Design for Formula

If it takes input n, the output is:

(1 + x)^n = 1 + nC1*x^1 + nC2*x^2+ ... + nCr*x^r + ... + nCn*x^n

To calculate the factorials:
8! = 8 * (8 + 6 = 14) * (14 + 4 = 18) * (18 + 2 = 20) 8! = 8 * 14 * 18 * 20 and for odd numbers 9! = 9 * (9 + 7 = 16) * (16 + 5 = 21) * (21 + 3 = 24) * (roundUp(9/2) = 5) 9! = 9 * 16 * 21 * 24 * 5

The runtime of the Factorial function is n/2 or O(n).

Design of nCr

- returns the division of the numerator and denominator found by passing the args Factorial.

- runtime of nCr 3 * (n / 2 ) which is still O(n).

Runtime of Formula nCr

- n times in the main function so the overall runtime is O(n^2)

Space Usage Memory

- Space usage is O(n) because of the array that holds the coefficients.

Challenges

Since nCr and Factorial are in 32 bit assembly, the max factorial is 12!. Then, overflow conditions occur. An value higher than 12, will exit the program.