**ABSTRACT.** Let \( \{G_k\} \) be a sequence of linear subspaces of a normed linear space \( E \). We want to characterize those sequences \( \{g_k\} \) in \( E \), with \( g_k \in G_k \) \((k = 1, 2, \ldots)\), for which there exists an \( x \in E \) such that

\[
g_k \in P_{G_k}(x) \quad (k = 1, 2, \ldots),
\]

where \( P_G(x) \) denotes the set of all elements of best approximation to \( x \) from \( G \), i.e., the set

\[
\{g_0 \in G \mid ||x - g_0|| = \inf_{g \in G} ||x - g||\}.
\]

This general study was motivated by a problem posed by T.J. Rivlin [5] who asked: Characterize (intrinsically) those \( n \)-tuples of polynomials \((p_0, p_1, \ldots, p_{n-1})\), with degree of \( p_j \) equal to \( j \) for all \( j \), for which there exists an \( x \in C[0, 1] \) such that the polynomial of best approximation to \( x \), from the space of polynomials \( P_j \) of degree at most \( j \), \( \Pi_{P_j}(x) \), is \( p_j \) \((j = 0, 1, \ldots, n - 1)\). What is the answer in the particular case where \( n = 2 \)?

We can give a complete (but not intrinsic) characterization of our general problem (Theorem 1). This allows us, for example, to get a complete characterization of the general problem in a Hilbert space when the subspaces \( G_k \) are increasing (Theorem 5), or when they are decreasing (Theorem 6). In \( C[0, 1] \), we answer Rivlin's second question as follows. Given \( p_j \in P_j \((j = 0, 1)\), there exists \( x \in C[0, 1] \) such that \( \Pi_{P_j}(x) = p_j \) \((j = 0, 1)\) if and only if \( p_1 - p_0 \) is either identically zero or changes sign once in \([0, 1]\).