Project 4
Name: Kitty Zhuang and Josh Zhang
Instructor: S. Einakian
Section: CPE101_01

Team Member Responsibility:
Kitty

1. Discuss and write pseudocode
2. Write function validate_cages, transpose, validate_all
3. Write tests
4. Write main Calcudoku solver
5. Test the solver

Josh

1. Discuss and write pseudocode
2. Write function validate_cages, validate_col, validate_row
3. Write tests
4. Write main Calcudoku solver
5. Test the solver

Main Pseudocode:

1. Obtain the number of cages:
2. Prompt the user to input the requirements for each cage (# of prompt = # of cages)
3. Make the cage condition to a list of lists.
4. Make a list of 25 zeros called grid
5. Create a while loop that increases each item in the grid by 1 untill it meet the validifications.
6. If the number is invalid, set the number to zero and go back to the privous number
7. If the grid is valid, print the grid as a 5 by 5 matrix.

Functions Pseudocode:

1. validate_cages(grid, cages)
    a. Create an empty sum_list and a list for all the required sums.
    b. Create a for loop to check per item in the cages
    c. Create a new list by slicing the item to exclude the 0th number.
    d. The new list is the index for the numbers in the grid, sum up the numbers in the grid and check if the sum equals to or less than the 0th number of the cage.
    e. Return false if the sum is larger than the required sum when the grid is partially or if the sum does not equal to the required sum when the grid is fully populated.

    f. Return true otherwise.

2. validate_rows(grid):
    a. Create a for loop to check every row in the grid
    b. If there is a duplicate in every row, the function returns True
    c. If there are no duplicates in any rows, it returns True

3. transpose(grid):
    a. Create a new list of 25 zeros
    b. Create a for loop
    c. Use the original index to find it's a row and col value, and calculate the new index.
    d. Use the new index value to assign the new list a number from the grid.
    e. Return new list

4. validate_cols(grid):
    a. Assign the output of transpose(grid) to new_grid
    b. Use validate_rows and new_grid as input

5. validate _all(grid,cages):
    a. Check all the validate_cages,validate_rows and validate_cols equality relationship.
    b. Returns true if all validations returns true
    c. Returns false if all validations returns false