IMT SCHOOL

# C Programming

## Lecture Two

## Conditional Statements in C

# Remember C Operators

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Arithmetic | Uni | ++ | -- | | | | |
| | Bi | + | - | * | / | % | |
| Bit wise | & | \| | ~ | ^ | >> | << | |
| Assignment | = | += | -= | *= | /= | %= | += |
| | &= | \|= | ^= | >>= | <<= | | |
| Relational | > | < | >= | <= | == | != | |
| Logical | && | \| \| | ! | | | | |
| Other | Size of operator | sizeof() | | | | | |
| | Ternary operator | ? : ; | | | | | |
| | Address operator | & | ( will be discussed later ) | | | | |
| | Dereference | * | ( will be discussed later ) | | | | |
| | Subscriptor | [ ] | ( will be discussed later ) | | | | |

# True and false in c

## True

✓

Any number not equals to zero

*1 is true*
*1000 is true*
*-4 is true*
*Any number except 0 is true*

## False

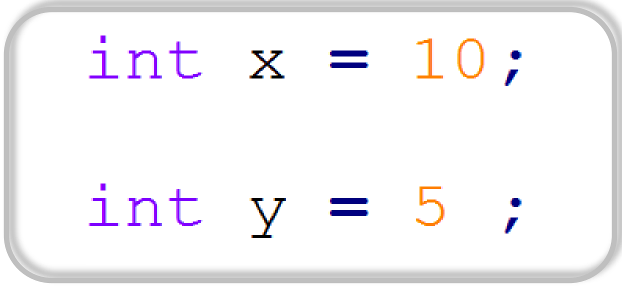
✗

0

***Note***, if there is a statement in c that returns true, the compiler is free to choose the value of the true with the rule that it must be any number except 0.

# Relational Operators in C

This operators are used to check the relation between new values and return either true or false.



```c
int x = 10;

int y = 5 ;
```

**1- <u>Check Equality</u>**

*example*

```c
x == y  /* checks if x equals to y
           this statement will return false */
```

**2- <u>Check Not Equality</u>**

*example*

```c
x != y  /* checks if x is not equal to y
           this statement will return true  */
```

**3- <u>Check More Than</u>**

*example*

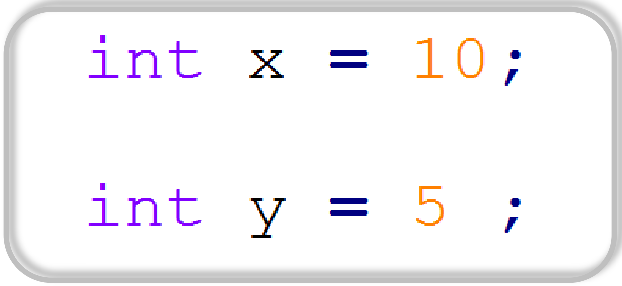
```c
x >  y  /* check if x is more than y
           this statement will return true  */
```

**4- <u>Check More Than or equal</u>**

*example*

```c
x >= y  /* check if x is more than or equals to y
           this statement will return true  */
```

# Relational Operators in C

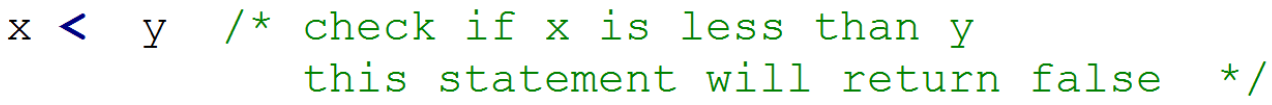


```
int x = 10;

int y = 5 ;
```

This operators are used to check the relation between new values and return either true or false.

## 5- Check Less Than

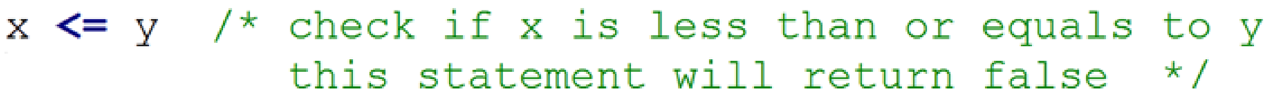
*example*



```
x <  y  /* check if x is less than y
           this statement will return false  */
```

## 6- Check Less Than or equal

*example*



```
x <= y  /* check if x is less than or equals to y
           this statement will return false  */
```

***Note***, if you tried to print false value, the value that will be printed is 0

***Note***, if you tried to print true value, the value that will be printed is not zero and chosen by the compiler, in most cases it will be 1 or 255

# Logical Operators in C

These operators are used to apply logical operation between two values, each value will be considered either false if it is 0 or true if it is not 0.

## 1- Logical And

*example*

```
int x = 3 && 0; /* 3 is true and 0 is false
                   true AND false is false
                   then x now equals 0 */
```

## 2- Logical OR

*example*

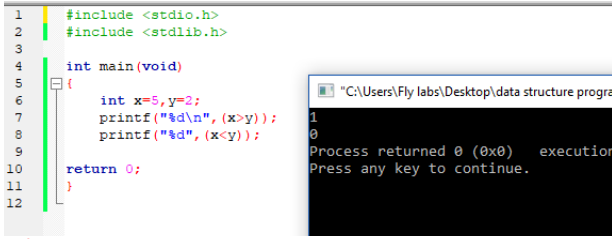
```
int x = 3 || 0; /* 3 is true and 0 is false
                   true OR false is true
                   if the compiler consider true is 255
                   then x now equals 255          */
```

## 3- Logical Not

*example*

```
int x = !5 ;     /* 5 is true
                    NOT true is false
                    then x now equals 0 */
```

# LAB 1

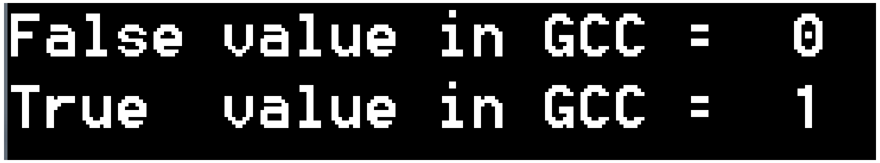


```c
#include <stdio.h>
#include <stdlib.h>

int main(void)
{
    int x=5,y=2;
    printf("%d\n",(x>y));
    printf("%d",(x<y));

return 0;
}
```

"C:\Users\Fly labs\Desktop\data structure progra

```
1
0
Process returned 0 (0x0)   executior
Press any key to continue.
```

## Expected Output



```
False value in GCC =  0
True  value in GCC =  1
```

Write a C code to print the false value and the true value on GCC.

# Time To Code

# Conditional Statements in C

***Conditional statements are used to execute some code under certain conditions.***

***C defines 2 different conditional statements.***

***1- if Statement***

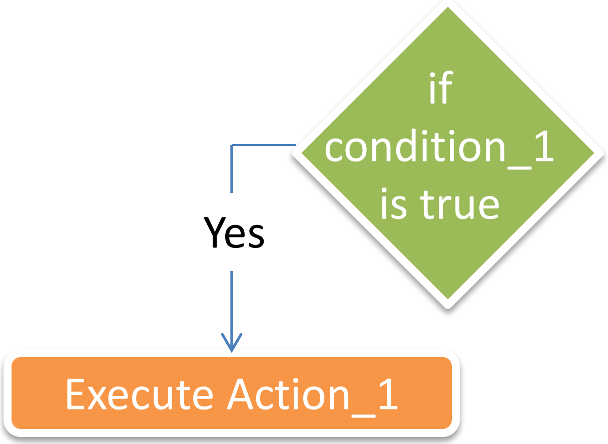
***2- switch Statement***

# If statement in C

**Case_1 : Only if condition**

## Syntax

```
if ( condition_1 )
{
     Action_1
}
```

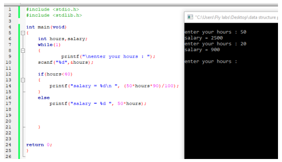


if condition_1 is true

Yes

Execute Action_1

# LAB 2



```c
#include <stdio.h>
#include <stdlib.h>

int main(void)
{
    int hours,salary;
    while(1)
    {
            printf("\nenter your hours : ");
    scanf("%d",&hours);

    if(hours<40)
    {
        printf("salary = %d\n ", (50*hours*90)/100);
    }
    else
        printf("salary = %d ", 50*hours);



    }


return 0;
}
```

"C:\Users\Fly labs\Desktop\data structure

```
enter your hours : 50
salary = 2500
enter your hours : 20
salary = 900

enter your hours :
```

Write a C code to calculate employee salary in a week based on the his working hours, hour rate is 50.

The program will ask the user to enter the working hours, then it will print his salary.
But if the working hours are less than 40 hours, a 10% deduction will be applied.

## Expected Output

```
Plese Enter Your working hours: 50
Your Salary is 2500
```

```
Plese Enter Your working hours: 20
Your Salary is 900
```

## Time To Code

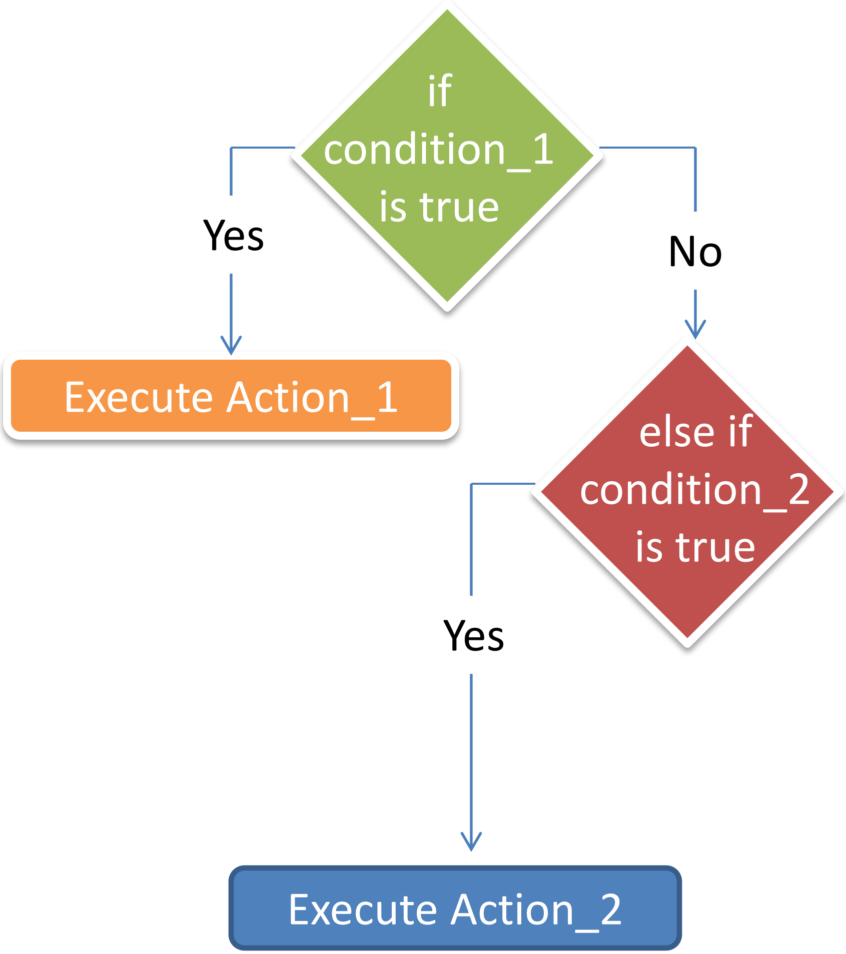
# If statement in C

**_Case_2 : if, else if statement_**

**_Syntax_**

```
if ( condition_1 )
{
    Action_1
}
```

```
else if ( condition_2 )
{
    Action_2
}
```



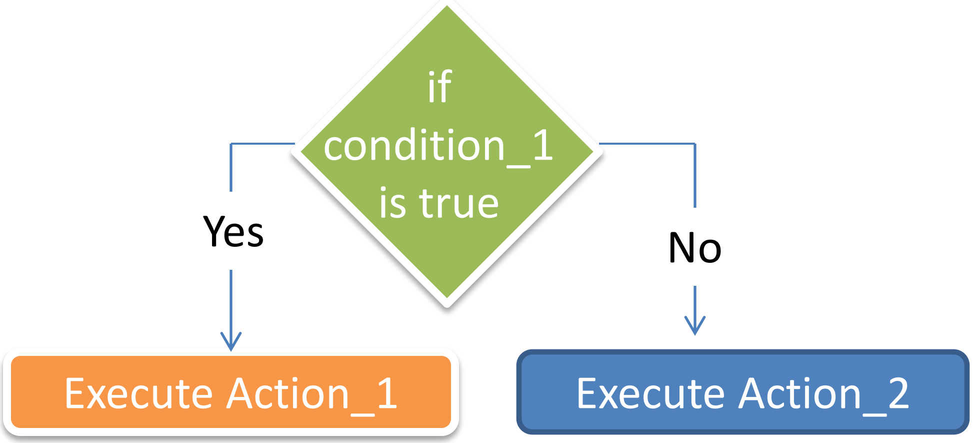
# If statement in C

**_Case_3 : if, else statement_**

## Syntax

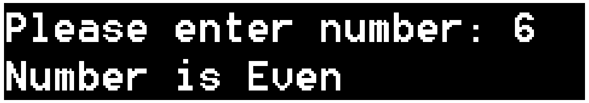
```
if ( condition )
{
    Action_1
}
```

```
else
{
    Action_2
}
```

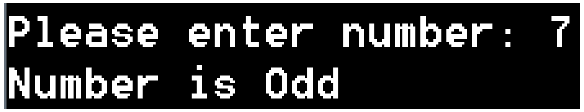


# LAB 3

## Expected Output

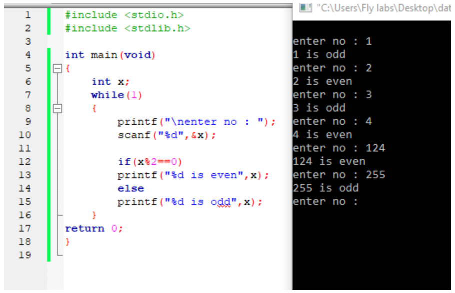


```
Please enter number: 6
Number is Even
```



```
Please enter number: 7
Number is Odd
```

Write a C code that ask the user to enter a number and check if it is Even or Odd number



```c
#include <stdio.h>
#include <stdlib.h>

int main(void)
{
    int x;
    while(1)
    {
        printf("\nenter no : ");
        scanf("%d",&x);

        if(x%2==0)
        printf("%d is even",x);
        else
        printf("%d is odd",x);
    }
return 0;
}
```

"C:\Users\Fly labs\Desktop\dat

```
enter no : 1
1 is odd
enter no : 2
2 is even
enter no : 3
3 is odd
enter no : 4
4 is even
enter no : 124
124 is even
enter no : 255
255 is odd
enter no :
```

**Time To Code**

# If statement in C

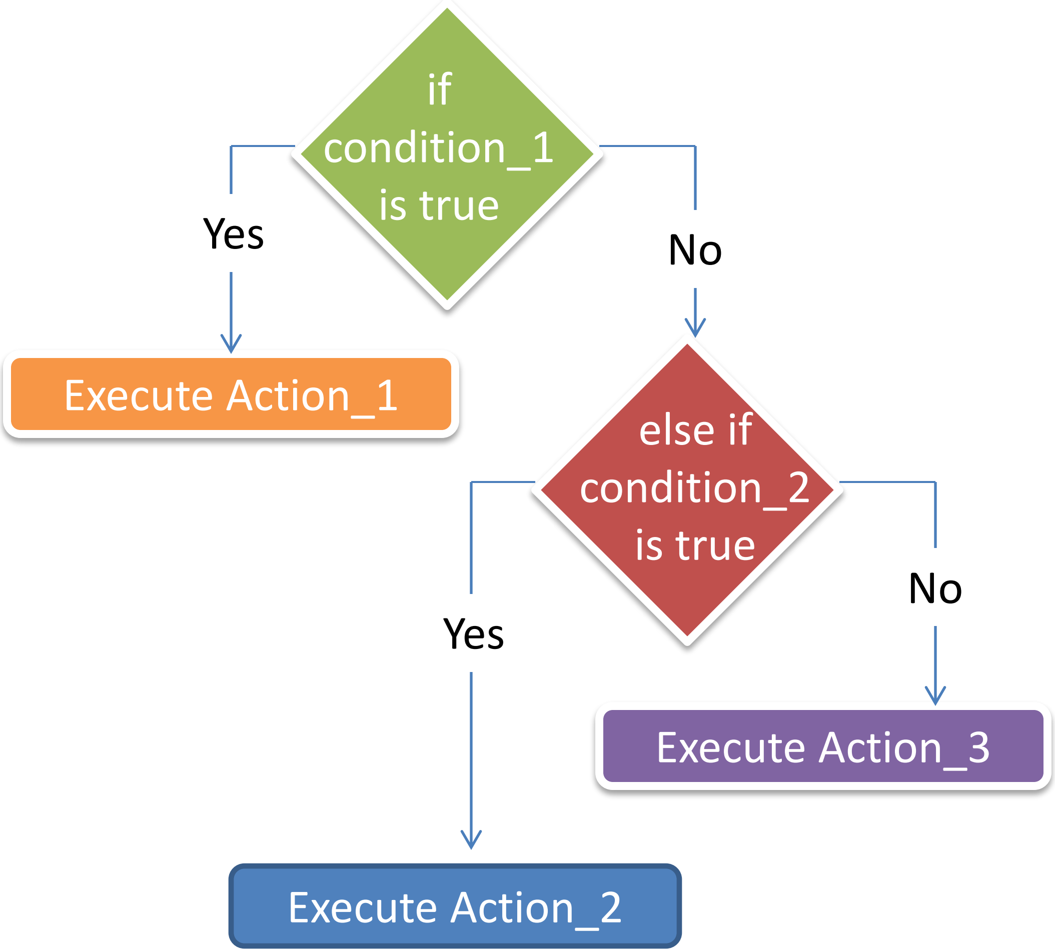
**_Case_4 : if, else if , else condition_**

## Syntax

```
if ( condition_1 )
{
    Action_1
}
```

```
else if ( condition_2)
{
    Action_2
}
```

```
else
{
    Action_3
}
```



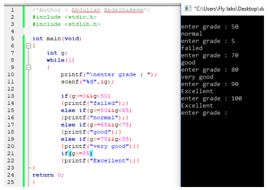
# LAB 4

Write a C code to ask the user to enter his grade and the program will print his rating.

0 <= grade < 50 ------> Failed
50 <= grade < 65 ------> Normal
65 <= grade < 75 ------> Good
75 <= grade < 85 ------> Very Good
85 <= grade ------> Excellent

**Time To Code**

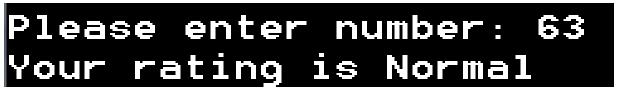
Expected Output



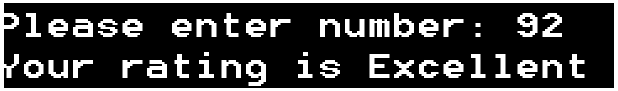
```c
/*Author : Abdullah Abdelhakeem*/
#include <stdio.h>
#include <stdlib.h>

int main(void)
{
    int g;
    while(1)
    {
        printf("\nenter grade : ");
        scanf("%d",&g);

        if(g>=0&&g<50)
        {printf("failed");}
        else if(g>=50&&g<65)
        {printf("normal");}
        else if(g>=65&&g<75)
        {printf("good");}
        else if(g>=75&&g<85)
        {printf("very good");}
        if(g>=85)
        {printf("Excellent");}
}
return 0;
}
```

"C:\Users\Fly labs\Desktop\da

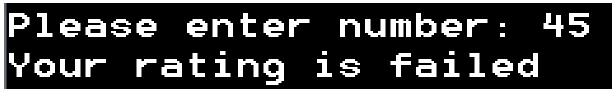
```
enter grade : 50
normal
enter grade : 5
failed
enter grade : 70
good
enter grade : 80
very good
enter grade : 90
Excellent
enter grade : 100
Excellent
enter grade :
```



```
Please enter number: 63
Your rating is Normal
```



```
Please enter number: 92
Your rating is Excellent
```



```
Please enter number: 45
Your rating is failed
```

# If statement in C

***General Rules:***

1- ***else if*** statement is optional, you may have no else if, you may have one, you may have more, no limit.

2- ***else*** statement is optional, you can have only one else statement.

3- No code is allowed to be written between if and else if or else.

4- Nested if is allowed.

5- if the condition in if statement is a combination between many conditions, use round brackets ( ) with each condition to avoid precedence issues.

6- In case of only one action only should be taken in if statement, you may not use { }, but it is always preferred to use { } even if only one action is required.

# Question 1

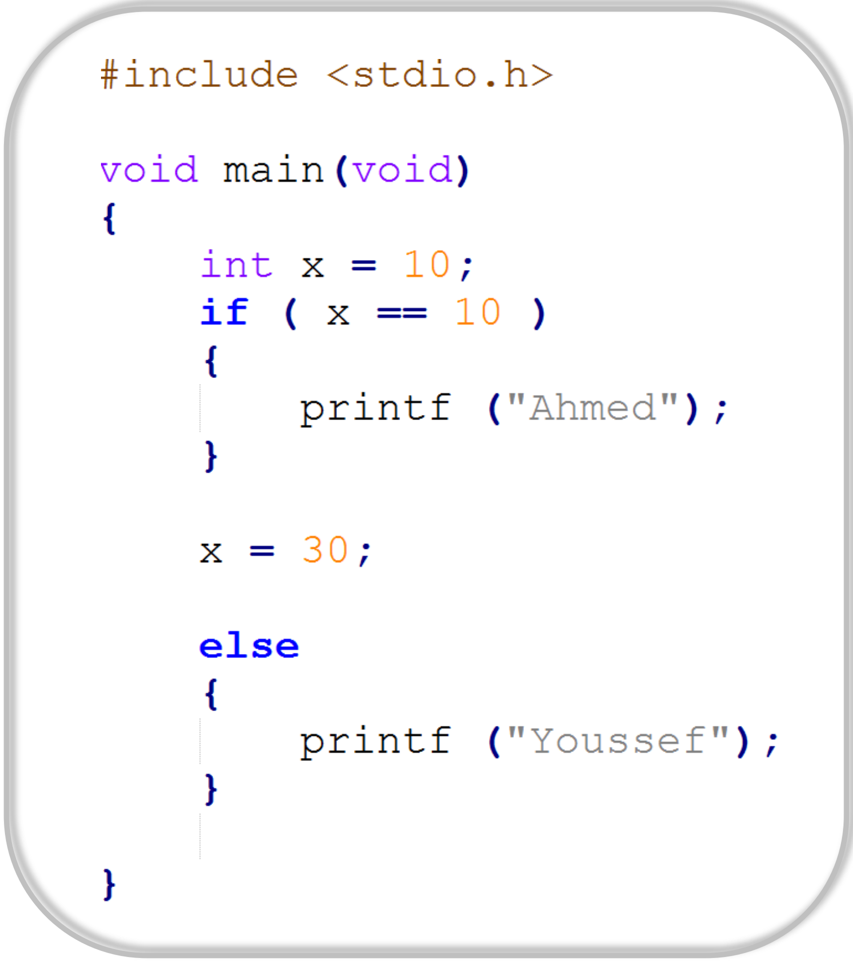
What will be the output of the following code … ?

a- Ahmed

b- Youssef

c- compilation error

d- 30



```
#include <stdio.h>

void main(void)
{
	int x = 10;
	if ( x == 10 )
	{
		printf ("Ahmed");
	}

	x = 30;

	else
	{
		printf ("Youssef");
	}

}
```

# Question 1

What will be the output of the following code … ?

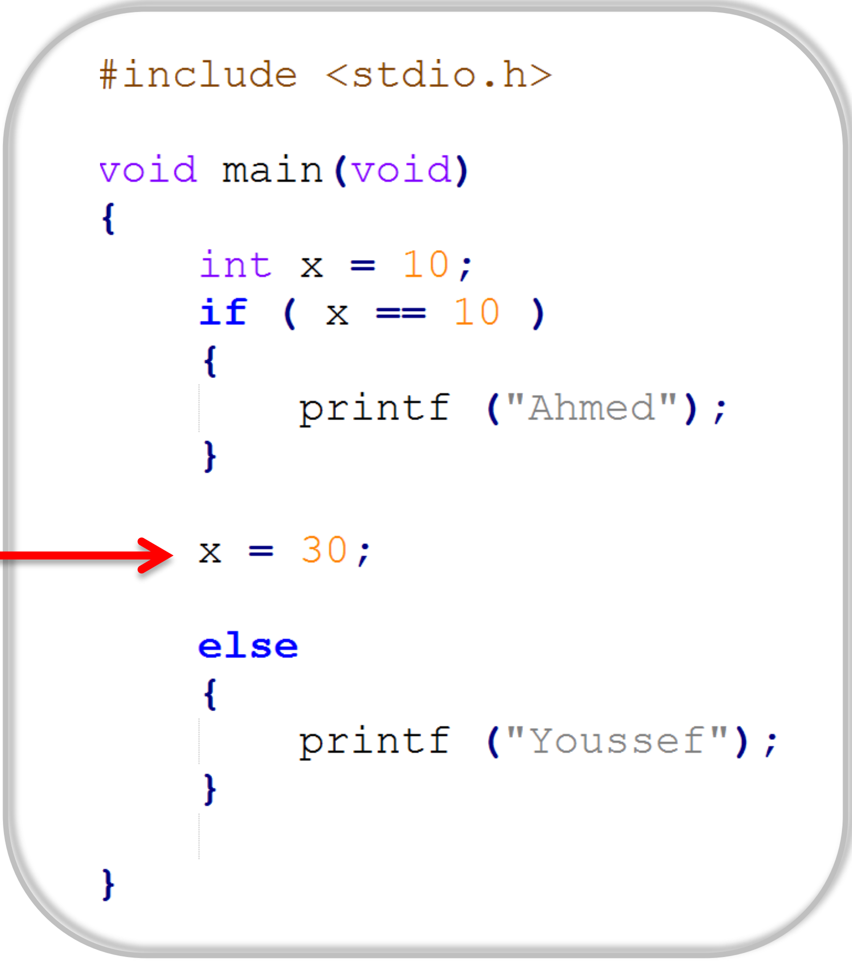
a- Ahmed

b- Youssef

[✓ c- compilation error]

d- 30

***Reason:***
No code is allowed between if and else



```
#include <stdio.h>

void main(void)
{
        int x = 10;
        if ( x == 10 )
        {
                printf ("Ahmed");
        }

        x = 30;

        else
        {
                printf ("Youssef");
        }

}
```

# Question 2

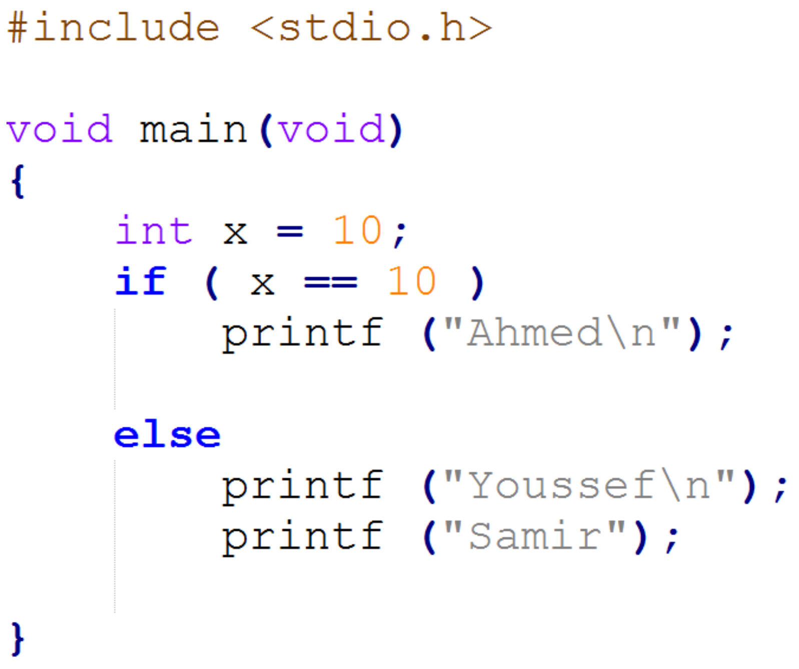
What will be the output of the following code … ?

a- Ahmed

b- Youssef

c- compilation error

d- Ahmed
Samir



```
#include <stdio.h>

void main(void)
{
    int x = 10;
    if ( x == 10 )
        printf ("Ahmed\n");

    else
        printf ("Youssef\n");
        printf ("Samir");

}
```

# Question 2

What will be the output of the following code … ?

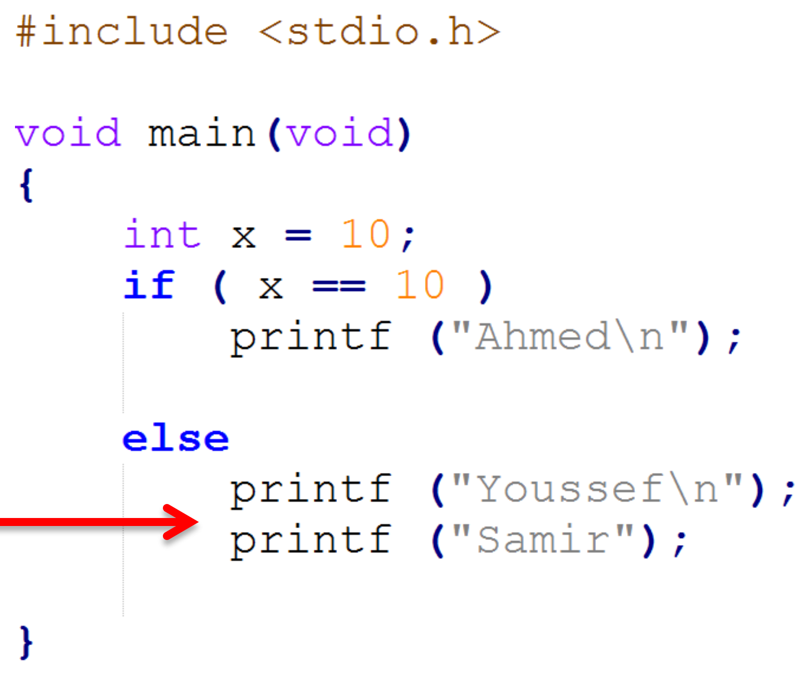
a- Ahmed

b- Youssef

c- compilation error

[✓ d- Ahmed
Samir]

***Reason:***
No { } with else statement, then only one statement is corresponding to else.



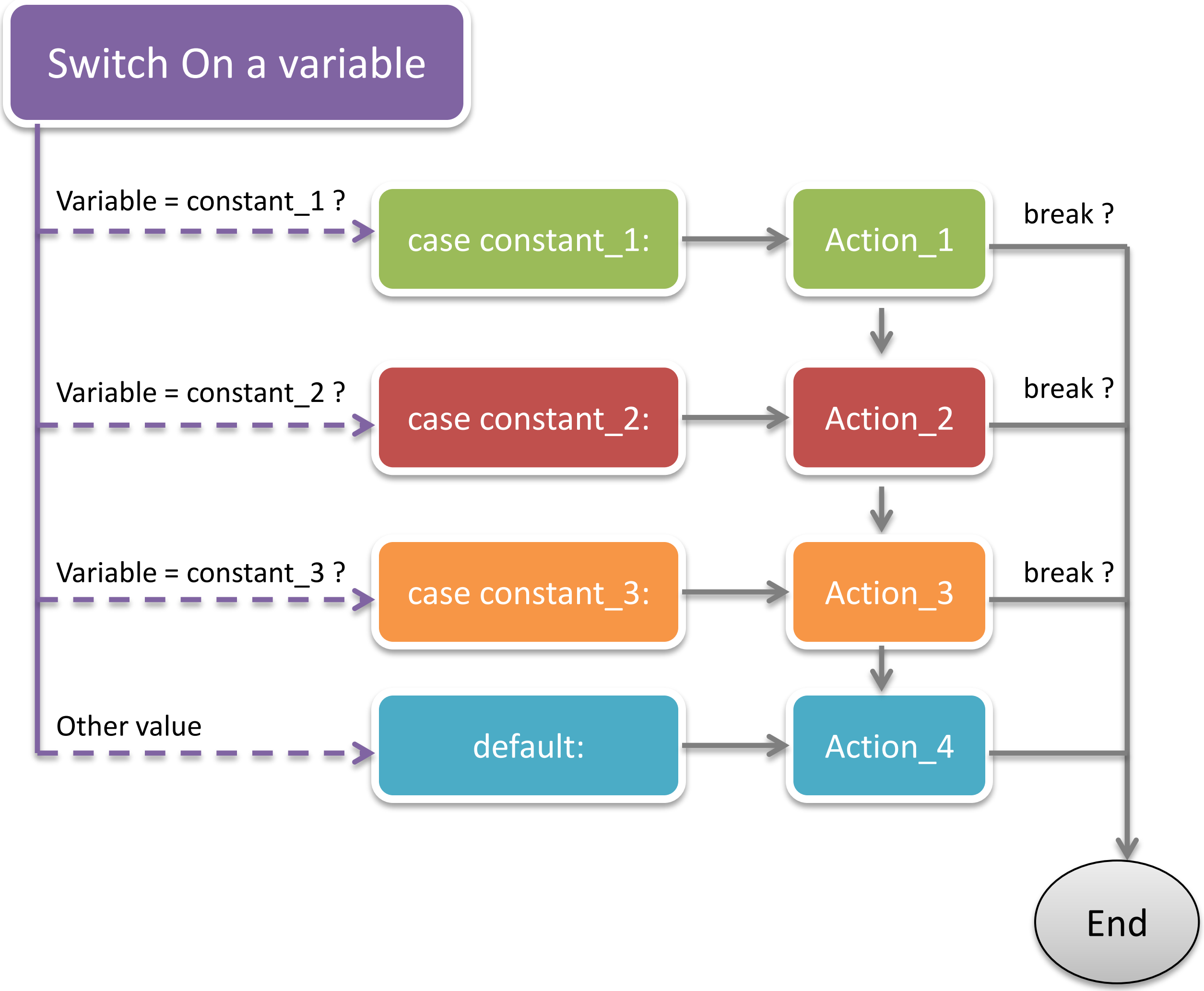
```
#include <stdio.h>

void main(void)
{
      int x = 10;
      if ( x == 10 )
            printf ("Ahmed\n");

      else
            printf ("Youssef\n");
            printf ("Samir");

}
```

# Switch Statement in C

***Switch statement*** is a control statement that allows us to choose only one choice among many choices.

It compares the a variable value with the values present in the different cases. Then it executes that block of code which matches the case value.

If there is no match, then default block is executed

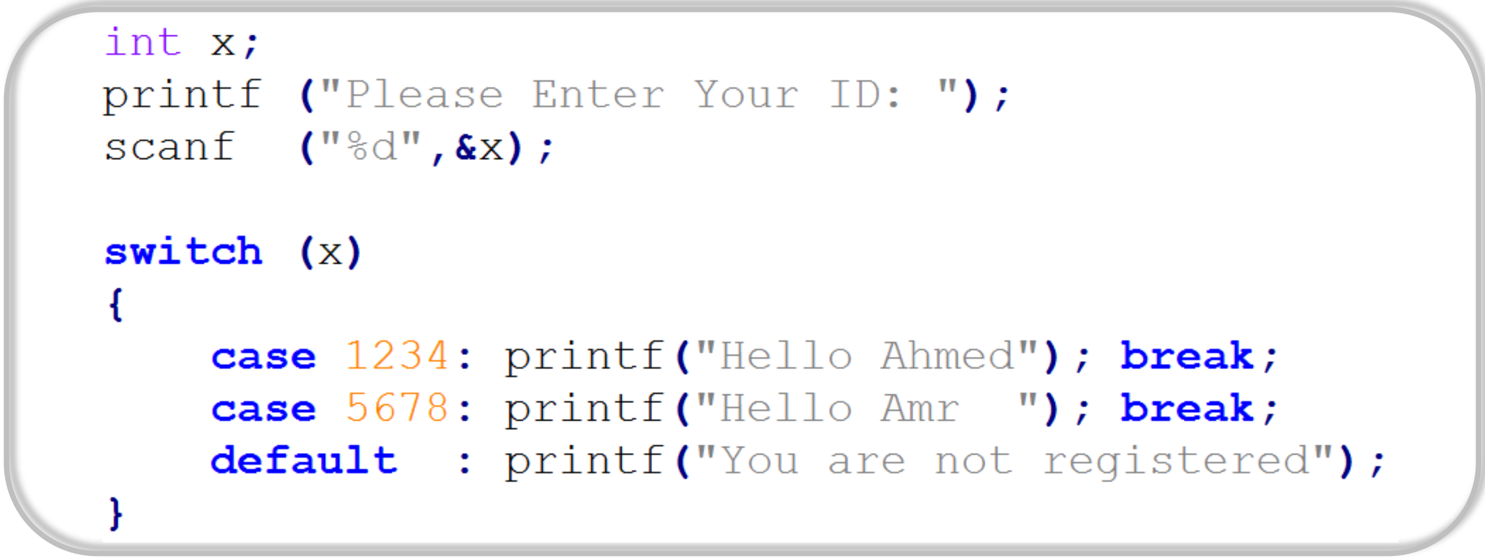


# Switch Statement in C

**Syntax**

```
switch ( variable )
{
    case Value_1:   /* Code */  break;
    case Value_2:   /* Code */  break;
    default        :   /* Code */
}
```

**Example**



```c
int x;
printf ("Please Enter Your ID: ");
scanf  ("%d",&x);

switch (x)
{
    case 1234: printf("Hello Ahmed"); break;
    case 5678: printf("Hello Amr   "); break;
    default  : printf("You are not registered");
}
```

# LAB 5

Login System:

Write a C code that ask the user to enter his ID and then the program will print his name.

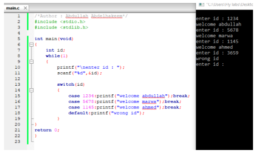
Available IDs are:

1234-> Ahmed

5678 -> Youssef

1145 -> Mina

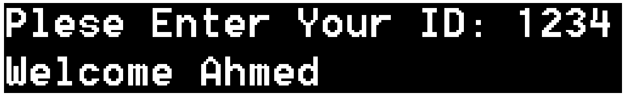
Any other number, the program will print ***Wrong ID***



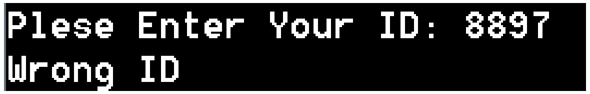
```c
/*Author : Abdullah Abdelhakeem*/
#include <stdio.h>
#include <stdlib.h>

int main(void)
{
    int id;
    while(1)
    {
        printf("\nenter id : ");
        scanf("%d",&id);

        switch(id)
        {
            case 1234:printf("welcome abdullah");break;
            case 5678:printf("welcome marwa");break;
            case 1145:printf("welcome ahmed");break;
            default:printf("wrong id");
        }
}
return 0;
}
```

```
enter id : 1234
welcome abdullah
enter id : 5678
welcome marwa
enter id : 1145
welcome ahmed
enter id : 3659
wrong id
enter id :
```

## Expected Output



```
Plese Enter Your ID: 1234
Welcome Ahmed
```



```
Plese Enter Your ID: 8897
Wrong ID
```

Time To

Code

# Switch Statement rules

1.case constant ***must be unique***

2.case constant ***can’t be a variable***

3.case constant must be ***integral value***

4.Only one default is allowed

5.default label is Optional

6.default can be placed ***anywhere in the switch***

7.break Statement ends the switch

8.if the break statement is not exist, the all following code will be executed ***until the end of the switch or until it finds a break*** statement without checking the case constant

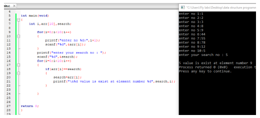
9.Nesting ( switch within switch ) ***is allowed***.

# The End ...

Any questions

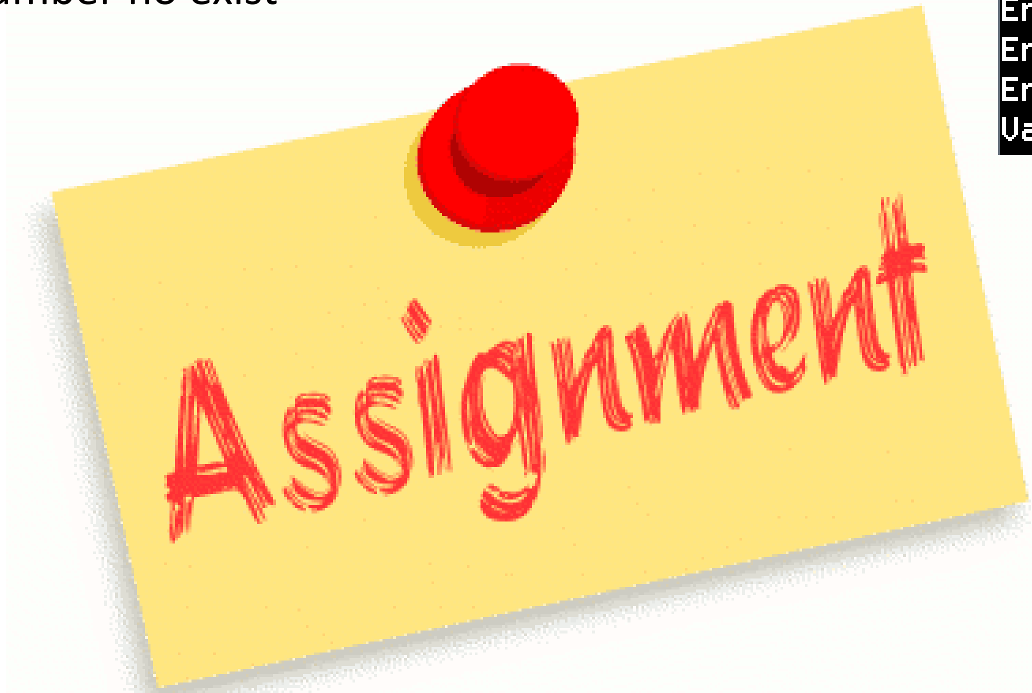
...?

# Assignment 1

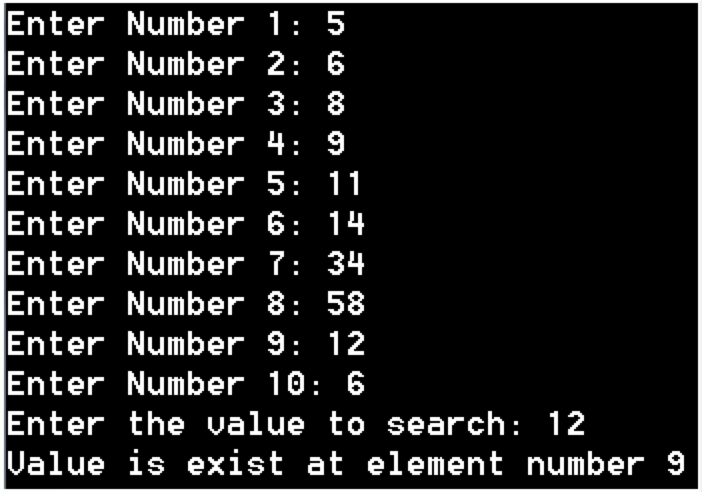


Write a C code that ask the user to enter 10 numbers, then ask him to enter another number to search on it in the 10 numbers and print its location in case it is found.

In case the number is not found, it will print number no exist



Expected Output



```
Enter Number 1: 5
Enter Number 2: 6
Enter Number 3: 8
Enter Number 4: 9
Enter Number 5: 11
Enter Number 6: 14
Enter Number 7: 34
Enter Number 8: 58
Enter Number 9: 12
Enter Number 10: 6
Enter the value to search: 12
Value is exist at element number 9
```

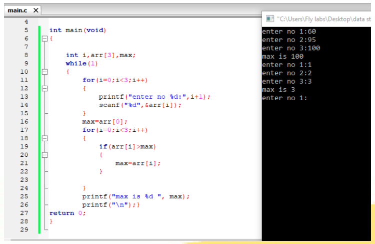
# Assignment 2

Write a C code that ask the user to enter his ID, if the ID is valid it will ask the user to enter his password, if the password is correct the program will print the user name, if the password is incorrect the program will print ***Incorrect Password***.

In case of not existing ID, the program will print ***Incorrect ID***

# Assignment 3

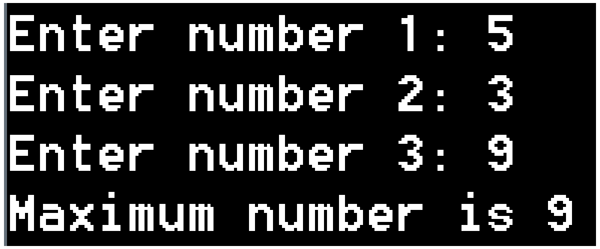
Write a code that will ask the user to enter 3 numbers, the program will print the maximum number of them.



```c

int main(void)
{

    int i,arr[3],max;
    while(1)
    {
        for(i=0;i<3;i++)
        {
            printf("enter no %d:",i+1);
            scanf("%d",&arr[i]);
        }
        max=arr[0];
        for(i=0;i<3;i++)
        {
            if(arr[i]>max)
            {
                max=arr[i];
            }

        }
        printf("max is %d ", max);
        printf("\n");}
return 0;
}

```

```
enter no 1:60
enter no 2:95
enter no 3:100
max is 100
enter no 1:1
enter no 2:2
enter no 3:3
max is 3
enter no 1:
```

Expected Output



```
Enter number 1: 5
Enter number 2: 3
Enter number 3: 9
Maximum number is 9
```

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