

PAPER 102:

PROGRAMMING & PROBLEM SOLVING THROUGH C

Bidur Bhushan Handique
Dept. of Computer Science
St. Anthony's College

THE LOOPS

- Loops helps repeating some portion of the program either a specified number of times or until a particular condition is being satisfied.
- There are 3 kinds of loops:
 - For Loop
 - While Loop
 - Do-While Loop

FOR LOOP

- Popular of all the loops.
- General Form:

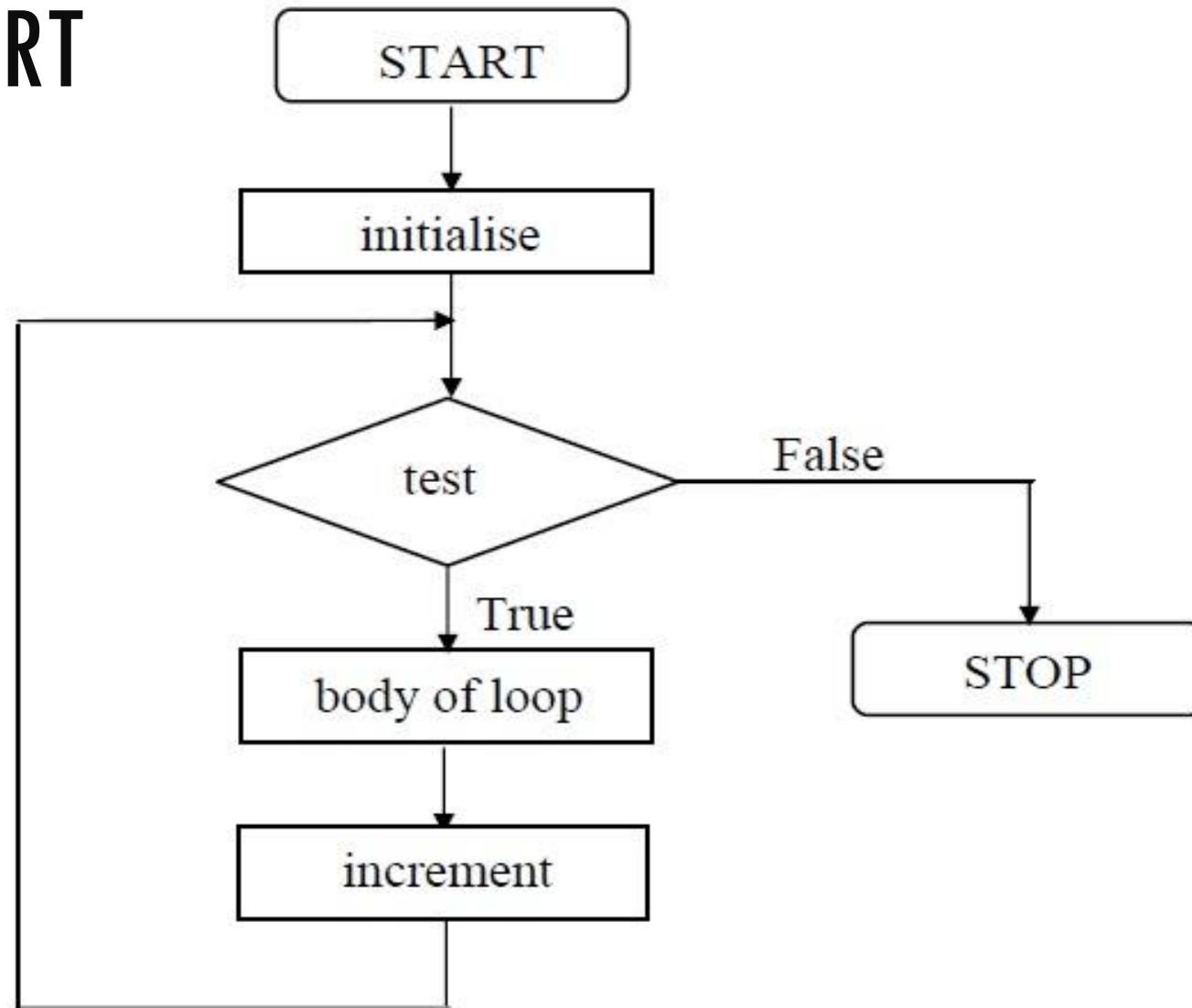
```
for(initialize counter; test counter; increment/decrement counter)
{
    statements;
}
```

CONTINUED

This loop allows to specify three things, that are required in a loop, in a single line:

1. Setting a loop counter to an initial value.
2. Testing the loop counter to determine whether its value has reached the number of repetitions desired.
3. Increment/decrement the counter each time the program segment is executed.

FLOWCHART



EXAMPLE

```
void main()  
{int i,n,square,sum=0;  
n=5;  
for(i=1;i<=n;i++)  
{  
square=i*i;  
printf("The square of %d is %d \n",i,  
square);  
sum=sum + square;  
}  
printf("The sum of all the squares from 1 to  
%d is = %d", n,sum);  
}
```

NESTED FOR LOOP

```
void main()
{
    int i,k;
    for(i=1;i<=3;i++)
    {
        for(k=1;k<=i;k++)
        {
            printf("\n i=%d k=%d",i,k);
        }
    }
}
```

WHILE LOOP

- General Form:

initialize loop counter;

while(condition to test loop counter)

{

statements;

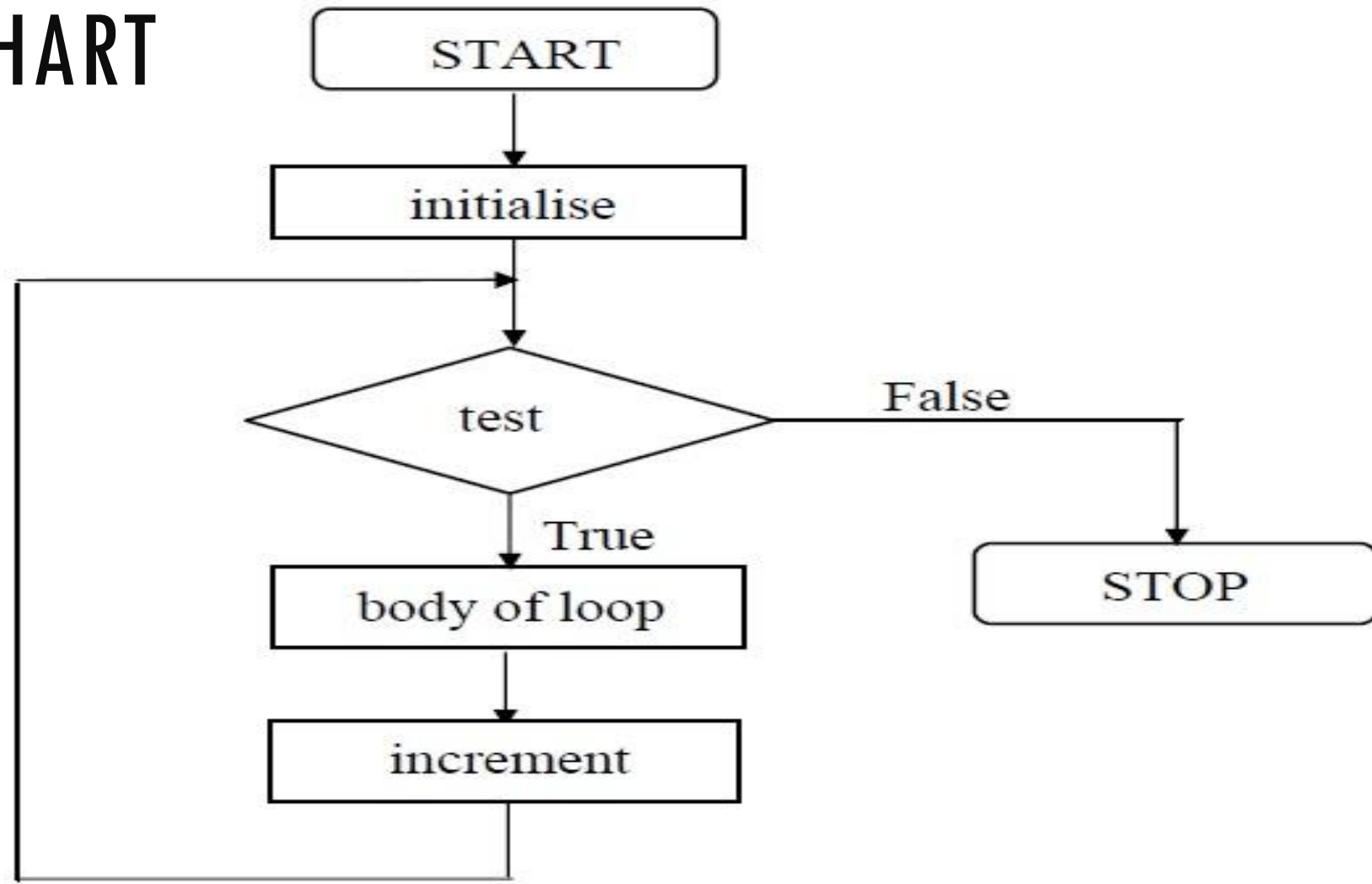
increment/decrement;

}

CONTINUED

- If a single statement is the object of the **while**, the braces may be omitted.
- The loop will repeat as long as the condition is true.
- The while tests its condition at the top of the loops.
- Therefore, if the condition is false to begin with, the loop will not execute at all.
- The condition may be any expression.

FLOWCHART



BREAK AND CONTINUE

BREAK

- Break helps to jump out of a loop instantly.
- And the control is transferred to the statement following the loop.
- it is written as:

`break;`

CONTINUE

- The continue statement is used to bypass the remaining statement after it.
- And the control is transferred to the beginning of the loop.
- it is written as:

`continue;`

EXAMPLE FOR BREAK

```
void main()
{
    int a=1,b=1;
    while(a<=10)
    {
        while(b<=10)
        {
            if (a==b)
                break;

            else
                printf("a=%d b=%d",a,b);
            b++;
        }
        a++;
    }
}
```

EXAMPLE OF CONTINUE

```
void main()                                }    }    }
{ int a,b;
for(a=1;a<=2;a++)
{
    for(b=1;b<=2;b++)
    {
        if (a==b)
            continue;
        printf("a=%d b=%d",a,b);
```

PROGRAMS

- Write a C program to find average of maximum of n positive numbers entered by user. But, if the input is negative, display the average(excluding the average of negative input) and end the program.
- Write a C program to find the product of 4 integers entered by a user. If user enters 0 skip it.
- Write a program to find the factorial value of any number entered through the keyboard.
- Two numbers are entered through the keyboard. Write a program to find the value of one number raised to the power of another.