Computational Number Theory
Programming HW 3

Due Date: 18/09/2022

Polynomials in $\mathbb{Z}_n[x]$

Write functions for each of the following; the input for each is two polynomials $f(x), g(x) \in \mathbb{Z}_n[x]$ and the output polynomials are also in $\mathbb{Z}_n[x]$. For 3,4,5, you may assume that n is prime.

1. Output: $f(x) + g(x)$
2. Output: $f(x) * g(x)$.
3. Output: $q(x), r(x)$ such that $f(x) = g(x)q(x) + r(x)$.
4. Output: $gcd(f(x), g(x))$.
5. Output: $u(x), v(x)$ such that $f(x)u(x) + g(x)v(x) = gcd(f(x), g(x))$.