In C programming, a **while** loop is a control flow statement that repeatedly executes a block of code as long as a given condition is true. The syntax of a **while** loop is as follows:

while (condition)

{

   // Code to be executed as long as the condition is true

}

Here's a breakdown of the components:

- **while**: The keyword that signifies the beginning of the **while** loop.
- **(condition)**: The condition is a Boolean expression that is evaluated before each iteration of the loop. If the condition is true, the code inside the loop is executed. If the condition is false, the loop is exited, and the program continues with the next statement after the loop.
- **{}**: The curly braces define the scope of the loop. The code inside the curly braces is the block of code that gets executed repeatedly as long as the condition is true.

The general flow of a **while** loop is as follows:

- The condition is evaluated.
- If the condition is true, the code inside the loop is executed.
- The condition is evaluated again.
- Steps 2 and 3 are repeated until the condition becomes false.
- Once the condition is false, the loop is exited, and the program continues with the next statement after the loop.

Example 01: Print Numbers from 1 to 5:

```c
#include <stdio.h>

int main() {

   int i = 1;

   while (i <= 5)

{

      printf("%d ", i);

      i++;

   }

   printf("\n");

return 0;
```

```c
}
```

Example 02 : Calculate the Sum of Numbers from 1 to 5:

```c
#include <stdio.h>

int main() {

    int i = 1;

    int sum = 0;


    while (i <= 5) {

        sum += i;

        i++;

    }


    printf("Sum of numbers from 1 to 5 is %d\n", sum);


    return 0;

}
```

Example 03 : - Print Even Numbers from 2 to 10:

```c
#include <stdio.h>

int main() {

    int num = 2;


    while (num <= 10) {

        printf("%d ", num);

        num += 2;

    }
    printf("\n");

    return 0;
```

```
}
```

Example 04: Guess the Number Game:

```c
#include <stdio.h>

int main() {

    int secretNumber = 7;

    int guess;


    printf("Guess the number (1 to 10): ");


    while (1) {

        scanf("%d", &guess);


        if (guess == secretNumber) {

            printf("Congratulations! You guessed the correct number.\n");

            break;

        } else {

            printf("Incorrect guess. Try again: ");

        }

    }


    return 0;

}
```