First: read and store

1. read value from the input .txt file

2. detect the illegal values and change those values to 0

3. store all the corrected value in a 2d array

Second: run and write the real data into a file

1. read all index values in the table

2. transform those values into base 9

3. write the transformed data into the .txt file

4. each value ends with 0

Third: at least one number in each entry

1. for 1 <= i,j,k <= 9, generate 3-digit numbers in the format of ijk (or (i,j,k))

2. transform the base-9 number ijk into a decimal by calling self-defined method toDecimal();

3. write the value of the new base-9 number into the .txt file

4. each value ends with 0

Fourth:Each number appears at most once in each row

i(1,9) \* k(1,9) \* j(1,8) \* d(j+1, 9)

These for loops will create a column view for cnf:

1. keep i, k going from 1 to 9, and j going from 1 to 8

2. transform (i,j,k) and (i,j+1,k) into decimal

3. write the decimals into .txt file

4. each line ends with 0

Fifth: Each number appears at most once in each column

i(1,9) \* k(1,9) \* j(1,8) \* d(j+1, 9)

These for loops will create a column view for cnf:

1. keep i, k going from 1 to 9, and j going from 1 to 8

2. transform (i,j,k) and (i,j+1,k) into decimal

3. write the decimals into .txt file

4. each line ends with 0

Sixth: Each number appears at most once in each 3x3 sub-grid:

k(1,9) \* Xstart(1,3) \* Ystart(1,3) \* i(1,4) \* j(1,4) \* n(j+1, 4)

k(1,9) \* Xstart(1,3) \* Ystart(1,3) \* i(1,4) \* j(1,4) \* n(j+1, 4) \* m(1,3)

These for loops will create a 3x3 box view for cnf:

1. keep k going from 1 to 9

2. transform every two base-9 number, which in the same row, into decimal

3. transform every two base-9 number, which in the coner side, into decimal

4. write the decimals into .txt file

5. each line ends with 0

Lastly: convert it:

1. transfer the (j,i,k) into decimal, is convertable

2. get the value in the array with that decimal index

3. write the result for every line