In[1]:=
```
P = {{1, 0, 0, 0, 0, 0, 0, 0, 0}, {0, 1, 0, 0, 0, 0, 0, 0, 0}, {0, 0, 1, 0, 0, 0, 0, 0, 0},
    {0, 0, 0, 0, 0, 0, 1, 0, 0}, {0, 0, 0, 0, 0, 0, 0, 1, 0}, {0, 0, 0, 0, 0, 0, 0, 0, 1}};
MatrixForm[P]
q = {x0, y0, z0, x1, y1, z1, x2, y2, z2};
MatrixForm[q]
x = q - Transpose[P].P.q;
MatrixForm[x]
qhat = P.q;
MatrixForm[qhat]
MatrixForm[Transpose[P].qhat + x]
```

Out[2]//MatrixForm=

$$\begin{pmatrix} 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 \end{pmatrix}$$

Out[4]//MatrixForm=

$$\begin{pmatrix} x0 \\ y0 \\ z0 \\ x1 \\ y1 \\ z1 \\ x2 \\ y2 \\ z2 \end{pmatrix}$$

Out[6]//MatrixForm=

$$\begin{pmatrix} 0 \\ 0 \\ 0 \\ x1 \\ y1 \\ z1 \\ 0 \\ 0 \\ 0 \end{pmatrix}$$

Out[8]//MatrixForm=

$$\begin{pmatrix} x0 \\ y0 \\ z0 \\ x2 \\ y2 \\ z2 \end{pmatrix}$$

Out[9]//MatrixForm=

$$\begin{pmatrix} x0 \\ y0 \\ z0 \\ x1 \\ y1 \\ z1 \\ x2 \\ y2 \\ z2 \end{pmatrix}$$