3. (6 marks) Suppose a researcher is studying the preferences of customers regarding two types of smartphones, iPhone (I) and Android (A), based on their age groups, young (Y) and middle-aged (M). According to survey data, the probabilities of the four possible preferences are $\alpha\beta$ for IY, $\alpha(1-\beta)$ for IM, $(1-\alpha)\beta$ for AY, and $(1-\alpha)(1-\beta)$ for AM, where α represents the probability of preferring iPhone, and β represents the probability of being at the young age group. These preferences are independent of each other.

   The following table shows the observed frequencies of the four preference types among 200 surveyed individuals:

Preference Type	IY	IM	AY	AM
Observed Frequency	100	50	40	10

   Find the joint Maximum Likelihood Estimates (MLE) of (α, β) and compute the estimated expected frequencies for each preference type under the given model.
   You do not need to show the second derivative conditions for this exercise.