Decision Making, Branching & Switch
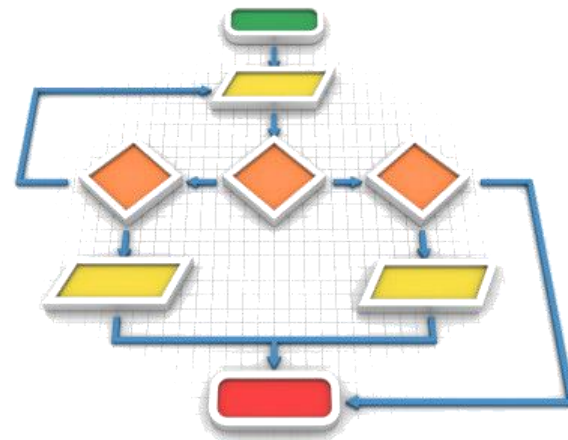
L8-T3

Learning Objectives

- To learn and appreciate the following concepts

    - The switch Statement
    - Examples

Learning Outcome

- At the end of session student will be able to learn and understand
    - The switch Statement
    - Use Switch statement

The `switch` statement

```
switch ( expression )
{
        case value1:
                program statement
                program statement
                ...
                break;
        case value2:
                program statement
                program statement
                ...
                break;
        case value n:
                program statement
                program statement
                ...
                break;
        default:
                program statement
                program statement
                ...
}
```

The *expression* is successively compared against the values *value1, value2, ..., valuen*. If a case is found whose value is equal to the value of *expression*, the program statements that follow the case are executed.

The switch test expression must be one with an integer value (including type char) (No float !).

The case values must be integer-type constants or integer constant expressions (You can't use a variable for a case label !)

switch- *control flow*
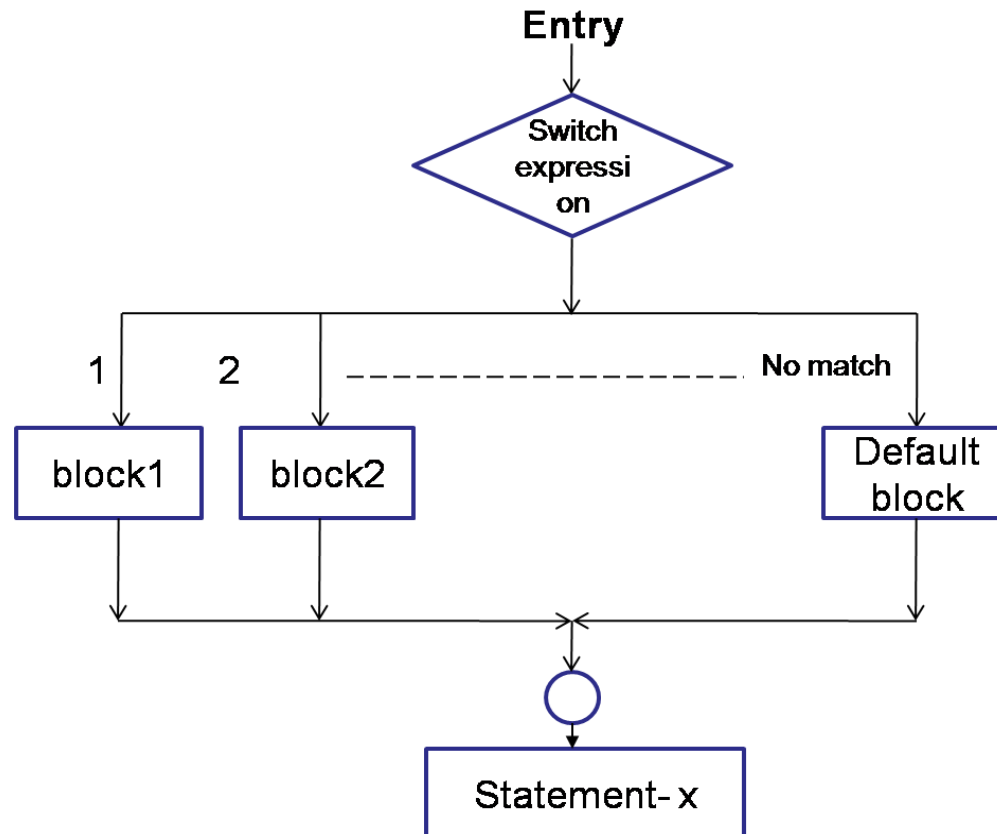
switch- example 1

```c
#include<stdio.h>
int main()
{
    int choice;
    printf("Enter your choice: 1-yes, 2-no\n");
    scanf("%d",&choice);
    switch(choice)
    {
        case 1:   printf("YESSSSSSS……");
                    break;
        case 2:   printf("NOOOOOO……");
                    break;
        default:  printf("DEFAULT CASE…….");
    }       printf("The choice is %d",choice);
    return 0;
}
```

switch- *example 2*

```
scanf("%d",&mark);

switch (mark)
{
case 100:
case  90:
case  80:   grade='A';
               break;



case  70:
case  60:
          grade='B';
          break;
```

```
case  50:
               grade='C'
               break;
case 40:
               grade='D'
               break;


default:   grade='F';
               break;
     }
 printf("%c",grade);
```

An Example – switch case

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

switch(ch)
{
  case 'a' : printf("Vowel");
  break;
  case 'e' : printf("Vowel");
  break;
  case 'i' : printf("Vowel");
  break;
  case 'o' : printf("Vowel");
  break;
  case 'u' : printf("Vowel");
  break;
  default: printf("Not a Vowel");       }
```

An Example – switch case

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

switch(ch)
{
    case 'a':
    case 'e':
    case 'i' :
    case 'o' :
    case 'u' : printf("Vowel");
    break;
    default: printf("Not a Vowel");      }
```

Example - `switch`

```c
/* Program to evaluate simple expressions
of the form value operator value */
#include <stdio.h>
int main (void)
{       float value1, value2;
    char operator;
    Int result;
    printf("Type in your expression.\n");
    scanf("%f %c %f",
    &value1,&operator,&value2);
    switch (operator)
     {case '+':
        result=value1+value2;
        printf("%f",result);
        break;
     case '-':
        result=value1-value2;
        printf("%f",result);
        break;

    case '*':
        result=value1*value2;
        printf("%f",result);
        break;
    case '/':
        if ( value2 == 0 )
            printf("Division by
        zero.\n");
        else result=value1 / value2;
            printf("%f",result);
        break;
    default;
    printf("Unknown Operator");
    }
    return 0;
}
```
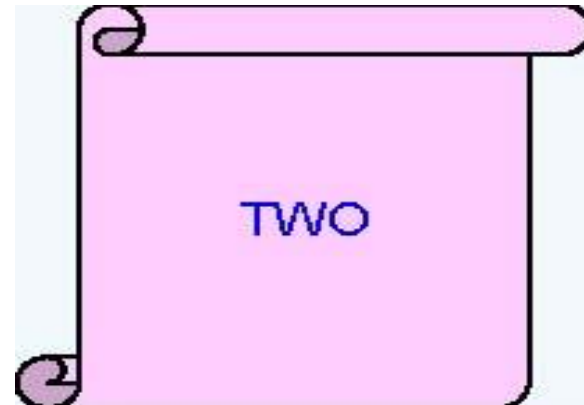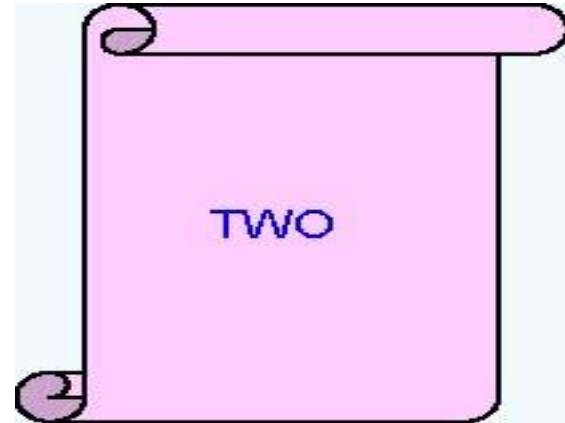
What is the output of the following code snippet?

```c
int iNum = 2;
switch(iNum)
{
    case 1:
                printf("ONE");
                break;
    case 2:
                printf("TWO");
              break;
    case 3:
                printf("THREE");
                break;
    default:
                printf("INVALID");
                    break;
}
```
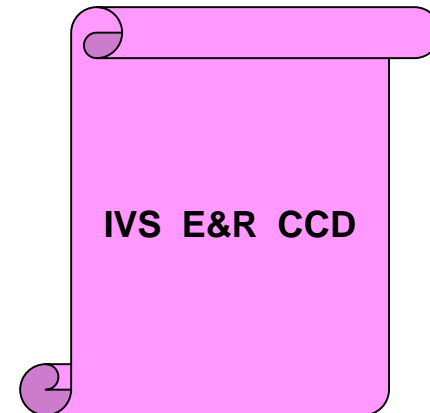
TWO

What is the output of the following code snippet?

```
iNum = 2;
switch(iNum)
 {
   default:
        printf("INVALID");
    case 1:
        printf("ONE");
   case 2:
        printf("TWO");
        break;
    case 3:
        printf("THREE");
 }
```

TWO

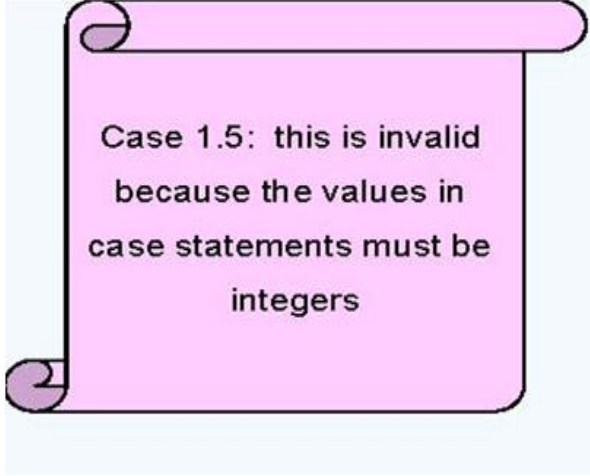# What is the output of the following code snippet?

```
switch (iDepartmentCode)
{
    case 110 : printf("HRD ");
    case 115 : printf("IVS ");
    case 125 : printf("E&R ");
    case 135 : printf("CCD ");
}
```

Assume iDepartmentCode is 115

find the output ?

IVS E&R CCD

What is the output of the following code snippet?

```
int iNum = 2;
switch(iNum)
{
    case 1.5:
        printf("ONE AND HALF");
        break;
    case 2:
        printf("TWO");
    case 'A' :
        printf("A character");
}
```

Case 1.5: this is invalid because the values in case statements must be integers

Problem: Find the roots of Quadratic equation using switch statement

```c
#include<stdio.h>
int main()
{
Int d;
float a,b,c,root1,root2,re,im, disc;
printf("Enter the values of a, b & c:");
scanf("%f %f %f",&a,&b,&c);
disc=b*b-4*a*c;
printf("\nDiscriminant= %f",disc);

        if(disc<0) d=1;
        if(disc==0) d=2;
        if(disc>0)  d=3;
switch(d)
 {
   case 1:
         printf("imaginary roots\n");
        re= - b / (2*a);
        im = pow(fabs(disc),0.5)/(2*a);
        printf("root1=%.21f+%.21fi and root2 =%.21f-%.2fi", re,im,re,im);
         break;
```

```
case 2:
        printf("Real & equal roots");
        re=-b / (2*a);
        printf("Root1 and root2 are %.21f",re);
        break;
case 3:
        printf("Real & distinct roots");
        printf("Roots are");
        root1=(-b + sqrt(disc))/(2*a);
        root2=(-b - sqrt(disc))/(2*a);
        printf("Root1 = %.21f and root2 =%.21f",root1,root2);
        break;
    } // end of switch
return 0;
} //End of Program
```

Some guidelines for writing switch case statements

(1) Order the cases alphabetically or numerically – improves readability.

(2) Put the normal cases first ; put the exceptional cases later.

(3) Order cases by frequency:-put the most frequently executed cases first and the least frequently used cases later.

(4) Use default case to detect errors and unexpected cases [user friendly messages].

Poll Question

Go to chat box/posts for the link to the Poll question

Submit your solution in next 2 minutes

Click the result button to view your score