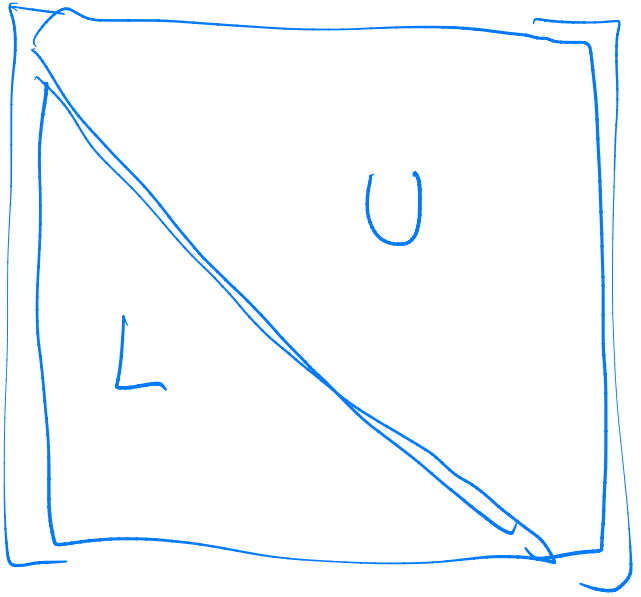
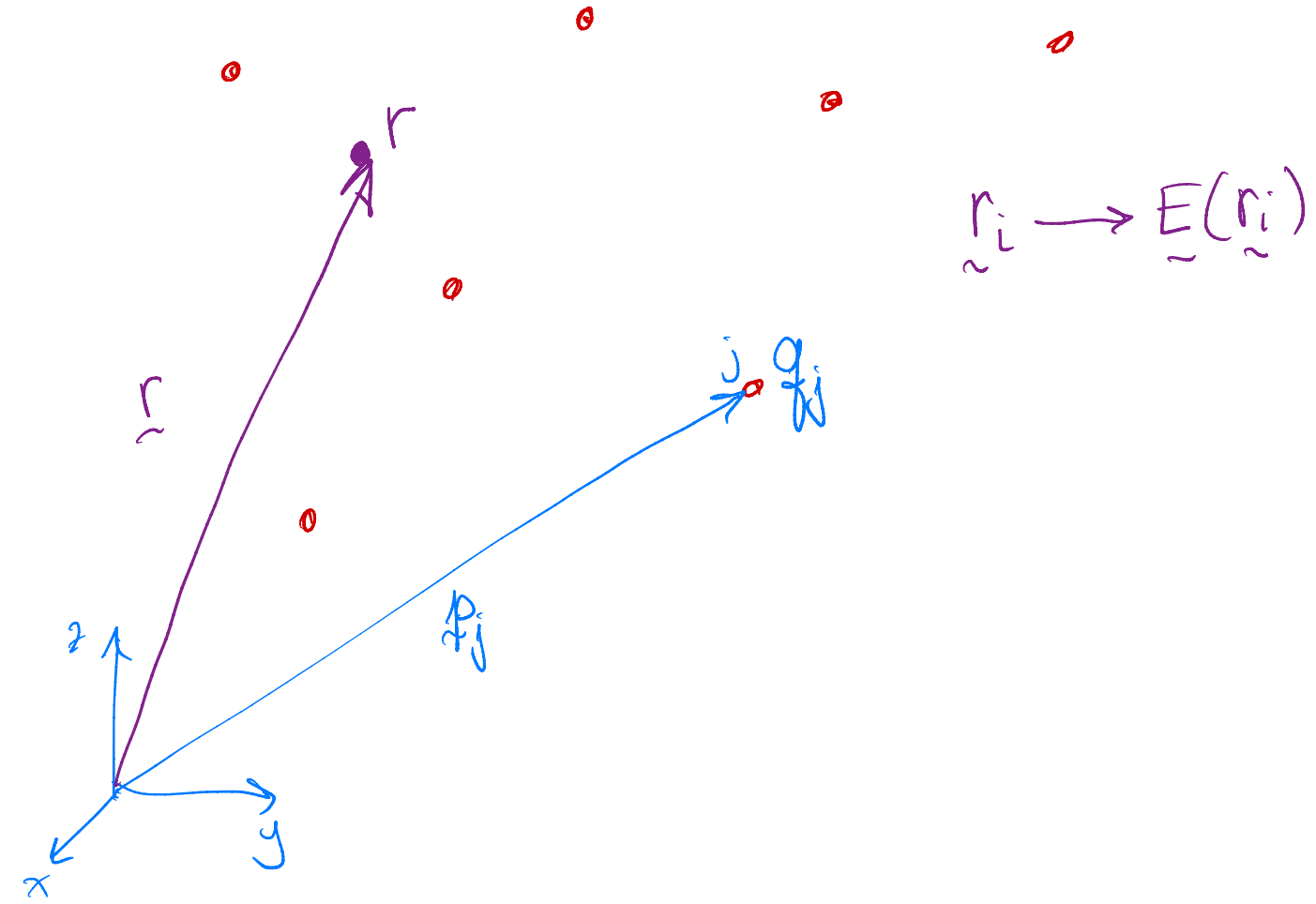
$M =$





$\underset{\sim}{r}_i \longrightarrow E(\underset{\sim}{r}_i)$

$\underset{\sim}{r}_1$: $E_x(\underset{\sim}{r}_1) = q_1 \dfrac{(x_1 - \bar{x}_1)}{\|\underset{\sim}{r}_1 - \underset{\sim}{\rho}_1\|^3} + q_2 \dfrac{(x_1 - \bar{x}_2)}{\|\underset{\sim}{r}_1 - \underset{\sim}{\rho}_2\|^3} + \cdots + q_N \dfrac{(x - \bar{x}_N)}{\|\underset{\sim}{r}_1 - \underset{\sim}{\rho}_N\|^3}$

$\underset{\sim}{r}_2$: $E_x(\underset{\sim}{r}_2) = q_1 \dfrac{(x_2 - \bar{x}_1)}{\|\underset{\sim}{r}_2 - \underset{\sim}{\rho}_1\|^3} + q_2 \dfrac{(x_2 - \bar{x}_2)}{\|r_2 - \rho_2\|^3} + \cdots + q_N \dfrac{(x_2 - \bar{x}_N)}{\|r_2 - \rho_N\|^3}$

$\vdots$

$\underset{\sim}{r}_N$: $E_x(\underset{\sim}{r}_N) = q_1 \dfrac{(x_N - \bar{x}_1)}{\|r_N - \rho_1\|^3} + q_2 \dfrac{(x_N - \bar{x}_2)}{\|r_N - \rho_2\|^3} + \cdots + q_N \dfrac{(x_N - \bar{x}_N)}{\|r_N - \rho_N\|^3}$

E field

$$\begin{bmatrix} E_x(r_1) \\ E_x(r_2) \\ \vdots \\ E_x(r_N) \end{bmatrix} = \begin{bmatrix} \frac{x_1 - \bar{x}_1}{\|r_1 - \rho_1\|^3} & \frac{x_1 - \bar{x}_2}{\|r_1 - \rho_2\|^3} & \cdots & \frac{x_1 - \bar{x}_N}{\|r_1 - \rho_N\|^3} \\ & & & \\ \frac{x_N - \bar{x}_1}{\|r_N - \rho_1\|^3} & & \cdots & \frac{x_N - \bar{x}_N}{\|r_N - \rho_N\|^3} \end{bmatrix} \begin{bmatrix} q_1 \\ q_2 \\ \vdots \\ q_N \end{bmatrix} = q$$

$$A_{ij} = \frac{x_i - \bar{x}_j}{\|\underset{\sim}{r}_i - \underset{\sim}{\rho}_j\|^3}$$

implement this!