Report for assignment 1

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Multiplying two very large numbers

1. **First step**

   We have to make the size a power of 2, since fft is only applicable for powers of 2.

   This can be obtained by running a loop till the number given is less than a power of 2.

2. **Second step**

   An inline formula: $\mathbf{F}(\mathbf{C}) = \mathbf{F}(\mathbf{A})\mathbf{F}(\mathbf{B})$.

   We can calculate the fft of A and B using the recursive fft function, by dividing the array into two parts even and odd, sinse their size is a power of 2, this will not be a problem.

3. **Third step**

   We multiply all the elements in both the arrays to get the third array. We can calculate the inverse fourier of the resultant array to get C.

Recurrence to characterise the running time The time required is in the form of $nlog(n)$.