Crib 8

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The crib sheet contains cheat-sheet worthy information but is not a substitute for lectures or for reading the notes. It also contains pointers and common mistakes.

1 Polynomials

- We have two important properties of polynomials:
  1. A polynomial of degree d is uniquely identified by $d+1$ points.
  2. A polynomial of degree d has at most d roots; it is uniquely identified by d roots and a leading coefficient.
- Because x can be 0 for a polynomial $p(x)$, we cannot apply $a^{p-1} \equiv 1 (\mod p)$ for some prime p, to polynomials.
- Lagrange interpolation works by finding all $\Delta_i = \frac{\Pi_j (x - x_j)}{\Pi_j (x_i - x_j)}$, then by $L(x) = \sum_i y_i \Delta_i$.

2 Error Correction

- We need $n + k$ packets to send across a channel that can lose up to k packets.
- We need $n + 2k$ packets to send across a channel that can corrupt up to k packets.