

$$A = \{\{2, I/\text{Sqrt}[2], 0\}, \{-I/\text{Sqrt}[2], 2, I/\text{Sqrt}[2]\}, \{0, -I/\text{Sqrt}[2], 2\}\}$$

$$\{\text{vals}, \text{vecs}\} = \text{Eigensystem}[A];$$

**vecs**

**vals**

$$\left\{ \left\{ 2, \frac{i}{\sqrt{2}}, 0 \right\}, \left\{ -\frac{i}{\sqrt{2}}, 2, \frac{i}{\sqrt{2}} \right\}, \left\{ 0, -\frac{i}{\sqrt{2}}, 2 \right\} \right\}$$

$$\left\{ \{-1, i\sqrt{2}, 1\}, \{1, 0, 1\}, \{-1, -i\sqrt{2}, 1\} \right\}$$

$$\{3, 2, 1\}$$

$$B = \{\{3, \text{Sqrt}[2], 0\}, \{\text{Sqrt}[2], 3, \text{Sqrt}[2]\}, \{0, \text{Sqrt}[2], 3\}\}$$

$$\{\text{vals}, \text{vecs}\} = \text{Eigensystem}[B];$$

**vecs**

**vals**

$$\left\{ \{3, \sqrt{2}, 0\}, \{\sqrt{2}, 3, \sqrt{2}\}, \{0, \sqrt{2}, 3\} \right\}$$

$$\left\{ \{1, \sqrt{2}, 1\}, \{-1, 0, 1\}, \{1, -\sqrt{2}, 1\} \right\}$$

$$\{5, 3, 1\}$$