Math 4321 Example 1

$F = \mathbb{Q}$, $K = \mathbb{Q}(\sqrt{2}, \sqrt{3})$ has basis $\{1, \sqrt{2}, \sqrt{3}, \sqrt{6}\}$

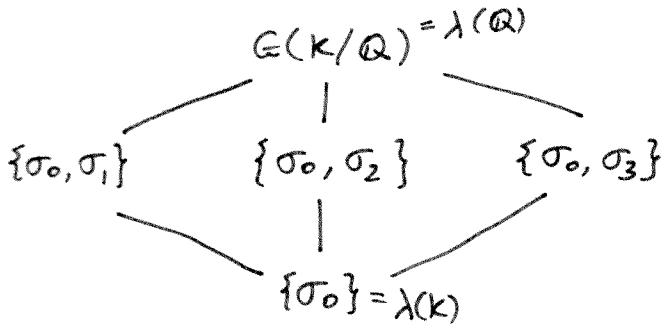
$G(K/\mathbb{Q}) = \{\sigma_0 = id, \sigma_1, \sigma_2, \sigma_3\} \cong \mathbb{Z}_2 \times \mathbb{Z}_2$

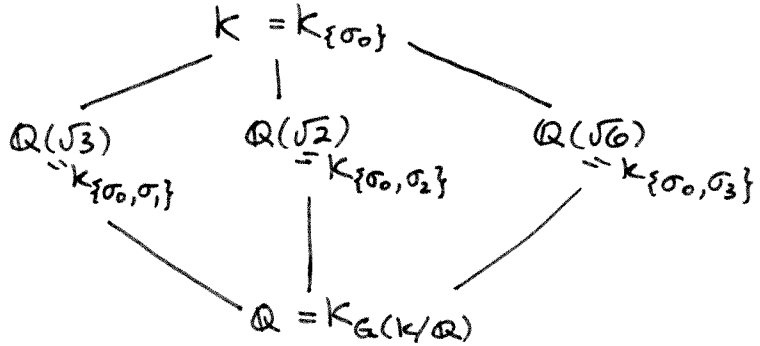
$\sigma_1 : 1 \mapsto 1$, $\sqrt{2} \mapsto -\sqrt{2}$, $\sqrt{3} \mapsto \sqrt{3}$, $\sqrt{6} \mapsto -\sqrt{6}$

$\sigma_2 : 1 \mapsto 1$, $\sqrt{2} \mapsto \sqrt{2}$, $\sqrt{3} \mapsto -\sqrt{3}$, $\sqrt{6} \mapsto -\sqrt{6}$

$\sigma_3 : 1 \mapsto 1$, $\sqrt{2} \mapsto -\sqrt{2}$, $\sqrt{3} \mapsto -\sqrt{3}$, $\sqrt{6} \mapsto \sqrt{6}$

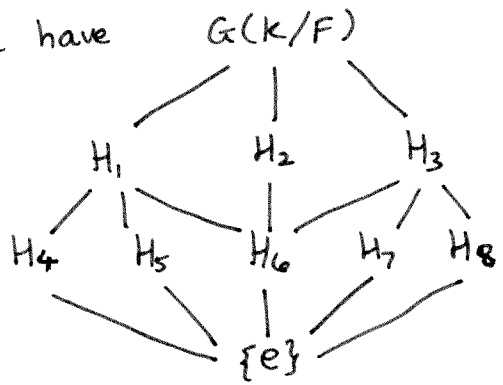
$\lambda(\mathbb{Q}) = G(K/\mathbb{Q})$, $\lambda(\mathbb{Q}(\sqrt{2})) = \{\sigma_0, \sigma_2\}$, $\lambda(\mathbb{Q}(\sqrt{3})) = \{\sigma_0, \sigma_1\}$, $\lambda(\mathbb{Q}(\sqrt{6})) = \{\sigma_0, \sigma_3\}$, $\lambda(K) = \{\sigma_0\}$



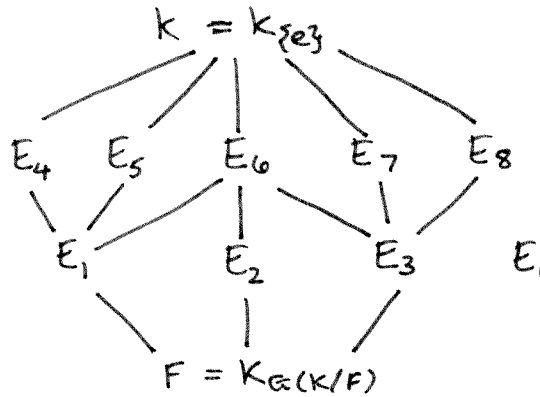


Example 2

If we have



then have



$E_i = K_{H_i}$ $\forall i$