New Iterative Calculation of American-style Derivatives-A Lower Approximation of the Snell Envelope

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Abstract: I present an iterative procedure for computing the lower approximation of the Snell envelope - a value process of the American option. The method produces an increasing sequence of approximations of the Snell envelope from below, which coincide with the Snell envelope in discrete time after finite steps. Advantages of this method compared with other well-known traditional approaches will be discussed first. Then, I will elaborate the algorithm details associated with theoretical proofs. An example of constructing the lower approximation is available with numerical results, which are demonstrated in figures. Some characteristics of the implementation in the computational environment and an improvement are mentioned at the end.