3. As the figure shows, a bolted lap joint is used to connect two steel cables with flat plate ends. The joint consists of two identical cold-drawn steel plates and two identical bolts. The tension in the joint is distributed with $P \sim N(8, 0.8^2)$ kips. The yield strength of the members and the bolts are distributed normally as well with parameter $M \sim N(60, 6^2)$ kpsi and $B \sim N(200, 8^2)$ kpsi, respectively. If all the random variables are independent, use MCS to find the probability of failure of the joint based on a) member bearing failure, b) member tensile yielding, c) bolt shearing failure and d) bolt bearing failure.

Answer: a) $p_f = 1.322(10^{-1})$; b) $p_f = 0$; c) $p_f = 1.459(10^{-4})$; d) $p_f = 0$