PORTFOLIO PROOFS D

Instructions. Choose one of the following statements and prove it (using induction). Use LaTeX to write your proof nicely. Drop your proof (both pdf and tex) in your OneDrive folder by the end of the day Wednesday, November 10.

1. Any two successive Fibonacci numbers are relatively prime (see definitions 1 and 2).

2. For every $n \in \mathbb{N}$, $(1 + 2 + 3 + \cdots + n)^2 = 1^3 + 2^3 + 3^3 + \cdots + n^3$.

Definition 1. Integers a and b are **relatively prime** if $\gcd(a, b) = 1$.

Definition 2. The Fibonacci sequence is defined recursively by $F_0 = 0$, $F_1 = 1$, and $F_{n+2} = F_{n+1} + F_n$ for any $n \in \mathbb{N}$. The beginning of the Fibonacci sequence is $0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, \ldots$.

Date: November 3, 2021.