

## Exercises on projections onto subspaces

**Problem 15.1:** (4.2 #13. *Introduction to Linear Algebra*: Strang) Suppose  $A$  is the four by four identity matrix with its last column removed;  $A$  is four by three. Project  $\mathbf{b} = (1, 2, 3, 4)$  onto the column space of  $A$ . What shape is the projection matrix  $P$  and what is  $P$ ?

**Problem 15.2:** (4.2 #17.) If  $P^2 = P$ , show that  $(I - P)^2 = I - P$ . For the matrices  $A$  and  $P$  from the previous question,  $P$  projects onto the column space of  $A$  and  $I - P$  projects onto the \_\_\_\_\_.

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