$$\begin{aligned} \mathbf{r}_0 &= \mathbf{b} = \mathbf{A}\mathbf{x}_0 \\ i &= 0 \\ \end{aligned} \\ \end{aligned} \text{While } \|\mathbf{r}_i\| \leq TOL \\ \\ \boxed{\begin{aligned} i &= 0 \\ \\ \alpha_i &= 0 \end{aligned}} \\ & \alpha_i = \frac{\mathbf{r}_i^T \mathbf{r}_i}{\mathbf{r}_{i-1}^T \mathbf{r}_{i-1}} \\ & \mathbf{x}_{i+1} = \mathbf{x}_i + \alpha_i \mathbf{r}_i \\ & \mathbf{b}_{i+1} = \mathbf{b} - \mathbf{A}\mathbf{x}_{i_1} \end{aligned}} \\ \end{aligned} \\ \text{For } j &= 1, ..., i \\ \\ \boxed{\begin{aligned} \beta_i &= \frac{[[x_{i+1}, \mathbf{p}_i]]}{\mathbf{p}_i^T \mathbf{a} \mathbf{p}_i} \\ \\ \mathbf{p}_{i+1} &= \mathbf{x}_{i+1} - \beta_i \mathbf{p}_i \end{aligned}} \\ \mathbf{p}_{i+1} &= \mathbf{x}_{i+1} - \beta_i \mathbf{p}_i \end{aligned}} \\ \mathbf{P} &= \mathbf{I} - \mathbf{A}\mathbf{G}(\mathbf{G}^T \mathbf{A}\mathbf{G})^{-1} \mathbf{G}^T \end{aligned}}$$