FIT2102 Assignment 2 Report (Twenty-One)

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The design of the code started off with a custom memory data-structure, that is a record-syntax style **GameMemory** that stores information of previous bids, previous actions, rank, win streak, true count, current count, cards seen and current cards seen, which can then be serialized and deserialized such that we can use these information to enable card-counting strategies to play the game. With each call of playFunc, the code design follows the cycle below, and this design makes it easy to keep track of memory flow across game iterations.

Card-counting strategies rely on finding the true count of the decks by using a system known as the Hi-Lo count, by taking the running count and dividing it by the number of decks left, which is why it is necessary to keep track of the information of cards seen and true count in memory. A positive count indicates that my *player should bet more* (specifically minBid \* trueCount), and a negative/zero count will have my *player betting minimum*. The function **convertCardToCount** makes the value of a card rank clear when card counting. However when it comes to selecting actions, a lookup table was implemented in order to search for an action based on basic strategy, which is a selection of actions to do for a specific dealer up card and player hand combination, the search is done by **basicStrategyHardTotal, lookupQ** and **determineTable**. Implementing a lookup table is necessary to improve strategy maintenance and shortening guard conditions.

The BNF grammar used for the memory parser is in the form of…

<gameMemory> ::= <previousBids> | <previousActions> | <ranking> | <winStreak> | <trueCount> | <currCount> | <cardsSeen> | <currCardsSeen>

<previousBids> :: <number> “|”

<previousActions> :: <actions> “|”

<ranking> :: <number> “|”

<winStreak> :: <number> “|”

<trueCount> :: <number> “|”

<currCount> :: <number> “|”

<cardsSeen> :: <number> “|”