

CS1100 – Introduction to Programming

Lecture 8

Instructor: Shweta Agrawal (shweta.a@cse.iitm.ac.in)

Multiple Selection : **switch** construct

- Syntax:

```
switch (expression) {  
    case const-expr-1: statements-1;  
    case const-expr-2: statements-2;  
    :  
    default: statements-def;  
}
```

- Semantics

- Evaluate expression.
- If it matches the const-expr-i, execute statements-i and following as long as an **explicit break** is not encountered.
- If none of the const-expr-i match, execute the statements-def.

Even or odd – using switch

Given a number determine if it is even or odd.

```
#include<stdio.h>
int main() {

    int input;

    printf("Enter an integer: \t");
    scanf("%d", &input);

    switch (input % 2) {
        case 0: printf("Number is even\n");
        case 1: printf("Number is odd\n");
        default: printf("Neither even nor odd\n");
    }
    return 0;
}
```

Even or odd – using switch

Given a number determine if it is even or odd.

```
#include<stdio.h>
int main() {

    int input;

    printf("Enter an integer: \t");
    scanf("%d", &input);

    switch (input % 2) {
        case 0: printf("Number is even\n");
        case 1: printf("Number is odd\n");
        default: printf("Neither even nor odd\n");
    }
    return 0;
}
```

- What is the output of the program on 10, 5, 13?
- Observe the missing break.

Even or odd – using switch – a correct program

Given a number determine if it is even or odd.

```
#include<stdio.h>
int main() {

    int input;

    printf("Enter an integer: \t");
    scanf("%d", &input);

    switch (input % 2) {
        case 0: printf("Number is even\n"); break;
        case 1: printf("Number is odd\n"); break;
        default: printf("Neither even nor odd\n");
    }
    return 0;
}
```

Multiple Selection : **switch** construct

- Syntax:

```
switch (expression) {  
    case const-expr-1: statements-1;  
    case const-expr-2: statements-2;  
    :  
    default: statements-def;  
}
```

- Semantics

- Evaluate expression.
- If it matches the const-expr-i, execute statements-i and following as long as an **explicit break** is not encountered.
- If none of the const-expr-i match, execute the statements-def.

Even or odd – using switch

Given a number determine if it is even or odd.

```
#include<stdio.h>
int main() {

    int input;

    printf("Enter an integer: \t");
    scanf("%d", &input);

    switch (input % 2) {
        case 0: printf("Number is even\n");
        case 1: printf("Number is odd\n");
        default: printf("Neither even nor odd\n");
    }
    return 0;
}
```

Even or odd – using switch

Given a number determine if it is even or odd.

```
#include<stdio.h>
int main() {
    int input;

    printf("Enter an integer: \t");
    scanf("%d", &input);

    switch (input % 2) {
        case 0: printf("Number is even\n");
        case 1: printf("Number is odd\n");
        default: printf("Neither even nor odd\n");
    }
    return 0;
}
```

- What is the output of the program on 10, 5, 13?
- Observe the missing break.

Even or odd – using switch – a correct program

Given a number determine if it is even or odd.

```
#include<stdio.h>
int main() {

    int input;

    printf("Enter an integer: \t");
    scanf("%d", &input);

    switch (input % 2) {
        case 0: printf("Number is even\n"); break;
        case 1: printf("Number is odd\n"); break;
        default: printf("Neither even nor odd\n");
    }
    return 0;
}
```

More Examples

Check if a triangle is valid.

```
#include <stdio.h>
int main(void)
{
    int angle1, angle2, angle3, sum; //variable to store angles
    // Get three angles of triangle from the user
    printf("\n Enter 1st angle of triangle: = ");
    scanf("%d", &angle1);

    printf("\n Enter 2nd angle of triangle: = ");
    scanf("%d", &angle2);

    printf("\n Enter 3rd angle of triangle: = ");
    scanf("%d", &angle3);
    //Calculate sum of angles
    sum = angle1 + angle2 + angle3;
    //check sum of three angles
    if(sum == 180 && angle1 != 0 && angle2 != 0 && angle3 != 0)
    {
        printf("\n Valid Triangle.\n\n");
    }
    else
    {
        printf("\n Not valid Triangle.\n\n");
    }
    return 0;
}
```

More Examples

Check the type of a triangle.

```
#include <stdio.h>
int main(void)
{
    int triSide1, triSide2, triSide3;
    /* Get sides of a triangle from the user */
    printf("\n Enter first side of triangle: = ");
    scanf("%d", &triSide1);
    printf("\n Enter second side of triangle: = ");
    scanf("%d",&triSide2);
    printf("\n Enter third side of triangle: = ");
    scanf("%d",&triSide3);
    if((triSide1==triSide2) && (triSide2==triSide3))
    {
        /* If all sides are equal, then Equilateral triangle*/
        printf("\n Equilateral triangle.\n\n");
    }
    else if((triSide1==triSide2) || (triSide1==triSide3) || (triSide2==triSide3))
    {
        /* If two sides are equal, then Isosceles triangle*/
        printf("\n Isosceles triangle.\n\n");
    }
    else
    {
        /* If none sides are equal, then Scalene triangle*/
        printf("\n Scalene triangle.\n\n");
    }
    return 0;
}
```

More Examples

Convert Temperature from Fahrenheit to Celsius and Vice Versa.

```
#include <stdio.h>
int main()
{
    float fh,cl;
    char ch;
    printf("\n\n Press c to convert temperature from Fahrenheit to Celsius.");
    printf("\n\n Press f to convert temperature from Celsius to Fahrenheit.");
    printf("\n\n Enter your choice (c, f): ");
    scanf("%c",&ch);
    if((ch == 'c') || (ch == 'C'))
    {
        printf("\n\nEnter temperature in Fahrenheit: ");
        scanf("%f",&fh);
        cl= (fh - 32) / 1.8;
        printf("\n\nTemperature in Celsius: %.2f\n\n",cl);
    }
    else if((ch == 'f') || (ch == 'F'))
    {
        printf("\n\nEnter temperature in Celsius: ");
        scanf("%f",&cl);
        fh= (cl*1.8)+32;
        printf("\n\nTemperature in Fahrenheit: %.2f\n\n",fh);
    }
    else
    {
        printf("\n\nInvalid Choice !!!\n\n");
    }
    return 0;
}
```

More Examples

Check Vowel or Consonant.

```
#include <stdio.h>
int main()
{
    char cData;
    /* Get input from the user*/
    printf("\n Enter any character: ");
    scanf("%c", &cData);
    //check alphabate
    if((cData >= 'a' && cData <= 'z') || (cData >= 'A' && cData <= 'Z'))
    {
        // check for vowel
        if(cData=='a' || cData=='e' || cData=='i' || cData=='o' || cData=='u' ||
           cData=='A' || cData=='E' || cData=='I' || cData=='O' || cData=='U')
        {
            printf("\n It is an vowel.\n\n");
        }
        else
        {
            printf("\n It is a consonant.\n\n");
        }
    }
    else
    {
        printf("\n It is not an vowel nor consonant.\n\n");
    }
    return 0;
}
```