The 4x4 spin 1/2 representation in electron polarization in a magnetic field KESHAV SHRIVASTAVA, University of Hyderabad — We introduce a 4x4 spin representation for spin 1/2. There are two spin orientations for a given value of $g_+$ and two for $g_-$ which arise for two signs of spin. This theory produces factors which affect the product $m^*g^*$ so that if these factors are not taken into account, much larger values of the electron mass than those of the electron mass in a band arise. This predicted phenomenon is in accord with the experimental data. Similarly we find that factors arise in cyclotron frequency which affect the magnetoresistance and hence the $g$ values. Accordingly, large $g$ values are measured in the experimental data. When our factors are taken into account, the $g$ values compare well with band values. The $g^* = g_+ - \delta$ describes the shift due to many-body interactions.