

Examples with various Input/Output Schemes & Decision Making

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Structure of C Program

```
# include < header file> // # is pre-processor directive
#define x 5 //symbolic constant
int a, b; //global variable declaration
int fxn(); // function declaration
main() //main function
{
int i,j,k; // local variable declaration
Input statements;
Process;
Output Statements;
}
```

Hello Students

Program 1

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

```
main() // by default main function is of int type
```

```
{
```

```
printf("Hello Students\n");
```

```
} // In this program we face a warning at the time of  
compilation. Corrected program is
```

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

```
main()
```

```
{
```

```
printf("Hello Students\n");
```

```
return 0; }
```

Sum of Two Numbers Program 2

```
# include <stdio.h>

main( )
{ int a=5,b=6,c;
c=a+b;
printf("The sum is = %d", c);
return 0;
}
```

Sum of Two Numbers Program 3

```
# include <stdio.h>
main( )
{
int a,b,c;
scanf(“%d %d”, &a, &b);
c=a+b;
printf(“The sum is = %d”, c);
return o;
}
```

Sum of Two Numbers Program 4

```
# include <stdio.h>

void main()

/* void is data type which says function should not return
any value*/

{ int a,b;

scanf(“%d %d”, &a, &b);

printf(“The sum is = %d”, a+b);

}
```

Sum of Two Numbers Program 5

```
# include <stdio.h>
#include <conio.h>
void main()
{
int a,b; clrscr();
printf("Please enter the value of a & b");
scanf("%3d %3d", &a, &b); //here 3 is maximum field width
printf("The sum is = %3d", a+b);
// in this 3 is minimum filed width
}
```

Sum of Two Numbers Program 6

```
# include <stdio.h>
#include <conio.h>
void main()
{
int a,b; clrscr();
printf("Please enter the value of a & b");
scanf("%3d %3d", &a, &b);
printf("The sum of %d & % d is = %3d", a, b,
a+b);
}
```


Field Width

Program 7

```
# include <stdio.h>
#include <conio.h>
void main()
{
    int a,b; clrscr(); printf("Please enter the value of a & b");
scanf("%3d %3d", &a, &b); //Maximum F Wdth

printf("The sum of %3d & % 3d is = %3d", a, b, a+b);
} //here is minimum field width
```

- If you entered 9999999 – the input taken is only 999 & 999 but output given 1998

Swapping using Temp. Variable. Program 8

```
# include <stdio.h>
#include <conio.h>
void main() { int a,A, T; clrscr();
printf("Please enter the value of a & A");
scanf("%d%d", &a, &A);

printf("Before Swapping a is %d \t A is %d ", a, A);

T=a;  a=A;  A=T;

printf("After Swapping a is %d \t A is %d ", a, A); }
```

Swapping without Temp. Variable. Program 9

```
# include <stdio.h> //used variable name other than a and b
#include <conio.h>
void main() { int ajay, bijay;; clrscr();
printf("Please enter the value of ajay & bijay");
scanf("%d %d", &ajay, &bijay);

printf("Before Swapping ajay is %d \t bijay is %d ", ajay, bijay);

ajay = ajay + bijay;    bijay = ajay-bijay;    ajay = ajay -bijay;

printf("After Swapping ajay is %d \n bijay is %d ", ajay, bijay); }
```

Lowercase to Uppercase conversion Program 10

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

```
#include <ctype.h>
```

```
void main() {
```

```
char ch;
```

```
printf("Please enter any alphabet");
```

```
ch= getchar()
```

```
printf("The Equivalent character is \t");
```

```
putchar(toupper(ch));
```

```
}
```

When a string is in input **Program 11**

```
# include <stdio.h>
void main() {
char name[20]; int rollno;
scanf("%s %d", name, &rollno); /*There is no need to put a &
with string name, because compiler may confused with the
addresses of characters*/
printf("%s %d", name, rollno);
}
```

Your input may be of : Sumit 1234 or Sumit 1234

Sumit

1234 (Space terminate string)

Output is Sumit 1234

When a string is in input **Program 12**

```
# include <stdio.h>
void main() { char name[20]; int rollno;
scanf(“%[ ABCDEFGHIJKLMN]”, name); /* The
characters(as per case) given in scanf are valid character
for input. Like space & other given character, if we give
input GAGAN DEEP, the input taken upto GAGAN DEE, P
terminate the string*/
printf(“%s ”, name); //whereas in output %s works for a full
string
}
```

Your input may be of : GAGAN DEEP

Output is GAGAN DEE

(Only character other than the given character s can terminate the string.)

When a string is in input **Program 13**

```
# include <stdio.h>
void main() {
char name[20]; int rollno;
scanf("%[^C]", name); /* ^ circumflex, string only be
    terminated by the character given after ^*/
printf("%s", name);
}
```

Your input may be of :

GAGAN DEEP..... Now you may enter whatever you want only string terminated by is C

Output is :

GAGAN DEEP..... Now you may enter whatever you want only string terminated by is

WAP to find ASCII value of a character

Program 14

```
#include <stdio.h>
#include <conio.h>
void main()
{ char c;
printf("Enter a character: ");
scanf("%c",&c); // Takes a character from user
printf("ASCII value of %c = %d",c,c);
getch(); }
```


Discuss following inputs/outputs

inputs

- %C %C
- %C %1S

Outputs

- 10S
- 10.5S

Discuss following flags in output

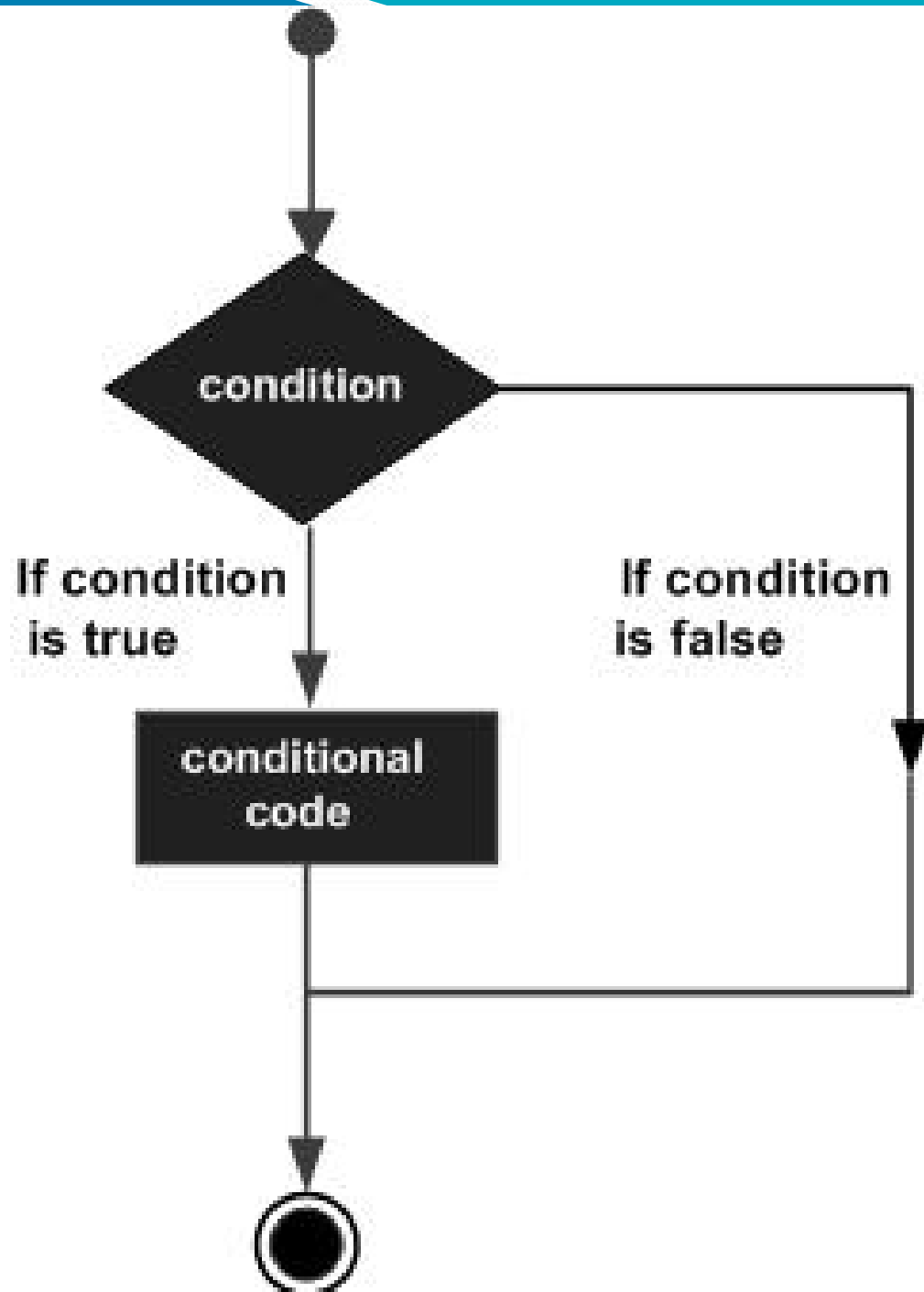
- -
- +
- 0
- # in Octal and Hexadecimal
- # in e, f, g

Exercise

- WAP to calculate Simple interest.
- WAP to calculate area of triangle.
- WAP to calculate area of rectangle.
- WAP to calculate area of circle.

Decision Making

- C program may require that a logical test be carried out at some particular point within the program. One of several possible actions will then be carried out, depending upon the outcome of the logical test. This is known as branching.
- There is also a special kind of branching, called selection, in which one group of statement is selected from several available groups.
- C conditional statement allow you to make decision, based upon the result of a condition.
- These statement are also known as **decision making statement**, **conditional statement**, **branching statement** or **selection statements**.



Types of if-else statements.

- if -then
- if-then-else
- Nested If
- Ladder if

if –then Statement

- In if-then statement then is always be silent
- **Basic If Syntax**
- The structure of an if statement is as follows:
if (Condition is TRUE)
Statement will be Executed

Here is a simple example that shows the syntax:

```
if ( 3 < 8 )  
printf( "Yes Three is less than Eight");
```

- Here, we're just evaluating the statement, "is Three less than Eight" .

Program 15

- Calculate commission of a salesman, if sale >5000 comm is 10%.

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

```
void main()
```

```
{
```

```
float sale, comm=0;
```

```
printf ("Please enter sale");
```

```
scanf ("%f", &sale);
```

```
if (sale>5000)
```

```
comm = sale x 10/100; /*Take care : here 10/100 gives us 0  
So use 10.0/100 or 0.1)*/
```

```
printf ("The Commission is =%f", comm); }
```


if –then-else Statement

- The structure of an if statement is as follows:

if (Condition is TRUE)

Statement 1 will be Executed

else

Statement 2 will be Executed

Here is a simple example that shows the syntax:

```
if ( 3 < a )
```

```
printf( “Yes, Three is less than a”);
```

```
else
```

```
printf( “No, a is less than three ”);
```

Program 16

- Calculate commission of a salesman, if sale >5000 comm is 10% else comm is 5%

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

```
void main()
```

```
{
```

```
float sale, comm;
```

```
printf ("Please enter sale");
```

```
scanf ("%f", &sale);
```

```
if (sale>5000)
```

```
comm = sale x 10.0/100;
```

```
else
```

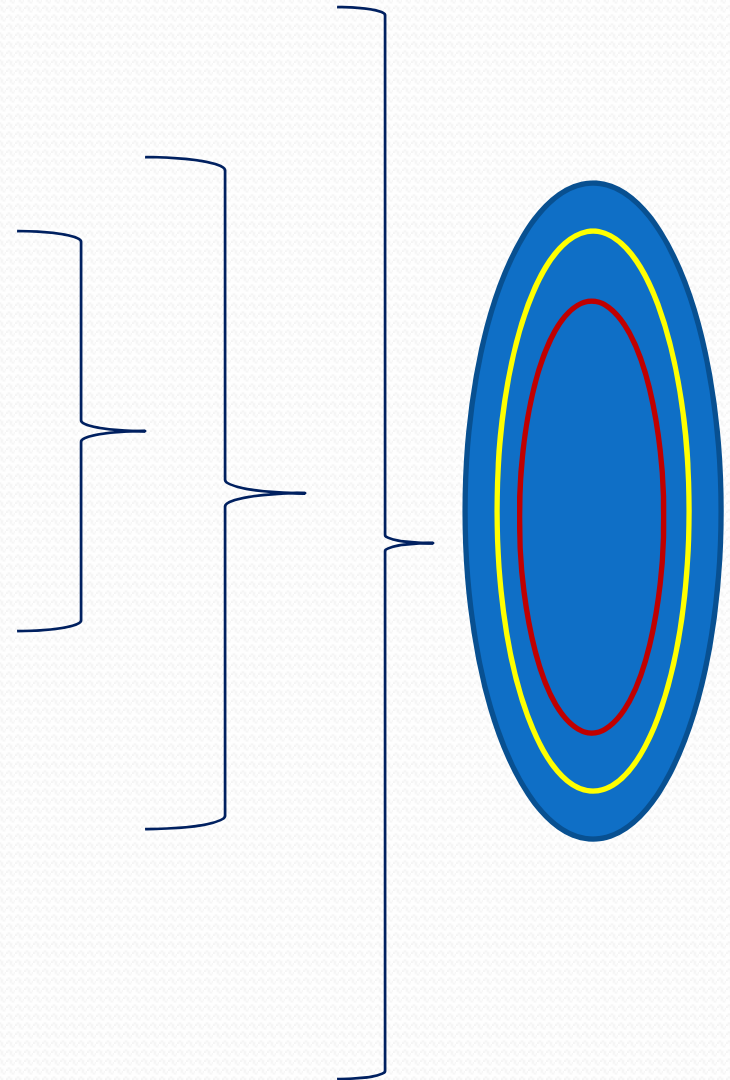
```
comm=sale x 5.0/100;
```

```
printf ("The Commission is =%f", comm); }
```

Nested if Statement

- The structure of an if statement is as follows:

```
if ( Condition1 is TRUE )  
  if ( Condition2 is TRUE )  
    if ( Condition3 is TRUE )  
      Statement 1 will be Executed  
    else  
      Statement 2 will be Executed  
  else  
    Statement 3 will be Executed  
else  
  Statement 4 will be Executed
```



Program 17

- Find the largest of three

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

```
void main()
```

```
{ int a,b,c,big; printf (“Please enter the value of a,b,c”);
```

```
scanf (“%d%d%d”, &a,&b,&c);
```

```
if (a>b)
```

```
if(a>c)
```

```
big=a;
```

```
else big=c;
```

```
else if (b>c)
```

```
big=b;
```

```
else big=c;
```

```
printf (“The Largest is =%d”, big); }
```

Ladder if Statement

- The structure of an if statement is as follows:

if (Condition₁ is TRUE)

Statement 1 will be Executed

else if (Condition₂ is TRUE)

Statement 2 will be Executed

else if (Condition₃ is TRUE)

Statement 3 will be Executed

else Statement 4 will be Executed

Program 18

- Calculate commission of a salesman, if sale >5000 comm is 10%, if sale >10000 comm is 20%, if sale >20000 comm is 30%

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

```
void main()
```

```
{ float sale, comm=0; printf ("Please enter sale");
```

```
scanf ("%f", &sale);
```

```
if (sale>20000)
```

```
comm = sale x 30.0/100;
```

```
    else if (sale>10000)
```

```
        comm = sale x 20.0/100;
```

```
            else if (sale>5000)
```

```
                comm = sale x 10.0/100;
```

```
printf ("The Commission is =%f", comm); }
```

Switch..case Statement

- C Switch..case statement is used when we have to choose one option out of multiple options.
- Decision making are needed when, the program encounters the situation to choose a particular statement among many statements. If a programmer has to choose one block of statement among many alternatives, nested if..else can be used but, this makes programming logic complex. This type of problem can be handled in C programming using switch statement.
- A **switch** statement allows a variable to be tested for equality against a list of values.

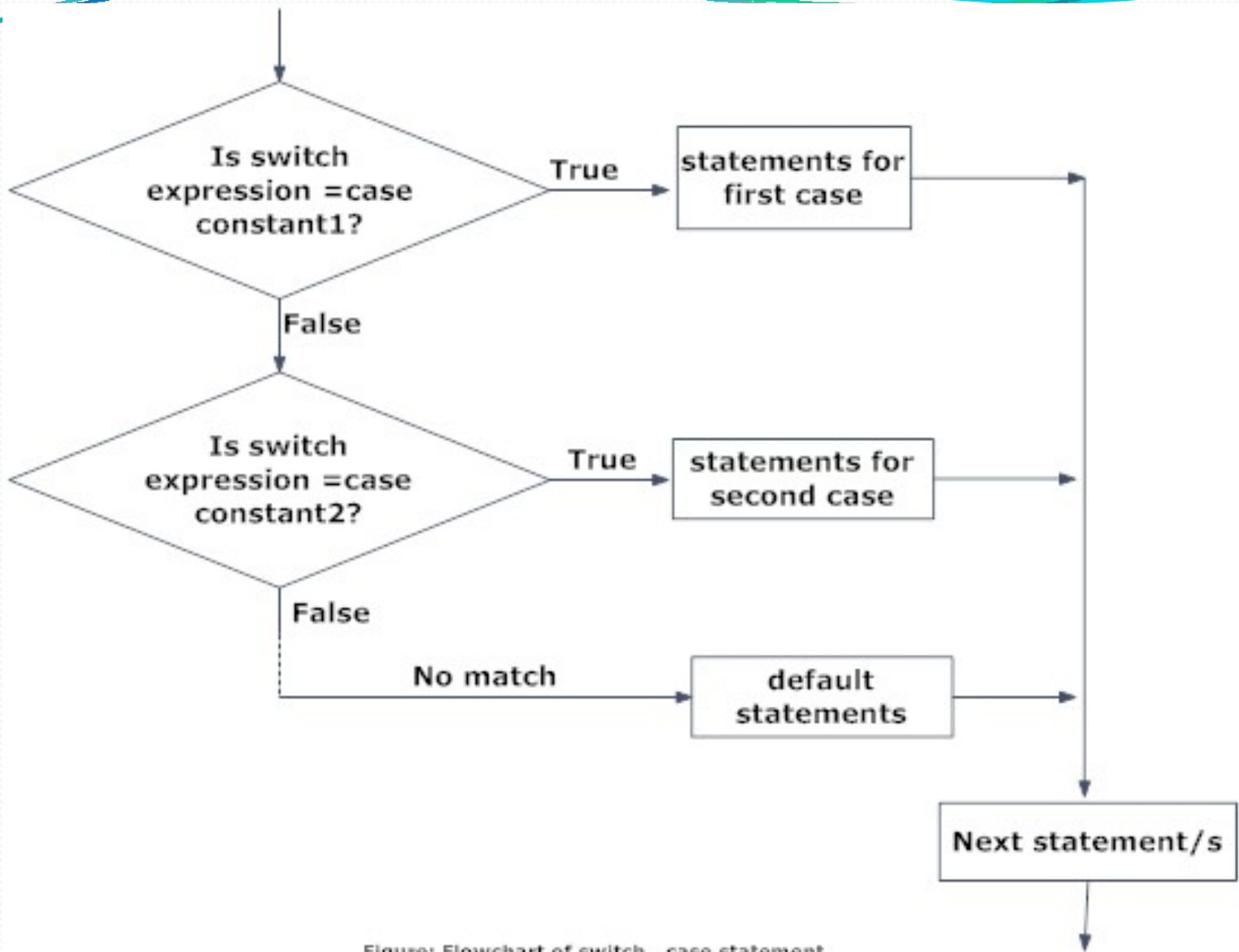


Figure: Flowchart of switch...case statement


```
switch(variable/constant)
```

```
{
```

```
case 1:
```

```
    /* your code */
```

```
    break;
```

```
:
```

```
:
```

```
case n:
```

```
    // your code
```

```
    break;
```

```
default:
```

```
    //your code
```

```
    }
```

Program 19

```
#include<stdio.h>
void main()
{ int a;
printf("Please enter a no between 1 and 5: ");
scanf("%d",&a);
switch(a)
{ case 1: printf("You chose One"); break;
case 2: printf("You chose Two"); break;
case 3: printf("You chose Three"); break;
case 4: printf("You chose Four"); break;
case 5: printf("You chose Five."); break;
default : printf("Invalid Choice. Enter a no between 1 and 5");
} //if you have more statements in any case then use compound
} //statement
```

Program 20

C program to check whether input alphabet is a vowel or not

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

```
void main()
```

```
{ char ch; printf("Enter a character\n");
```

```
scanf("%c", &ch);
```

```
if (ch == 'a' || ch == 'A' || ch == 'e' || ch == 'E' || ch == 'i' ||  
    ch == 'I' || ch == 'o' || ch == 'O' || ch == 'u' || ch == 'U')
```

```
    printf("%c is a vowel.\n", ch);
```

```
else
```

```
    printf("%c is not a vowel.\n", ch);
```

```
}
```

Program 21

C program to check whether input alphabet is a vowel or not

```
#include <stdio.h>
void main()
{ char ch; printf("Input a character\n"); scanf("%c", &ch);
switch(ch)
{ case 'a':
case 'A':
case 'e':
case 'E':
case 'i': case 'I': case 'o': case 'O': case 'u': case 'U':
printf("%c is a vowel.\n", ch); break;
default:
printf("%c is not a vowel.\n", ch); } }
```

Program 22

C program to check the largest out of 3 variable.

```
#include <stdio.h>
void main()
{ int a,b,c,big;
  scanf(“%d %d %d”,&a,&b,&c);
  if (a>b)
  if (a>c)
    big=a;
  else big = c;
  else if(b>c)
    big=b;
    else big=c;
  printf (“The largest out of three is = %d”, big); }
```

Program 23

C program to check the largest out of 4 variable.

```
#include <stdio.h>
void main()
{ int a,b,c,big;
  scanf("%d %d %d",&a,&b,&c);
  if (a>b)
  if (a>c)
  if(a>d)
      big=a;
  else big = d;
      else if(c>d)
      big=c;
      else big=d;
  printf ("The largest out of
  Four is = %d", big); }
```

Program 24

Write a program to make calculator

```
# include <stdio.h>
void main()
{ char c; float a,b;
printf("Enter operator either + or - or * or / :");
scanf("%c",&c); //if the character is not taken here we can take it further
printf("Enter two operands: ");
scanf("%f%f",&a,&b);
switch(c)      //switch(c=getchar())
{ case '+': printf("%.2f + %.2f = %.2f",a, b, a+b); break;
case '-': printf("%.2f - %.2f = %.2f", a, b, a-b); break;
case '*': printf("%.2f * %.2f = %.2f", a, b, a*b); break;
case '/': printf("%.2f / %.2f = %.2f", a, b, a/b); break;
default: printf("Error! operator is not correct"); } }
```

Continued as

Contents to be discussed in 3rd Lecture

- Loops

Contents to be discussed in 4th Lecture

- Nested Loops
- Jumping statements

Contents to be discussed in 5th Lecture

- Arrays

Contents to be discussed in 6th Lecture

- Functions

.....SO ON



THANKS!

If you have any queries you can

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