What is switch?

Switch is a great replacement to long else if constructs.

Example:

```
int x = 2;

if (x == 1)
    printf("x is 1");
else if(x == 2)
    printf("x is 2");
else if(x == 3)
    printf("x is 3");
else
    printf("x is a number
other than 1, 2 and 3");
```

```
int x = 2;

switch(x)
{
    case 1: printf("x is 1");
            break;
    case 2: printf("x is 2");
            break;
    case 3: printf("x is 3");
            break;
    default: printf("x is a
number other than 1, 2, and 3");
            break;
}
```

```
int x = 2;

switch(x)
{
    case 1: printf("x is 1");
            break;
    case 2: printf("x is 2");
            break;
    case 3: printf("x is 3");
            break;
    default: printf("x is a
number other than 1, 2, and 3");
            break;
}
```

Checks if x == 1

Suppose x == 1 condition is satisfied and there is no break after printf then subsequent expression will also get evaluated until we reach the next break.

If none of the cases are satisfied then default will be executed.
Default is optional.

Facts related to switch

1. You are not allowed to add duplicate cases.

```c
int main() {
    int x = 1;
    switch(x)
    {
        case 1: printf("x is 1");
            break;
        case 1: printf("x is 1");
            break;
        case 2: printf("x is 2");
            break;
    }
```

Output:

```
prog.c:9:6: error: duplicate case value
      case 1: printf("x is 1");
      ^
prog.c:7:6: error: previously used here
      case 1: printf("x is 1");
```

Facts related to switch

2 Only those expressions are allowed in switch which results in an integral constant value.

ALLOWED

```
int main() {
    int a = 1, b = 2, c = 3;
    switch(a+b*c)
    {
        case 1: printf("choice 1");
            break;
        case 2: printf("choice 2");
            break;
        default: printf("default");
            break;
    }
}
```

Output:

```
default
```

NOT ALLOWED

```
int main() {
    float a = 1.15, b = 2.0, c = 3.0;
    switch(a+b*c)
    {
        case 1: printf("choice 1");
            break;
        case 2: printf("choice 2");
            break;
        default: printf("default");
            break;
    }
}
```

```
prog.c: In function 'main':
prog.c:5:9: error: switch quantity not an integer
  switch(a+b*c)
         ^
```

Facts related to switch

3 Float value is not allowed as a constant value in case label. Only integer constants/constant expressions are allowed in case label.

NOT ALLOWED

```
int main() {
    float x = 3.14;
    switch(x)
    {
        case 3.14: printf("x is 3.14");
            break;
        case 1.1: printf("x is 1.14");
            break;
        case 2: printf("x is 2");
            break;
    }
}
```

```
prog.c:7:6: error: case label does not reduce to an integer constant
     case 3.14: printf("x is 3.14");
     ^
prog.c:9:6: error: case label does not reduce to an integer constant
     case 1.1: printf("x is 1.14");
```

ALLOWED

```
int main() {
    int x = 23;
    switch(x)
    {
        case 3+3: printf("choice 1");
            break;
        case 3+4*5: printf("choice 2");
            break;
        default: printf("default");
            break;
    }
}
```

```
choice 2
```

Facts related to switch

4 Variable expressions are not allowed in case labels. Although macros are allowed.

```c
#include <stdio.h>
#define y 2
#define z 23

int main() {
    int x = 2;
    switch(x)
    {
        case y: printf("Number is 2");
            break;
        case z: printf("Number is 23");
            break;
        default: printf("default case");
            break;
    }
}
```

Output:

```
Number is 2
```

Facts related to switch

5 Default can be placed anywhere inside switch. It will still get evaluated if no match is found.

```
int main() {
    int x = 2;
    switch(x)
    {
        default: printf("default case");
            break;
        case 1: printf("Number is 1");
            break;
        case 2: printf("Number is 2");
            break;
    }
}
```

Output:

```
Number is 2
```