Let $L \subset \mathbb{R}^3$ be a lattice with bases $\mathcal{B}_1 = \{\vec{\mathbf{v}}_1, \vec{\mathbf{v}}_2, \vec{\mathbf{v}}_3\}$ and $\mathcal{B}_2 = \{\vec{\mathbf{w}}_1, \vec{\mathbf{w}}_2, \vec{\mathbf{w}}_3\}$ where

$$\vec{\mathbf{v}}_1 = \langle 1, 3, 1\rangle \qquad \vec{\mathbf{w}}_1 = \langle 18, -5, -5\rangle$$
$$\vec{\mathbf{v}}_2 = \langle -2, 1, 1\rangle \qquad \vec{\mathbf{w}}_2 = \langle -59, -24, 2\rangle$$
$$\vec{\mathbf{v}}_3 = \langle 3, -2, -4\rangle \qquad \vec{\mathbf{w}}_3 = \langle -27, -8, 2\rangle$$

1. Verify that $\mathcal{B}_1$ and $\mathcal{B}_2$ are bases for the same lattice by placing $\mathcal{B}_1$ in the rows of a matrix A, $\mathcal{B}_2$ in the rows of a matrix B and verify that there is a matrix U with determinant ± 1 such that $UA = B$.
2. Compute the Hadamard Ratio for $\mathcal{B}_1$ and $\mathcal{B}_2$.
3. Use Babai's Algorithm to solve the CVP for $\vec{\mathbf{w}} = (13, -3, 7)$ using $\mathcal{B}_1$. Repeat using $\mathcal{B}_2$.
4. What is the value of $\|\vec{\mathbf{v}} - \vec{\mathbf{w}}\|$ for your answers from 3?