Switch

Last updated 9/10/21

Switch

- Switch Statement
    - If… else allows a 2 way decision
    - Switch allows for n-way decisions
    - More restrictive on the tests

```
…
switch(variable){
    case val1: statement;
    case val2: statement;
    case val3: statement;
    default: statement;
}
```

variable (and valx) must be an integral value
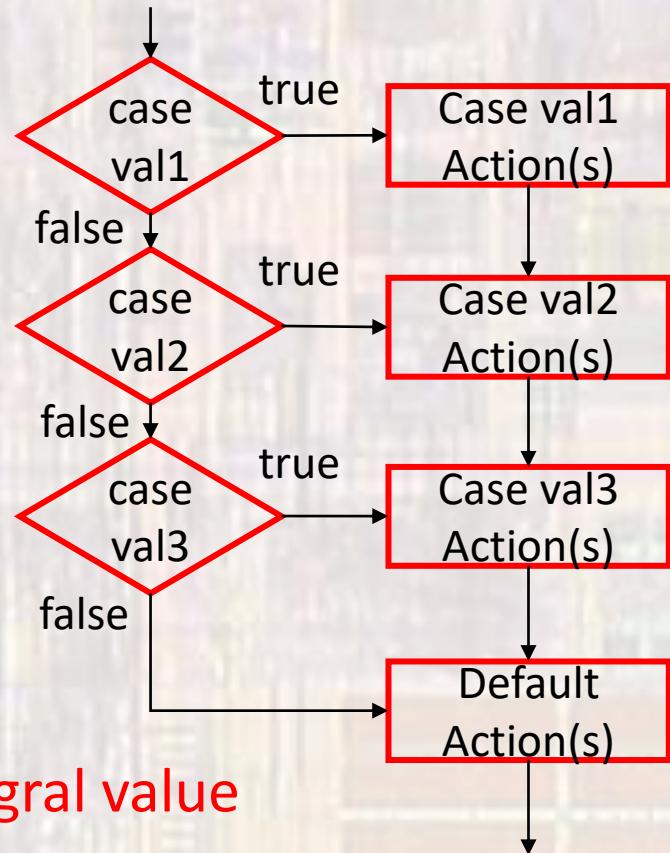
Switch

- ## Switch Example
  - ### Launch Countdown

Must be an integral type

variable to test

Cannot be an expression

Integral value

No { } required

{ } required

Always include a default even if empty

```
/////////////////////////////////
//
// switch_class_ex_1 project
//
// created 5/12/21 by tj
// rev 0
//
/////////////////////////////////
//
// basic switch example file for class
//
// Count down timer
//
/////////////////////////////////
#include "mbed.h"
#include <stdio.h>

#define T_WAIT 1000000      // in us - 1s

int main(void){
    setbuf(stdout, NULL);   // fix for terminal issue

    // splash
    printf("\n\nswitch_class_ex_1 - example for EE2905\n");
    printf("Using Mbed OS version %d.%d.%d\n\n",
            MBED_MAJOR_VERSION, MBED_MINOR_VERSION, MBED_PATCH_VERSION);

    // local variables
    int count_down;

    // get starting value
    printf("Please enter a number between 1 and 5 to start the countdown : ");
    scanf("%i", &count_down);
```

```
    // count down
    switch(count_down){
        case 5:
            printf("5\n");
            wait_us(T_WAIT);
        case 4:
            printf("4\n");
            wait_us(T_WAIT);
        case 3:
            printf("3\n");
            wait_us(T_WAIT);
        case 2:
            printf("2\n");
            wait_us(T_WAIT);
        case 1:
            printf("1\n");
            wait_us(T_WAIT);
        default:
            printf("Blast Off !");
    }// end switch

    return 0;
}// end main
```

```
switch_class_ex_1 - example for EE2905
Using Mbed OS version 6.10.0

Please enter a number between 1 and 5 to start the countdown : 5
5
4
3
2
1
Blast Off !
```

EE 2905

© tj

Switch

- ## Switch with break
  - Break statement: causes the current case to terminate and the switch to complete

```
switch(variable){
  case val1:    statement;
                statement;
                break;
  case val1:    statement;
                statement;
                break;
  default:      statement;
                statement;
                break;
}
```
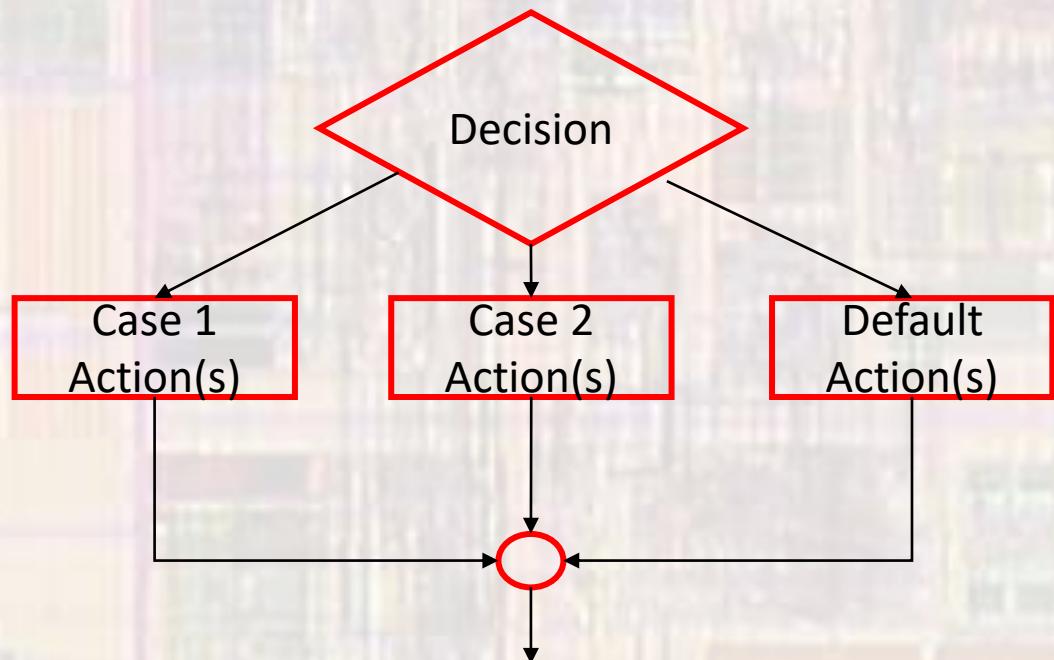
Switch

- Switch with break example

```
////////////////////////////////////
//
// switch_class_ex_2 project
//
// created 5/12/21 by tj
// rev 0
//
////////////////////////////////////
//
// basic switch example file for class
//
// Letter grade calculator
//
////////////////////////////////////
#include "mbed.h"
#include <stdio.h>

int main(void){
    setbuf(stdout, NULL);   // fix for terminal issue

    // splash
    printf("\n\nswitch_class_ex_2 - example for EE2905\n");
    printf("Using Mbed OS version %d.%d.%d\n\n",
            MBED_MAJOR_VERSION, MBED_MINOR_VERSION, MBED_PATCH_VERSION);

    // local variables
    int score;

    // generate an infinte loop
    while(1){
        // get starting value
        printf("\nPlease enter a test score 0 - 100 : ");
        scanf("%i", &score);

        // convert score to grade range
        score = score/10;   // using integer division
```

```
        // print grade
        switch(score){
            case 10:
            case 9:
                printf("A\n");
                break;
            case 8:
                printf("B\n");
                break;
            case 7:
                printf("C\n");
                break;
            case 6:
                printf("D\n");
                break;
            default:
                printf("F\n");
                break;
        }// end switch
    }// end while

    return 0;
}// end main
```

End switch here

Not necessary but considered a best practice
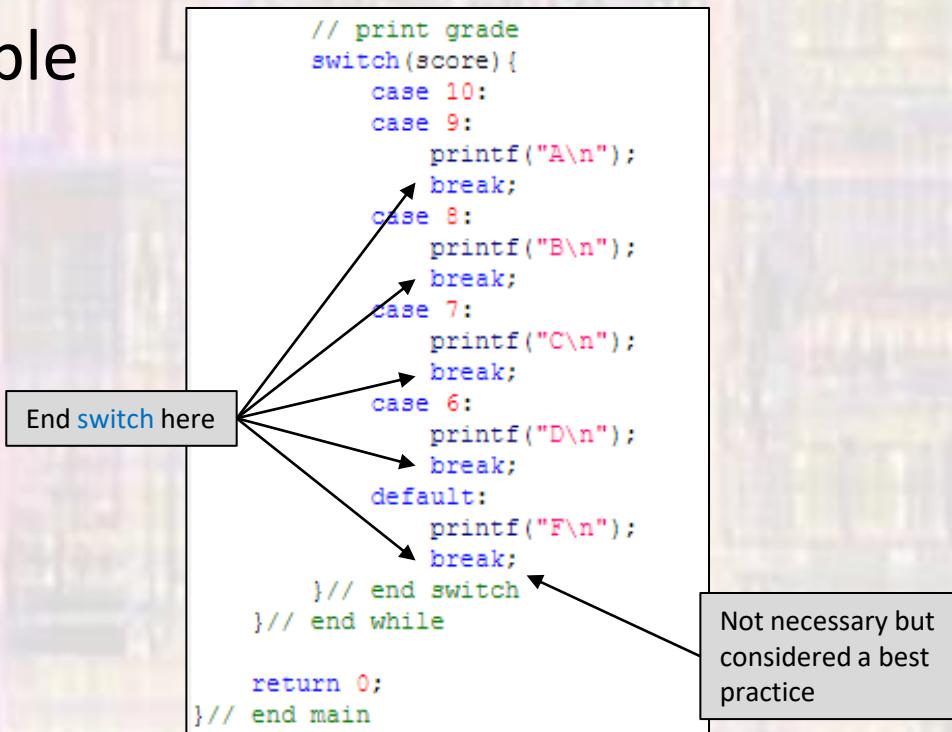
```
switch_class_ex_2 - example for EE2905
Using Mbed OS version 6.10.0


Please enter a test score 0 - 100 : 89
B

Please enter a test score 0 - 100 : 77
C

Please enter a test score 0 - 100 : 35
F

Please enter a test score 0 - 100 : 100
A
```

Switch

- Switch Statement
  - Mixing break and fall-through

```
//////////////////////////////////
//
// switch_class_ex_3 project
//
// created 5/12/21 by tj
// rev 0
//
//////////////////////////////////
//
// basic switch example file for class
//
// Grade range printer
//
//////////////////////////////////
#include "mbed.h"
#include <stdio.h>

int main(void){
    setbuf(stdout, NULL);   // fix for terminal issue

    // splash
    printf("\n\nswitch_class_ex_3 - example for EE2905\n");
    printf("Using Mbed OS version %d.%d.%d\n\n",
            MBED_MAJOR_VERSION, MBED_MINOR_VERSION, MBED_PATCH_VERSION);

    // local variables
    char grade;

    // generate an infinte loop
    while(1){
        // get starting value
        printf("\nPlease enter a letter grade : ");
        scanf(" %c", &grade);
```
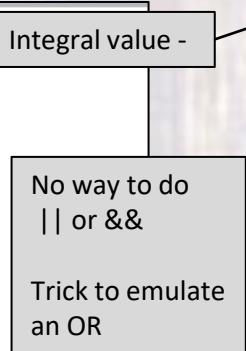
```
        // print grade
        switch(grade){
            case 'a':
            case 'A':
                printf("90 - 100\n");
                break;
            case 'b':
            case 'B':{
                printf("80 - 89\n");
                break;
            }
            case 'c':
            case 'C':
                printf("70 - 79\n");
                break;
            case 'd':
            case 'D':
                printf("60 - 69\n");
                break;
            case 'f':
            case 'F':
                printf("0 - 59\n");
                break;
            default:
                printf("Error\n");
                break;
        }// end switch
    }// end while

    return 0;
}// end main
```

Integral value -

{…} not required but allowed for clarity

No way to do || or &&

Trick to emulate an OR

```
switch_class_ex_3 - example for EE2905
Using Mbed OS version 6.10.0

Please enter a letter grade : b
80 - 89

Please enter a letter grade : B
80 - 89

Please enter a letter grade : D
60 - 69

Please enter a letter grade : g
Error
```