1;

    if(i <= 9) {
        x = x * i;
        i = i + 1;

        printf("%d    %d \n",x, i);
        goto Z;
    }

Z:
    printf("Good Bye\n");

    return 0;
}
```

Cautions

- Avoid goto as much as possible
 - Reduce Programme readability
 - use COMMENTS, if goto is extremely required
// or //**
 - For the termination you can also use exit() functions which requires a `#include<stdlib.h>`
exit(0) → normal programme terminations

Summary

- It will end our loop lectures.
- There will two labs on it lab 4 and 5.
- However you can't solve any problem in the up-coming labs (Lab 3-11) without loop