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Explaining $(g - 2)_e$ and $(g - 2)_\mu$ together naturally

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The anomalous magnetic moments of the electron and the muon hint at lepton-nonuniversality from physics beyond the Standard Model (SM). We propose a natural explanation in the framework of an asymptotically safe SM, with an extended scalar sector and Yukawa couplings between vector-like fermions and ordinary leptons, which links flavor to new physics. Both leptons' magnetic moments are induced at 1-loop, with the difference in size and sign of their respective deviations from the SM driven by a flavorful vacuum. Two concrete models are presented, one in which the BSM fermions are charged under $SU(3)_C \times SU(2)_L \times U(1)_Y$ as the SM singlet leptons, and one as the SM doublet leptons. The models are stable and predictive up to the Planck scale and beyond and can be searched for at hadron and lepton colliders.

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