Practice Problems: Fast Fourier Transform

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Submit the solutions of the questions marked $(\star)$ in PDF format generated using Latex by **April 18, 2025**.

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1. **($\star$)** In the inverse DFT problem, we are given evaluation of a polynomial of degree at most n at every n-th root of unity. The goal is to find the coefficient representation of the polynomial. Design a $\mathcal{O}(n \log n)$ time algorithm for the problem.

2. **($\star$)** Design a $\mathcal{O}(n \log n)$ time algorithm to multiply two n bit integers.