

## 1 | Axler6.53 orthogonal projection, $\mathcal{P}_U$ def

Suppose  $U$  is a finite-dimensional subspace of  $V$ . The *orthogonal projection* of  $V$  onto  $U$  is the operator  $P_U \in \mathcal{L}(V)$  defined as follows:

For  $v \in V$ , write  $v = u + w$ , where  $u \in U$  and  $w \in U^\perp$ . Then  $P_U v = u$ .