A Review and a Preview

1^{st} Term: We discussed the following topics:

Topic	Main Tools (introduced/used)	Applications
Integers: $\mathbb{Z}$	Division Algorithm, Eucl. Algo., GCD, Unique Factorization	Linear Diophantine Equations
Modular Arithmetic: $\mathbb{F}_p$	Calculus of Remainders, Fermat's Theorem, Chinese Rem. Th.	Public Key Cryptography, Periodic Problems
Polynomials: $F[x]$	Complex Numbers Division Algorithm, Eucl. Algo., GCD, Unique Factorization Factoring Methods	Finding roots of polynomials

2^{nd} Term: We'll apply what we learned about polynomials to study methods involving matrices:

Topic	Main Tools (introduced/used)	Applications
Interpolation, Geometry and Approximation in $\mathbb{R}^n$	Polynomials, matrix methods, geometry of $\mathbb{R}^n$, Linear Algebra, least sq. method	Curve fitting, Approximation techniques
Matrix Poly's, Discrete Linear Systems	Polynomials, matrix methods: eigenvalues, etc., Jordan Can. Form	Discrete Linear Systems (Difference Equations)
Jordan Canonical Form	Poly's, eigenval.'s, factorization techniques	Matrix polynomials
Powers of matrices	Matrix polynomials	Stochastic matrices, Markov chains