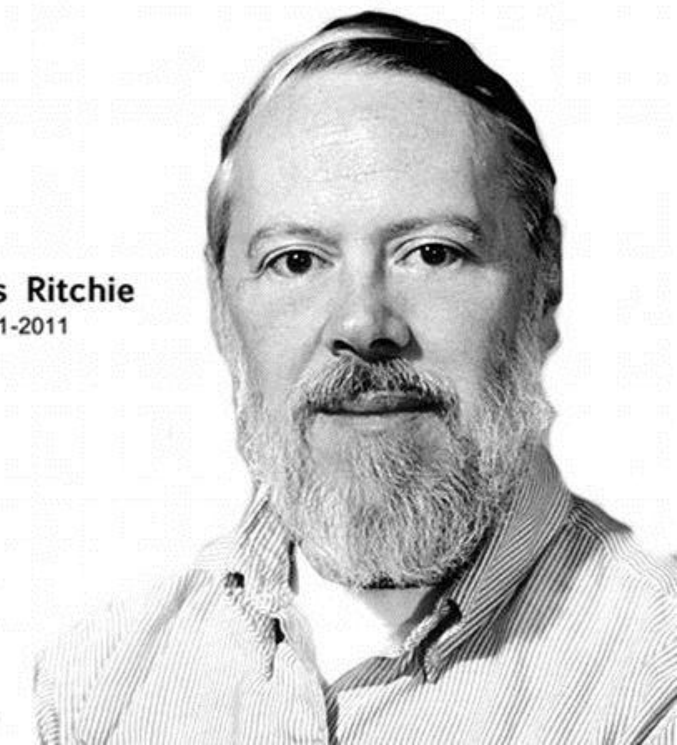
C

THE PROGRAMMING LANGUAGE

History Of C

AT&T Bell Laboratories

- C is a programming language developed at **AT&T Bell Laboratarıes** of **U.S.A.** In **1972.**
- It is designed and written by the scientist **Dennis Ritchie.**
- It is a simple, reliable and easy to use.



Dennis Ritchie
1941-2011

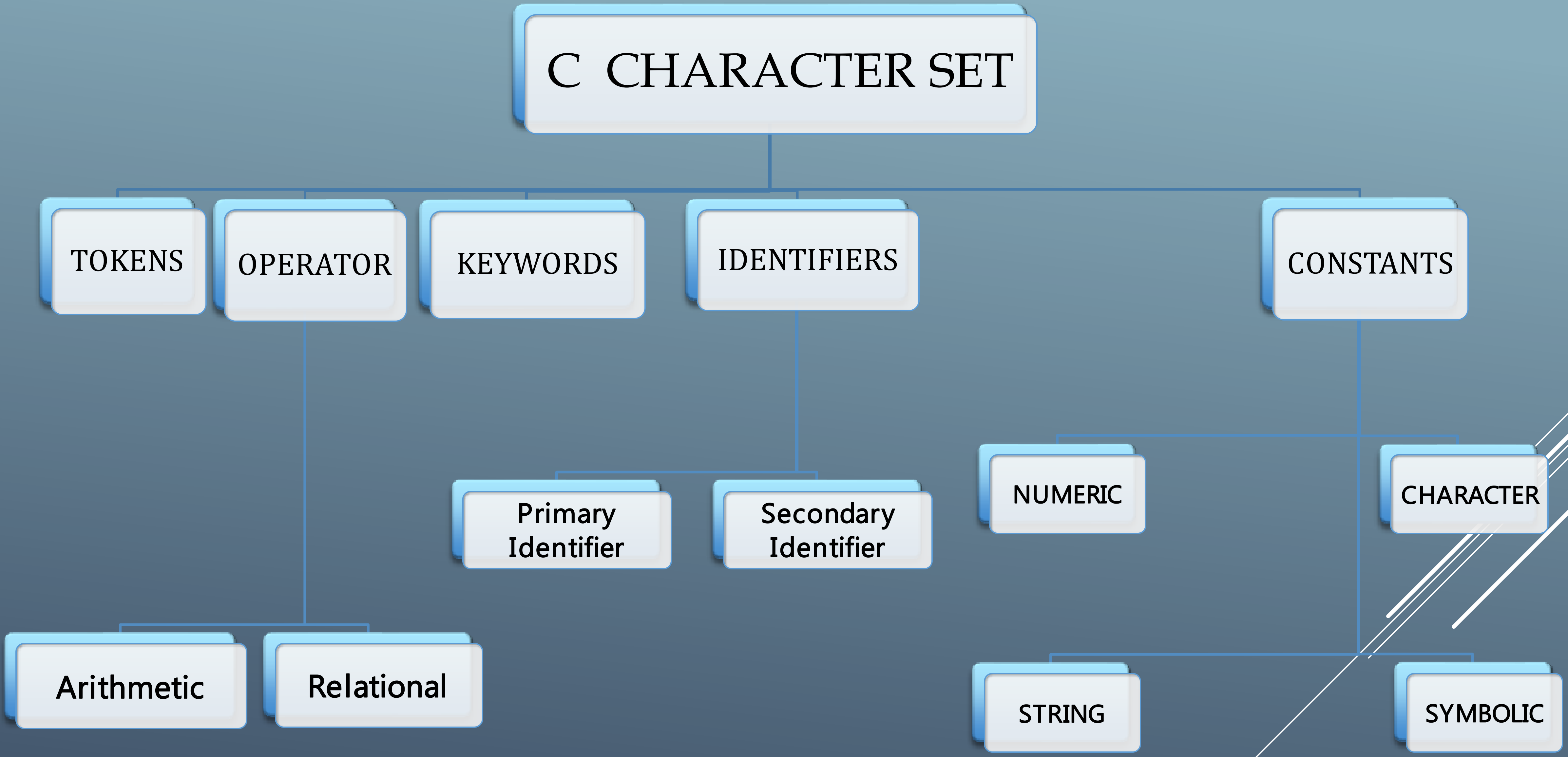
FEATURES OF C Language

- C is a structural programming language.
- C is a middle level programming language.
- It is a general purpose programming language and is useful for writing compilers and operating system.
- In C, there is a simple syntax, portability and powerful features which makes this language a preferred language.
- The C programming language is heavily used in the scientific and high performance computing.

STRUCTURE OF A *C PROGRAM*

```
Documentation Section
Link  Section
Definition Section
Global  Declaration Section
main()
{
Local Declaration Part
Executable part
Calling of user defined function
}
Subprogram function
User defined function1
User defined function2
```

Body Of main() Function



C CHARACTER SET

TOKENS

OPERATOR

KEYWORDS

IDENTIFIERS

CONSTANTS

Primary Identifier

Secondary Identifier

NUMERIC

CHARACTER

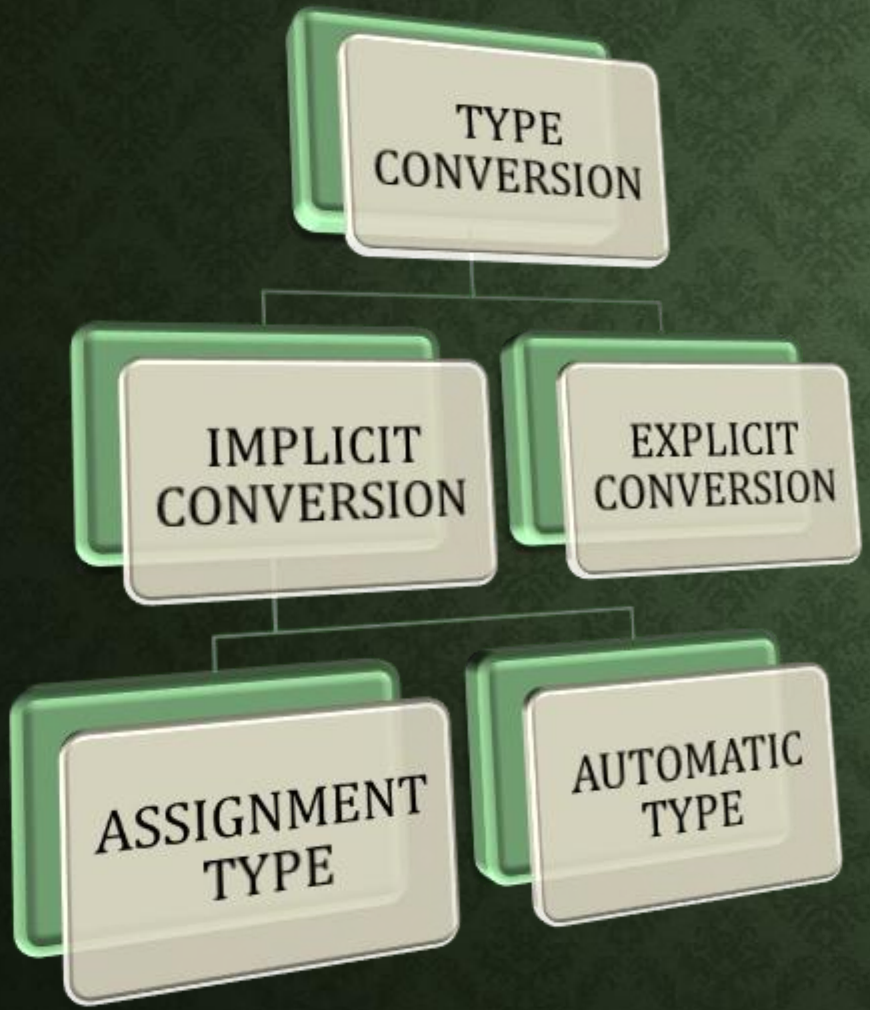
Arithmetic

Relational

STRING

SYMBOLIC

Type Conversion



C provides the facility of mixing various types of variables and constants in an expression.
In operators, the data type of one operand is converted into data type of another operand. This is known as type conversion.

There are two types of conversion:

- Implicit Type Conversion
- Explicit Type Conversion

LOOPS IN ‘C’

To perform a set of instructions rapidly until a particular condition is satisfied is known as Looping. This repetitive operation is also known as iteration and is done through loop control instructions which are ‘for’, ‘while’ and ‘do while’.

SYNTAX:

For Loop:

```
for(initialization;conditions;counter)
```

while loop:

```
Initail loop counter;
while(condition)
{
statements;
updation of a counter
variable;
}
```

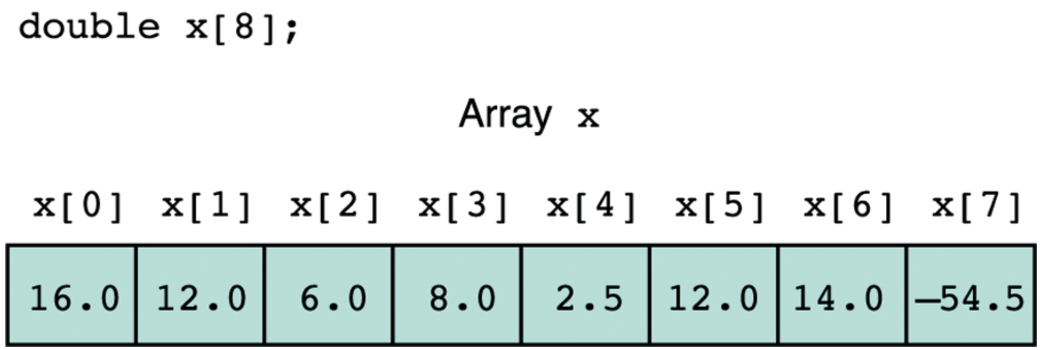
do while loop:

```
Initialisation of
counter;
do
{
Statements;
Updation of counter
variable;
}while(condition);
```

ARRAY

SUBSCRIPTED VARIABLE

An array is said to be a collection of similar types of data items and each data items is called an element of an array.



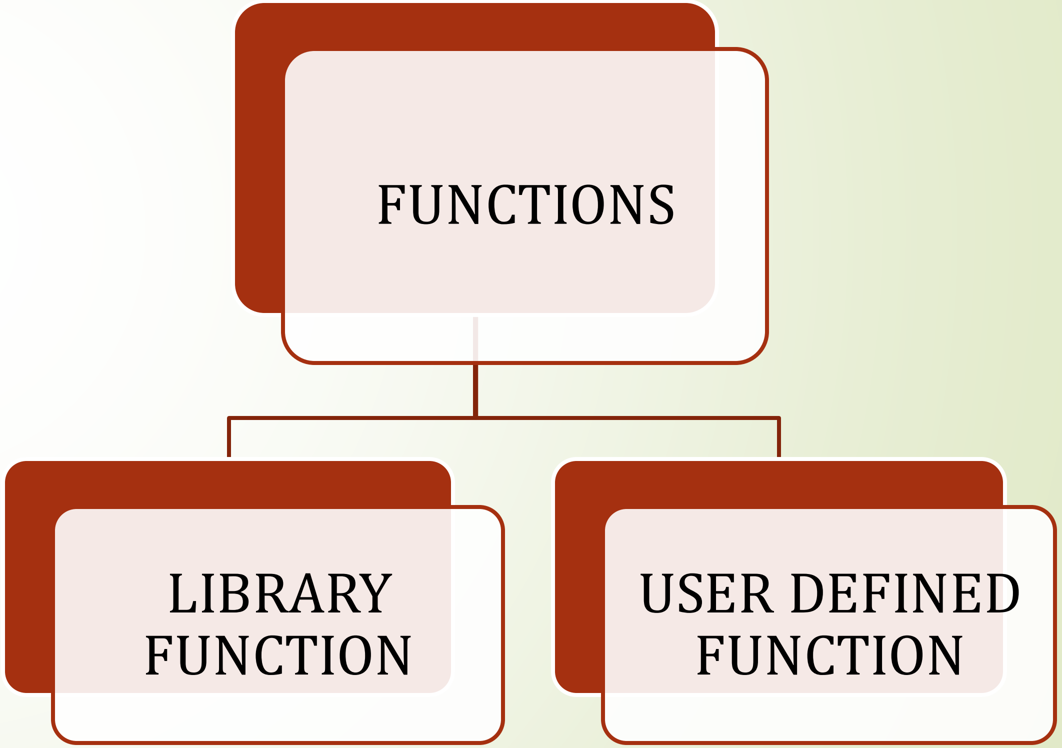
```
double x[8];
```

Array x

x[0]	x[1]	x[2]	x[3]	x[4]	x[5]	x[6]	x[7]
16.0	12.0	6.0	8.0	2.5	12.0	14.0	–54.5

Functions

A function is a **block of statements**, which is used to perform a specific task.

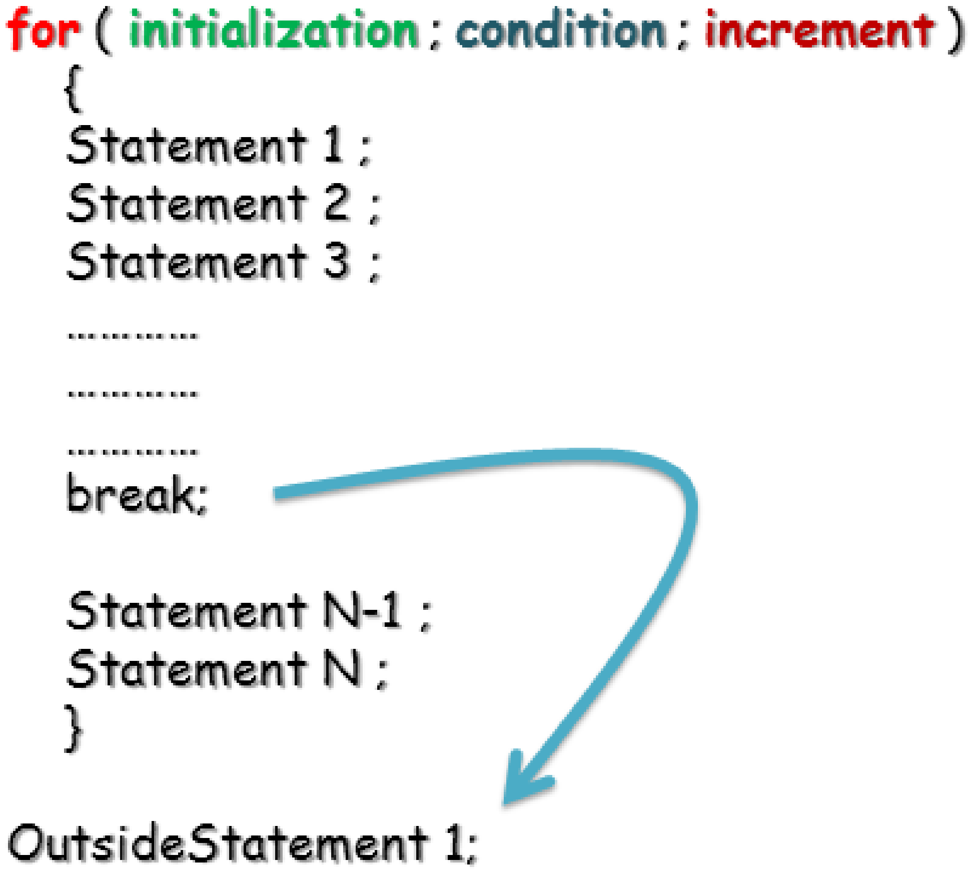


BREAK

STATEMENT

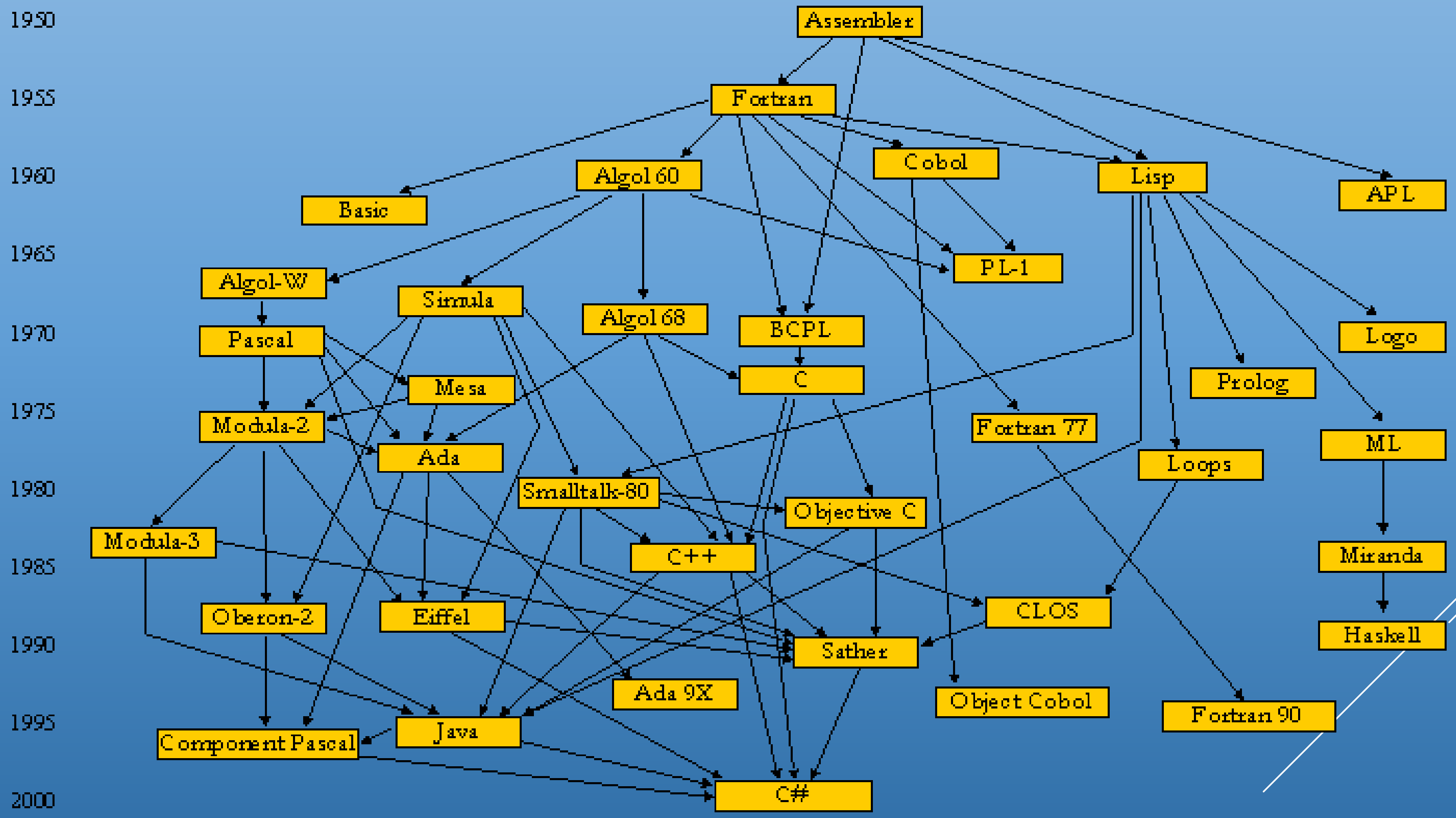
#include<stdio.h>

When break statement is encountered inside a block, it skips all the statements witten after the break in that particular block and passes the control to the first statement written after that block.



```
for ( initialization ; condition ; increment )
    {
    Statement 1 ;
    Statement 2 ;
    Statement 3 ;

    ………..

    ………..

    ………..
    break;

    Statement N-1 ;
    Statement N ;
    }

OutsideStatement 1;
```

PROGRAMMING LANGUAGE FAMILY TREE



(C) Fachhochschule Aargau für
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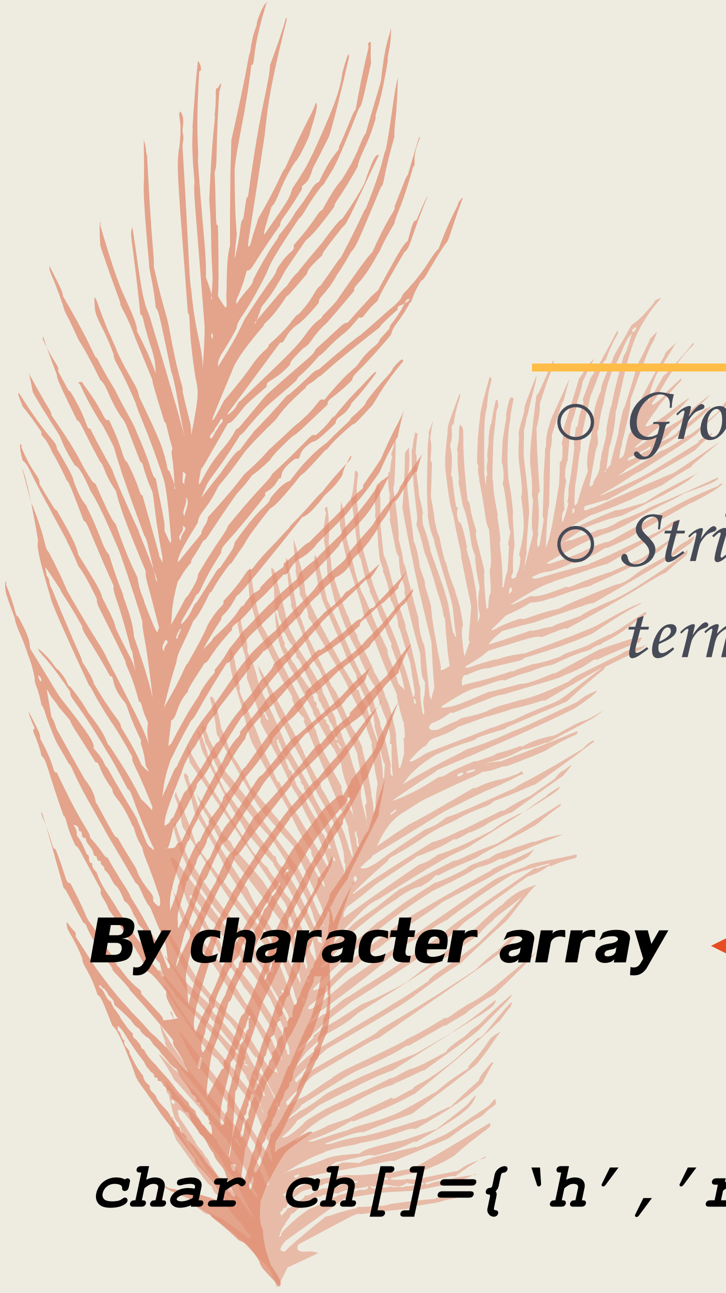
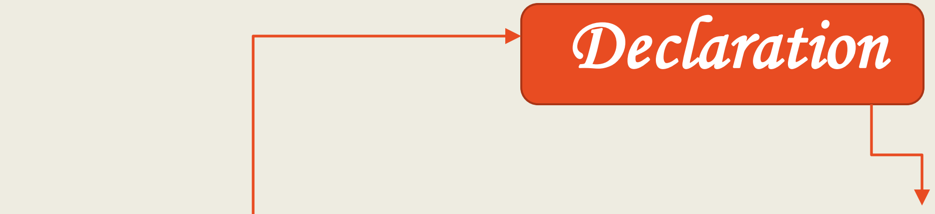
Strings In “C”



○ *Group of characters can be stored in a character array.*

○ *String in C language is an array of characters that is terminated by’\0 ‘(null character).*



Declaration

By character array

```
char ch[]={‘h’,’r’,’f’};
```

By string literal

```
char ch[]=“hello”;
```

SAMPLE PROGRAM

```
#include<stdio.h>
int main() {
int  a,b,c;
printf(“Enter the three numbers:\n”);
scanf(“%d%d%d”,&a,&b,&c);
if(a<b) {
if(b<c)
printf(“largest number is: %d”, c);
}
else if(b>c) {
printf(“largest number is: %d”, b);
}
printf(“largest number is: %d” , a);
}
```

OUTPUT

```
Enter the three numbers: 5
45
32
largest number is: 45
```

PREPROCESSOR DIRECTIVES

- *Preprocessors directives are actually the instructions to the compiler itself.*
- *The most common preproceesor directives are:*

- *include directive*
- *define directive*

- *include directive:*

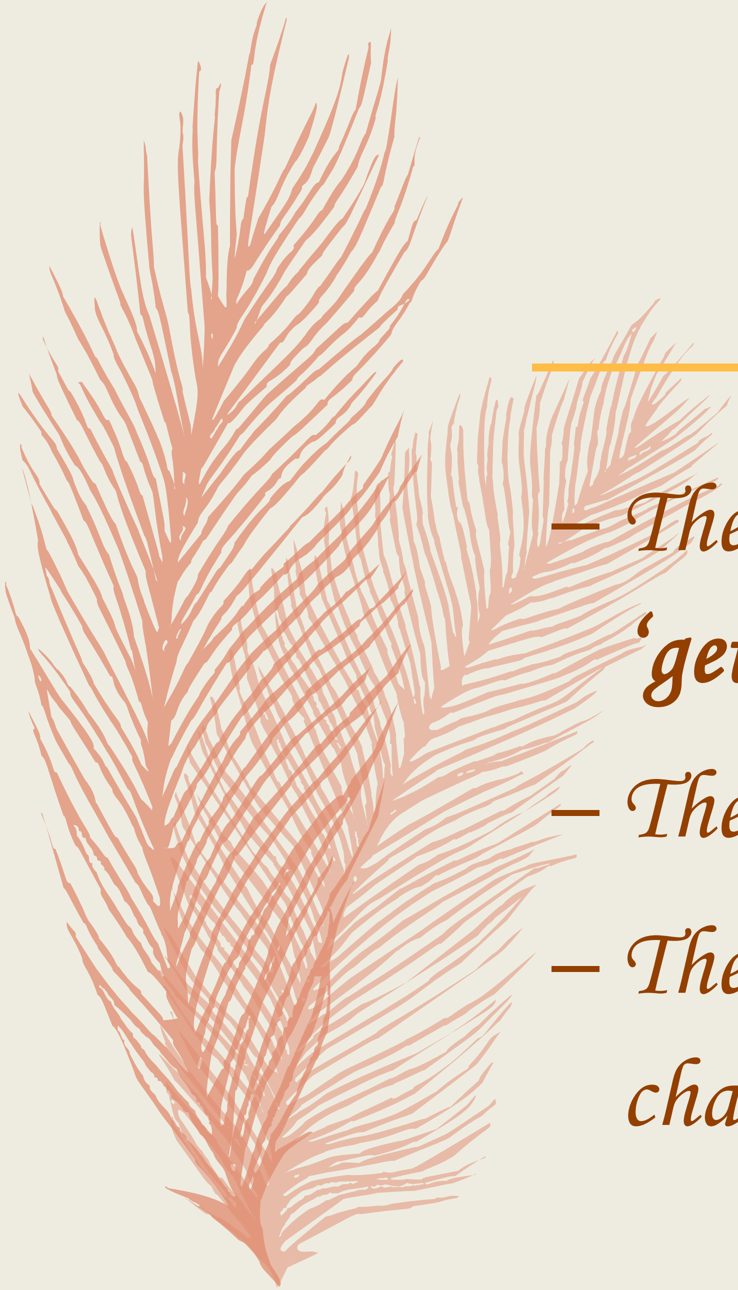
Include directive is used to include files. Example:

#include<stdio.h>

- *define directive:*

It is used to assign names to different constants or statements which are to be used repeatedly in a program. These defined values or statements can be used by main or in the user defined functions as well.

INPUT/OUTPUT IN ‘C’



- *The basic* ***input/output*** *function are* ***‘getchar’, ‘gets’, ‘puts’, ‘scanf’ and ‘printf’.***
- *The getchar function returns a single character.*
- *The putchar function displays the single characters.*