

1. Import files
2. Set column names to lowercase
3. Filter r\_code values
4. Column renaming
5. Examine 'type' column
6. Narrow down application type to 1 and 2
7. Convert datetimes to all be the same format
8. Fill in missing in award\_notice\_date with budget\_start
9. Check for NAs, etc.
10. Fill in with 'Missing'
11. Fill with 0
12. Columns to delete
13. Drop NA
14. Check for missing values again
15. Get to know data
16. Change id, type and fy to string
17. Clean up the list of TRA research project code by removing hyphen
18. Set TRA to corresponding R codes. TRA is breakthrough, but because they apply under R01, have to separate the R01 that are actually breakthrough
19. Map the categories to the research projects
20. Make sure that budget year is greater or equal to 2000 and same with award\_notice\_date can be 2019 if budget year is 2000
21. Check for duplicates on 'full\_project\_num' and 'project\_title'
22. Delete duplicates on 'full\_project\_num'
23. Make ic\_name title case
24. Get a list of unique ic\_name column
25. Check for near matches to clean up/merge
26. Change ampersand to word 'and' and correct for spacing
27. Check on unique values in ic\_name again
28. Further clean up ic\_names
29. Map/collapse nearly matching ic\_names
30. Get combined length of years and months under combined\_length\_of\_time
31. Turn combined\_length\_of\_time to only months instead of years, months
32. Per r\_code\_category count
33. Concatenate all of the original cleaned dfs
34. Count of individual r\_code
35. Concatenate r\_code\_category
36. Get average of r\_code\_category per group of years
37. Get total counts for r\_code\_category 2000-10, 2011-21, and 22
38. Make first packed bubble chart with proportional radii
39. Generate packed circles for 2011-2021 second bubble chart
40. Generate packed bubble circles for viz 22022
41. Generate circular barplot
42. Generated median project length for each r\_code\_category

43. Get number of projects based on r\_code\_category's project lengths
44. Double check number per r\_code\_category against total per r\_code\_category
45. Get percentage per r\_code\_category per project length
46. Make quadrant plot