

Lab : Recursion

MyMath
+ Power(base : int, exp : int) : int + Sum(n : int) : int + Factorial(n : int) : int + Mod (val : int, divisor : int) : int

Implement the class MyMath as follows:

Power(base : int, exp : int) : int

- Recursively calculate the value of base to the power of exp, base^{exp} . Example: $\text{Power}(2,3) = 2*2*2 = 8$.

```
public int Power(int base, int exp){  
    if(exp == 0)  
        return 1;  
    return base * Power(base, exp-1);  
}
```

Sum(n : int) : int

- Recursively calculate the sum of all numbers between 0 and n. Example: $\text{Sum}(5) = 0+1+2+3+4+5 = 15$.

```
public int Sum(int n){  
    if(n==0)  
        return 0;  
    return n + Sum(n-1);  
}
```

Factorial(n : int) : int

- Recursively calculate the factorial of n, or n!. Example: $\text{Factorial}(5) = 1*2*3*4*5 = 1200$

```
public int factorial(int n) {  
    if(n == 1) {  
        return 1;  
    } else {  
        return n * factorial (n - 1);  
    }  
}
```

Mod (val : int, divisor : int) : int

- Recursively calculate the remainder of dividing val by the divisor. Example: Mod(8,3) = 2. Do not use %.

```
public int mod(int val, int divisor) {  
    if(val < divisor)  
        return val;  
    else  
        return mod(val - divisor, divisor);  
}
```