Lecture 10:
C Programming Language

Dept. of CSE, ULAB

C is Case Sensitive

- In **C** most keywords are in lower case.
- Compiler shows syntax error if we use in another case.
- **Example 1:**

```
int age;
int Age;
```

The compiler treats age and Age as two different variable.

- **Example 2:**

```
int age;
INT Age;
```

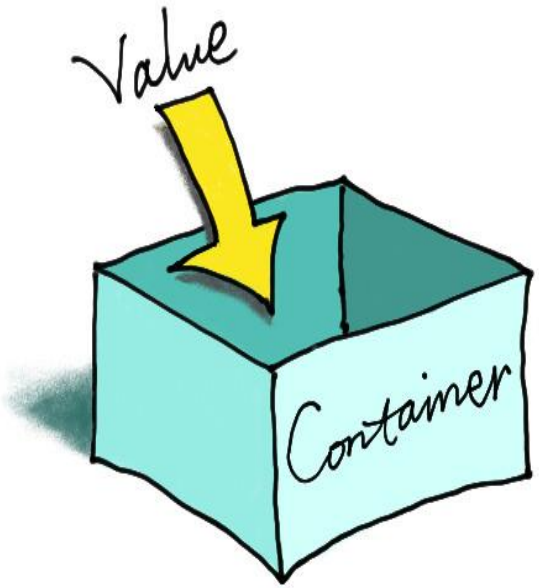
The second line in the program will throw an error because we have written the int datatype in capital case, whereas C only understands the int datatype written in small case.

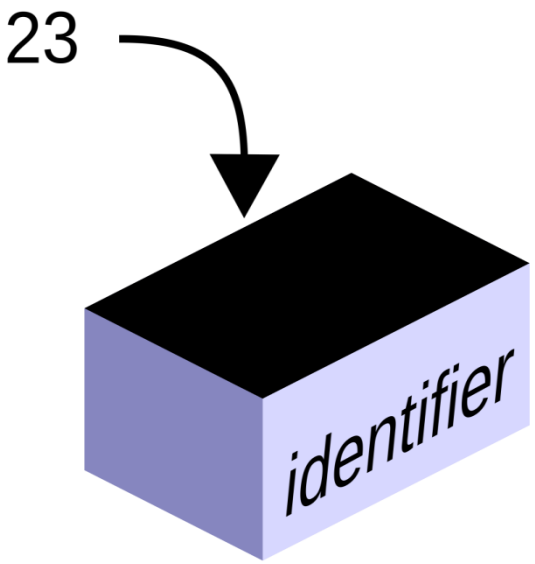
Keywords

- Keyword is a predefined or reserved word in C library with a fixed meaning
- Every Keyword exists in lower case latter like auto, break, case, const, continue, **int, float, if, else, for, while** etc.

Keyword List			
auto	double	int	struct
break	else	long	switch
case	enum	register	typedef
char	extern	return	union
const	float	short	unsigned
continue	for	signed	void
default	goto	sizeof	volatile
do	if	static	while

Variables





Variables

- **Variable** is an identifier which holds data or another one variable.
- It is an identifier whose value can be changed at the execution time of program.
- It is used to identify input data in a program.

Rules to declare a Variable

- **Characters Allowed :**
  - Underscore(_)
  - Capital Letters (A – Z)
  - Small Letters (a – z)
  - Digits (0 – 9)
- **Blanks & Commas** are not allowed
- No Special Symbols other than **underscore(_) are allowed**
- **First Character** should be **alphabet or Underscore**
- Variable name Should not be **Reserved Word**
- No spaces are allowed in variable declaration.

Variables Types

- **Two types of variables:**
  - Local variable
  - Global variable

- **Global Variables**
  - These variables are declared outside all functions.
  - Can be accessed by any function.

- **Local Variables**
  - These variables are declared inside some functions.
  - Can be accessed only in that function

```
/* Compute Area and Perimeter of
   a circle */
#include <stdio.h>
float pi = 3.14159;  /* Global */

int main() {
  float area;   /* Local */
  int rad = 5;
  area = pi * rad * rad;
  printf("%f", area);

return 0;
}
```

Basic Data Types

- There are four data types in C language.

Types	Data Types
Basic data types	**int, char, float, double**
User Defined Data Types	Structure, union, enum
Derived data type	pointer, array, structure, union
Void data type	void

Data Type Format Specifiers

%d - int (same as %i)

%f - float

%c - char

%s - string

%lf - double

```
/* Compute Area and Perimeter of
   a circle */
#include <stdio.h>

int main()
{
  float pi = 3.14159;
  float area;
  int rad = 5;
  area = pi * rad * rad;
  printf("%f", area);

  return 0;
}
```

Take Input using scanf() and printf() Functions

- **printf()** displays the output on screen
- **scanf()** reads the input and stores them in a variable

```
#include <stdio.h>
int main( )
 {
   char str[100];
   printf( "Enter a value in word: ");
   scanf("%s", str);
   printf( "\nYou entered: %s ", str);
   return 0;
}
```

Output

```
Enter a value in word: seven
You entered: seven
```

```
#include <stdio.h>
int main()
{
    int num;
    printf("Enter an integer value: ");
    scanf("%d", &num);
    printf("You entered: %d", num);
    return 0;
}
```

Output

```
Enter an integer value:  7
You entered: 7
```

STATEMENT

Types of Statement : There are three types of statement in C.

1. **Expression Statement:** The simplest kind of statement in C is an expression (followed by a semicolon, the terminator for all simple statements).

   Examples: a=3; c= a+b; printf("area= %f", area); etc

2. **Compound Statement:** A compound statement consists of several individual statements enclosed within a pair of braces { }.

Examples:

```
if (radius > 0)
{
        float pi = 3.1416;
        circumference =  2 * pi * radius;
        Area = pi * radius * radius;
}
```

STATEMENT

3. Control Statement: A control statement are used to create special program features, such as logical tests, loops, and branches.

Examples:

```
while(count<= n )
  {
        printf(“x=“);
        scanf(“%f”, &x);
        sum += x;
        ++count;
  }
```

Library Function in C

- C Standard library functions are inbuilt functions in C programming.
- Functions are present in their respective header files, and must be included in your program to access them.

stdio.h: I/O functions: **getchar()** returns the next character typed on the keyboard. **putchar()** outputs a single character to the screen. **printf()** **scanf()**	**string.h: String functions** **strcat()** concatenates a copy of str2 to str1 **strcmp()** compares two strings **strcpy()** copies contents of str2 to str1
math.h: Mathematics functions: acos() returns arc cosine of arg asin() returns arc sine of arg atan() returns arc tangent of arg cos() returns cosine of arg exp() returns natural logarithim e fabs() returns absolute value of num sqrt() returns square root of num	**ctype.h: Character functions** **isdigit()** returns non-0 if arg is digit 0 to 9 **isalpha()** returns non-0 if arg is a letter of the alphabet **isalnum()** returns non-0 if arg is a letter or digit **islower()** returns non-0 if arg is lowercase letter **isupper)** returns non-0 if arg is uppercase letter
time.h: Time and Date functions **time()** returns current calender time of system **difftime()** returns difference in secs between two times	**stdlib.h:Miscellaneous functions** **malloc()** provides dynamic memory allocation, covered in future sections **rand()** for random function generate

Thank You