How to convert from a continuous scale to discrete scale with fixed number of bins?
- We want to start with cards placed in any order with edges of the cards unaligned
- There needs to be a reference point on the board (could be invisible to the user) to keep track of the position of the cards (0,0) coordinate
- Cards position will be store relative to this reference point in (x,y) coordinate of natural negative and positive numbers
  - Implies that there's an underlying grid
  - Cards center point OR bottom left corner can be the reference point for each card

Components:
- Cards (discrete units with fixed size)
- Scale (series of bins with names)
- Grid (Cartesian coordinate system)

Known Variables:
- Size of each card (in pixels)
- Range from first card (farthest left) to last card (farthest to the right)
- The number of bins in the scale
- The "name" of each bin on the scale

There are different approaches to scaling. Each has pros and cons. There are use cases for both.

**Scales with variable size bins:**
- Size of each bin (in pixels) can be set according to the first bin in the series and the last bin the series selected
  - Example : scale [ xxs, xs, s, m, l, xl, xl, xxl ] has 8 bins with the names listed here
  - User wants to set the range of the bin from [xs] to [xl]
    - Now scale is  [ xs, s, m, l, xl, xl ] with 6 bins
- The range of the card arrangement is calculated based on the farthest left and farthest right cards
  - Example: farthest left (- 100, 0) and farthest right ( 200, 0)
    - Range would be 300
  - Divide the range by the number of bins to get size of each bin
    - 300/6 = 50
    - Each bin would be represented by 50 pixels (or whatever units)
- Apply the scale to the screen and sort cards into the bins
  - Cards with x coordinates between (-100) and (-50) will be bin named *xs* ...and so forth

**Scale with fixed size bins:**
- Size of the bins is set according to the size of cards which are already discrete units
  - Let say the cards are 20 pixels each and we arbitrarily decide that the bins will have a 5pixel margins on each side of the card

- - - Each bin will have a size of 30 pixels
    - Scale [ xxs, xs, s, m, l, xl, xl, xxl ] has 8 bins with the names listed here
    - User wants to set the range of the bin from [xs] to [xl]
      - Now scale is  [ xs, s, m, l, xl, xl ] with 6 bins
- The range of the card arrangement is calculated based on the farthest left and farthest right cards
  - Example: farthest left (- 100, 0) and farthest right ( 200, 0)
    - Range would be 300
- Apply the scale to the screen and sort cards into the bins
  - There are 6 bins with 30 pixels each
    - This scale only covers a maximum of 180 pixels
    - BUT THE CARD RANGE IS 300 pixels
    - PROGRAM WARNS USER THIS IS NOT POSSIBLE
    - User has to reset the first and last bin of this scale and/or choose a different scale