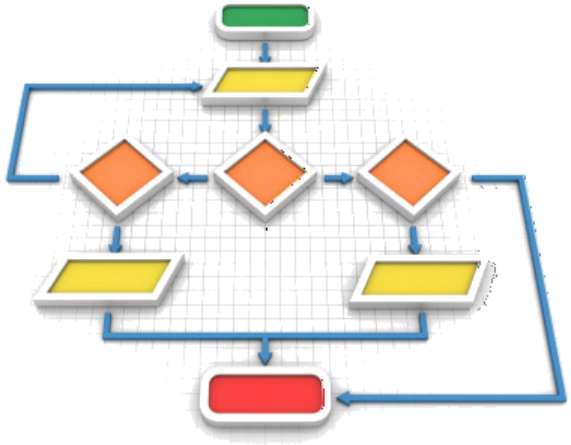
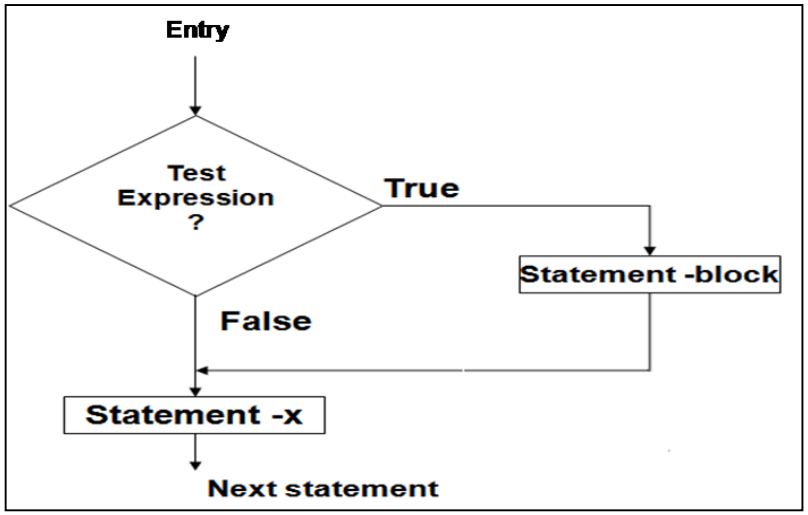
S7_1

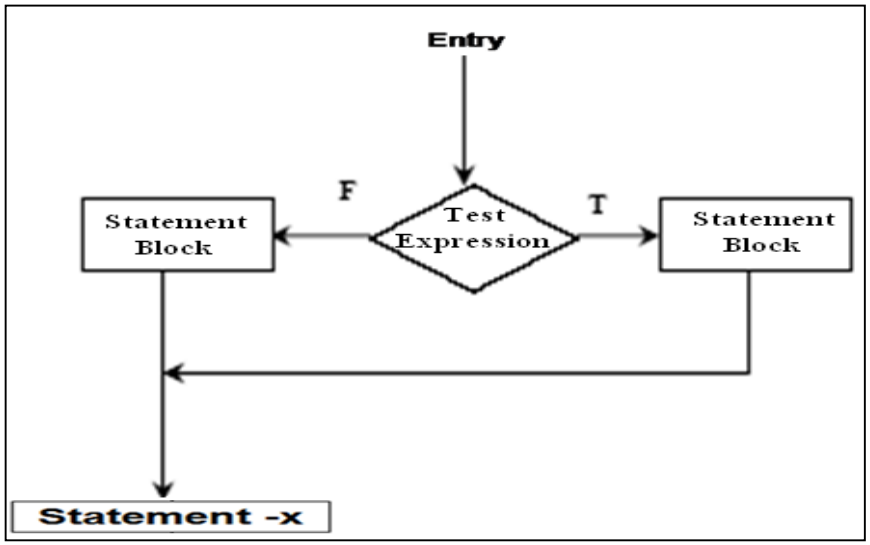
Decision Making, Branching - `switch`

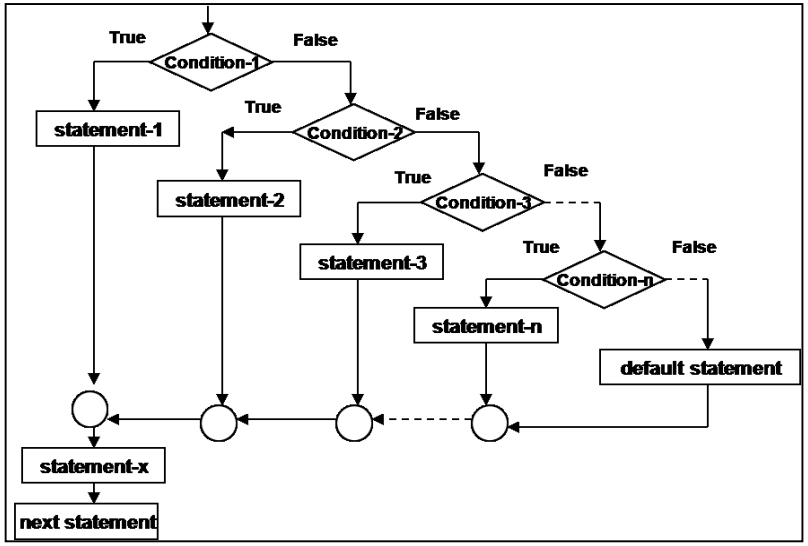


Review on decision making & branching

- if
- if-else
- Nested if
- else if Ladder
- switch







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
  - How to use `switch` statement

The `switch` statement

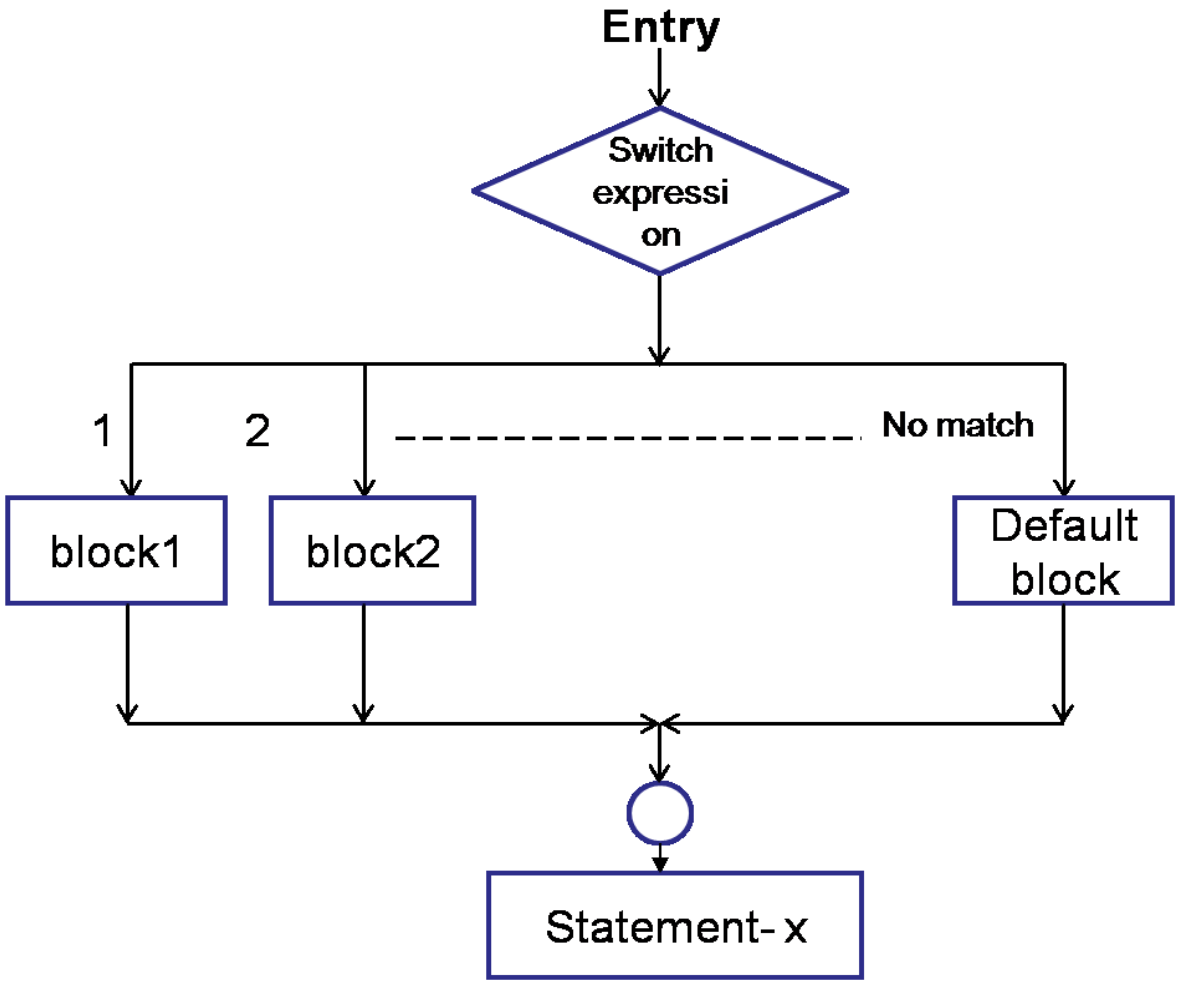
```
switch ( expression )
{
    case value1:
        program statement;
        program statement;
        ...
        break;
    case value2:
        program statement;
        program statement;
        ...
        break;
    case valuen:
        program statement;
        program statement;
     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

The *expression* is successively compared against the values *value1*, *value2*, ..., *valuen*. If a case match 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

```
#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/10)
{
case 10:
case  9:
case  8: grade='A';
         break;

case  7:
case  6:
         grade='B';
         break;

case  5:
         grade='C';
         break;
case 4:
         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

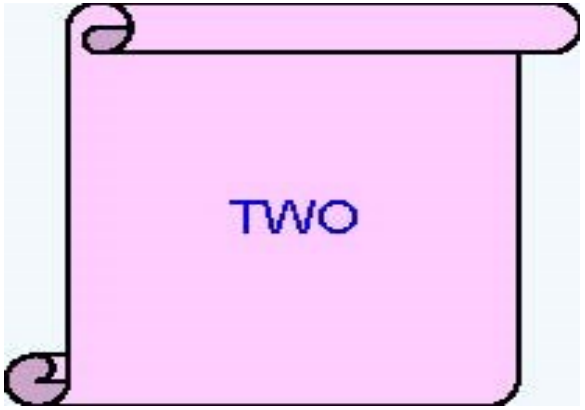
```
char ch;
scanf("%c", &ch);

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

Example - switch

```
/* Program to evaluate simple expressions
of the form value operator value */
#include <stdio.h>
int main (void)
{    float value1, value2, result;
     char operator;
     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”);
      } // end of switch
      return 0;
}
```

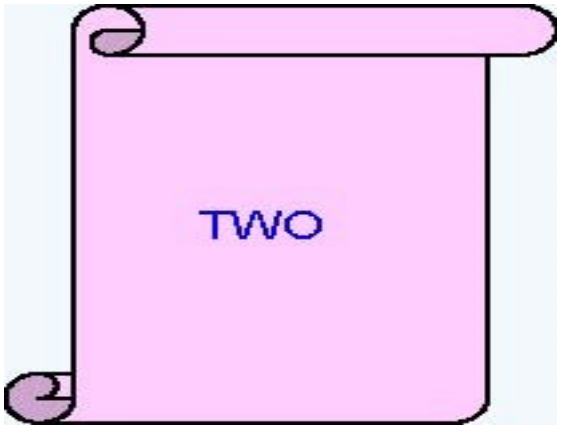
What is the output of the following code snippet?

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



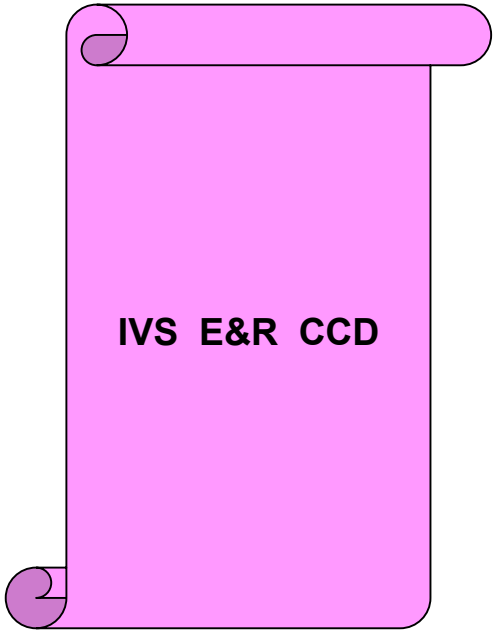
What is the output of the following code snippet?

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



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 ");
}
```

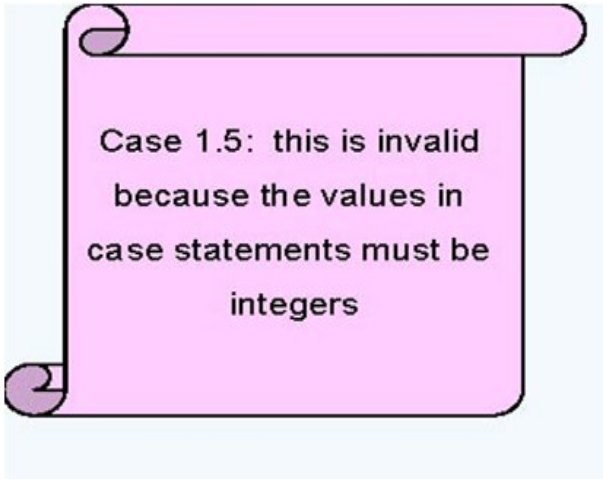


Assume iDepartmentCode is 115

find the output ?

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");
}
```



Poll Question

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

Submit your solution in next 2 minutes

The session will resume in 3 minutes

Problem: Find the roots of Quadratic equation using switch statement

```
#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=% .2lf+%.2lfi and root2 =%.2lf-%.2lfi", re, im, re, im);
            break;
```

Problem: Find the roots of Quadratic equation using switch statement

```
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 = %.2lf and root2 =%.2lf",root1, root2);
        break;
   } // end of switch
return 0;
} //End of Program
```

```
Enter the values of a, b & c:
   1
   2
   4

Discriminant= -12.000000
Imaginary roots
root1= -1.00 +  1.73i and root2 = -1.00 - 1.73i
```

printf("root1= % .2lf + %.2lfi and root2 = %.2lf - %.2lfi", re, im, re, im);

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].

Summary

- The `switch` Statement
- How to use `switch` statement