6.5. the Gram-Schmidk Process.

• oIF basis oIK1 orthogonal basis들 만들기

Thm 293. V: IInP/F, $V = \text{sp}\{u_1, \dots, u_n\}$.

$$\hat{u}_1 = u_1$$

$$\hat{u}_2 = u_2 - \frac{\langle u_2, \hat{u}_1 \rangle}{\langle \hat{u}_1, \hat{u}_1 \rangle} \hat{u}_1$$

$$\hat{u}_3 = u_3 - \left(\frac{\langle u_3, \hat{u}_1 \rangle}{\langle \hat{u}_1, \hat{u}_1 \rangle} \hat{u}_1 + \frac{\langle u_3, \hat{u}_2 \rangle}{\langle \hat{u}_2, \hat{u}_2 \rangle} \hat{u}_2 \right)$$

$$\vdots$$

$$\hat{u}_n = \sim.$$

$\text{proj}_{\hat{u}_1} u_2$

$$\text{proj}_{\hat{u}_1} u_2 = \alpha \hat{u}_1.$$

$$\langle u_2 - \alpha \hat{u}_1, \hat{u}_1 \rangle = 0.$$

$$\Rightarrow \alpha = \frac{\langle u_2, \hat{u}_1 \rangle}{\langle \hat{u}_1, \hat{u}_1 \rangle}$$

G-S process.

$\{\hat{u}_1, \dots, \hat{u}_n\}$ orthogonal basis.

HW: example 294, 296, 297.