Step-1

If the columns of a 4 by 4 matrix have lengths L_1, L_2, L_3, L_4 the largest possible value of the determinant, is the largest possible volume when the lengths of its edges are given. The largest possible volume is obtained only when the edges are mutually orthogonal and hence we note that the largest possible value of determinant 4×4 whose column lengths are $L_1, L_2, L_3, L_4 = L_1.L_2.L_3.L_4$.

Step-2

When all the entries are 1 or â€“1, each length is equal to $\sqrt{1+1+1+1} = 2$ and hence maximum determinant is $2^4 = 16$ units.