COMS 4701 Artificial Intelligence
Sec 01

HW 4

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Question 1: Sudoku

1. **List the names of the variables in the blue circle and their corresponding initial value domains.**
   Format: variable name(V): domains(D)
   A4:[1, 2, 3, 4, 5, 6, 7, 8, 9]
   A5:[2]
   A6: [1, 2, 3, 4, 5, 6, 7, 8, 9]
   B4:[3]
   B5: [1, 2, 3, 4, 5, 6, 7, 8, 9]
   B6:[5]
   C4:[8]
   C5: [1, 2, 3, 4, 5, 6, 7, 8, 9]
   C6:[6]
2. **List the new domains after enforce arc constraints using the entire puzzle board.**
   Format: variable name(V): domains(D)
   A4:[4, 9]
   A5:[2]
   A6:[1, 4, 7]
   B4:[3]
   B5:[4, 7]
   B6:[5]
   C4:[8]
   C5:[7, 9]
   C6:[6]

3. **Use MRV to choose next value to explore**
   Since A4, B5, C5 both have two values, A6 has three value, use minimum remaining value heuristic, we can choose **A4, B5, C5**
4. **Assume we choose A4 to explore next and assume that A6, B5, C5 are the last three remaining variables waiting to be assigned. Using least constraining value rule, which value of A4 should be tried first?**

   If assign A4 = 4:
   A6:[1, 7] B5:[7] C5:[7, 9]

   If assign A4 = 9:
   A6:[1, 4, 7] B5:[4, 7] C5:[7]

   Since when A4 = 9 rules out the fewest values in the remaining variables, **A4 = 9 should be choose first.**