KRR Assignement 1 | Sudoku

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A) Representation chosen :-

I have a state name sudoku which has 81 boxes (indentifiers). Each box has a following attributes:

1)value = value present in the box
2) row = in which row the box is present
3) coloumn = in which column the box is present
4)block(size = 3x3) = in which block the box is present

If box is emty(value is zero) then it has additional following attributes:
5) possible = set of possible values can be put in a box. Initially it has 9 numbers(1 2 3 4 5 6 7 8 9)
6) pcount = number of possible numbers in possible set. Initially pcount is 9.

B) Structure and Content of rules

I have implemented a following rules to solve the sudoku.

1) Elimination rule

Select up a empty box and choose one number n from 'possible' set. If number n is present in either row or column or block as a value then remove n from 'possible' set of selected box.

This rule is implented in forms of 3 different rules.
a) firstrule(for row)
b) secondrule(for column)
c) thirdrule (for block)

2) Only square / hidden single rule

This rule is implented in forms of 3 different rules.
a) onlysqurow – for a particular row, out of all possible sets if a particular number occurs in only one possible set of a box then insert that number in that box.
b) onlysqucolumn - for a particular column, out of all possible sets if a particular number occurs in only one possible set of a box then insert that number in that box.
c) onlysqublock - for a particular block, out of all possible sets if a particular number occurs in only one possible set of a box then insert that number in that box.

3) Naked twin

This rule is implented in forms of 3 different rules.

a) nakedtwinrow- for a particular row, if two boxes has a pcount 2 and has same two possible numbers(n1,n2) then if n1 or n2 occurs in any other possible set of box (in same row) then remove the occured number from possible set.

b) nakedtwincolumn- for a particular column, if two boxes has a pcount 2 and has same two possible numbers(n1,n2) then if n1 or n2 occurs in any other possible set of box (in same column) then remove the occured number from possible set.

c) nakedtwinblk- for a particular block, if two boxes has a pcount 2 and has same two possible numbers(n1,n2) then if n1 or n2 occurs in any other possible set of box (in same block) then remove the occured number from possible set.

4) Hidden twin

To spot a Hidden Twin you need to find two numbers(n1,n2) that can only be placed in the same two boxes. If you spot a hidden twin in box1 and box2 then remove all other possible numbers (other than n1 and n2) from possible set of box1 and box2.