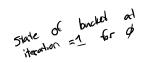# 2019-12-05 Radix Sort

Thursday, December 5, 2019   9:41 AM

- Radix sort is a non-generalizable sorting algorithm
    - This sort doesn't work on all types of comparable data
    - Instead, it only works on data that can be broken down into positional elements
        - E.g. "dog" -> "d" "o" "g"
        - 192 -> 1...9...2
- Create N buckets where N is based on the number of possible values for each positional element
    - E.g. numbers have positional values 0...9
    - E.g. letters have positional values a..z
- Example Radix Grid

State of bucket at iteration =1 for ∅

	0s place (1st iteration)	10s place	100s	
0		204, 305, 309	12, 37, 99	
1		112, 12, 417	112	
2	112, 12, 432	224	204, 224, 295	
3	593	432, 37	305, 309	
4	224, 204,		417, 432	
5	295, 305		593	
6				
7	37, 417			
8				
9	99, 309	593, 295, 99		

Staring with the "least significant" value (e.g. 0s place in decimal or last letter in string) and moving towards the most significant value...
- Put the data item under consideration into the appropriate bucket based on the positional value under consideration
- Do this until all items have had all positional values considered
- For each iteration, numbers are considered in bucket order based on insertion order

Example Sort:
[99, 37, 112, 224, 295, 305, 417, 12, 593, 204, 432, 309]

Efficiency is O(N*M) where M = Log10(max value)