# Assignment 1

Shubham Shrivastava

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**Question 1:** If A,B are symmetric matrices of same order,then AB-BA is a
(A) Skew symmetric matrix
(B) Symmetric matrix
(C) Zero matrix
(D) Identity matrix
**Solution:**
**G**iven, A and B are symmetric matrices, therefore, we have:

$$A' = A \qquad and \qquad B' = B \tag{1}$$

consider

$$=> \quad (AB - BA)' = (AB)' - (BA)' \qquad [(A - B)' = A' - B' ]$$
$$=> \quad (AB - BA)' = B'A' - A'B' \qquad [(AB)' = B'A' ]$$
$$=> \quad (AB - BA)' = BA - A$$
$$=> \quad (AB - BA)' = -(AB - BA)$$

Thus, $(AB - BA)$ is a skew symmetric matrix.