

Homework 3

Due: Thursday 1/22 at 11:59pm

Complete the following problem and submit it through Google Classroom (just the .asm file). For this problem, the name of the submitted file should be based on your name so it's uniquely yours (so mine could be dbunde.asm or davidb.asm).

1. (20 points) Write a MIPS assembly program that implements the function below to compute the Catalan numbers. (The n^{th} Catalan number C_n is the number of ways to parenthesize an expression with $n + 1$ items.) I suggest that you build on the “main function” code from lab.

```
int catalan(int n) {
    if(n == 0)
        return 1;

    int sum = 0;
    int i = 0;
    while(i < n) {
        int x = catalan(i);
        int y = catalan(n-1-i);
        int prod = x * y;
        sum = sum + prod;
        i++;
    }

    return sum;
}
```

For testing, here are some values of the Catalan numbers:

n	0	1	2	3	4	5
C_n	1	1	2	5	14	42

2. (1 point) At the top of your submission, put a statement about collaboration in a comment.