Exploring categorical data

EXPLORATORY DATA ANALYSIS IN R

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datacamp

Comics dataset

```
comics
```

```
# A tibble: 23,272 x 11
                                    name               id   align
                                  <fctr>           <fctr>  <fctr>
1              Spider-Man (Peter Parker)  Secret Identity    Good
2        Captain America (Steven Rogers)  Public Identity    Good
3  Wolverine (James \\"Logan\\" Howlett)  Public Identity Neutral
4    Iron Man (Anthony \\"Tony\\" Stark)  Public Identity    Good
5                     Thor (Thor Odinson) No Dual Identity    Good
6             Benjamin Grimm (Earth-616)  Public Identity    Good
7              Reed Richards (Earth-616)  Public Identity    Good
8             Hulk (Robert Bruce Banner)  Public Identity    Good
9              Scott Summers (Earth-616)  Public Identity Neutral
10            Jonathan Storm (Earth-616)  Public Identity    Good
# ... with 23,262 more rows, and 8 more variables: eye <fctr>,
#   hair <fctr>, gender <fctr>, gsm <fctr>, alive <fctr>,
#   appearances <int>, first_appear <fctr>, publisher <fctr>
```

Working with factors

```
levels(comics$align)
```

```
"Bad"                 "Good"                "Neutral"
"Reformed Criminals"
```

```
levels(comics$id)
```

```
"No Dual" "Public"  "Secret"  "Unknown"  # Note: NAs ignored by levels() function
```

```
table(comics$id, comics$align)
```

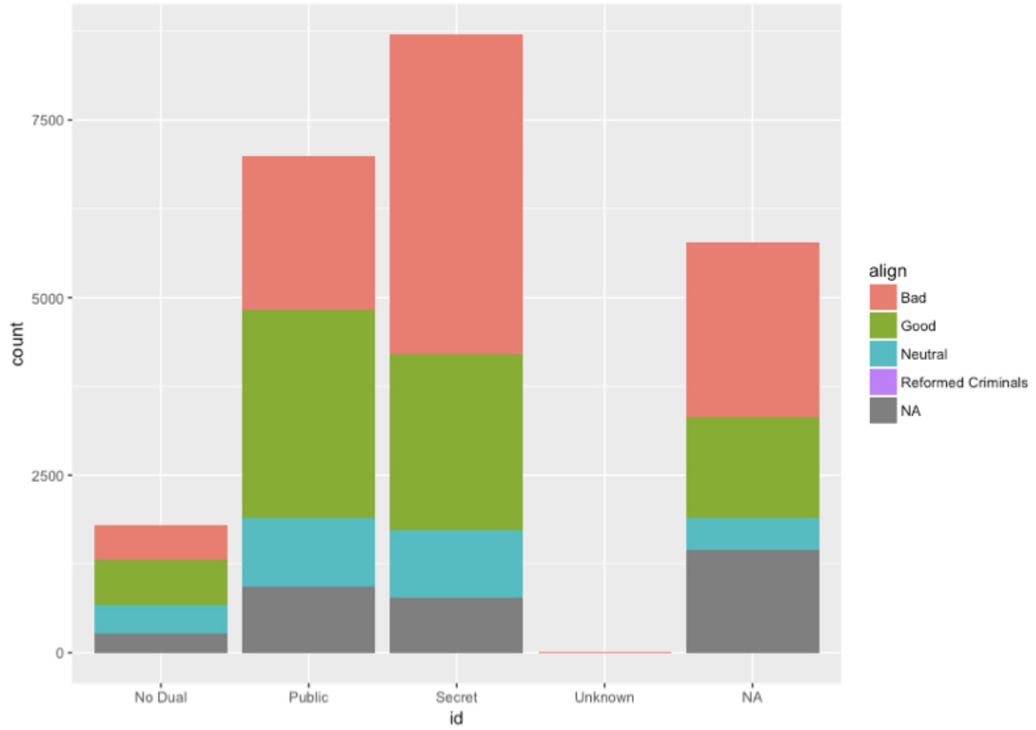
```
         Bad Good Neutral Reformed Criminals
No Dual  474  647     390                 0
Public  2172 2930     965                 1
Secret  4493 2475     959                 1
Unknown    7    0       2                 0
```

```
ggplot(data, aes(x = var1, fill = var2)) +
  layer_name()
```

```
ggplot(comics, aes(x = id, fill = align)) +
  geom_bar()
```

Bar chart

```
library(ggplot2) # Load package
ggplot(comics, aes(x = id, fill = align)) +
    geom_bar()
```



Let's practice!

EXPLORATORY DATA ANALYSIS IN R

Counts vs. proportions

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From counts to proportions

```
options(scipen = 999, digits = 3) # Simplify display format
tab_cnt <- table(comics$id, comics$align)
tab_cnt
```

```
           Bad Good Neutral
  No Dual  474  647     390
  Public  2172 2930     965
  Secret  4493 2475     959
  Unknown    7    0       2
```

```
prop.table(tab_cnt)
```

```
               Bad     Good  Neutral
  No Dual 0.030553 0.041704 0.025139
  Public  0.140003 0.188862 0.062202
  Secret  0.289609 0.159533 0.061815
  Unknown 0.000451 0.000000 0.000129
```

```
sum(prop.table(tab_cnt))
```

```
1
```

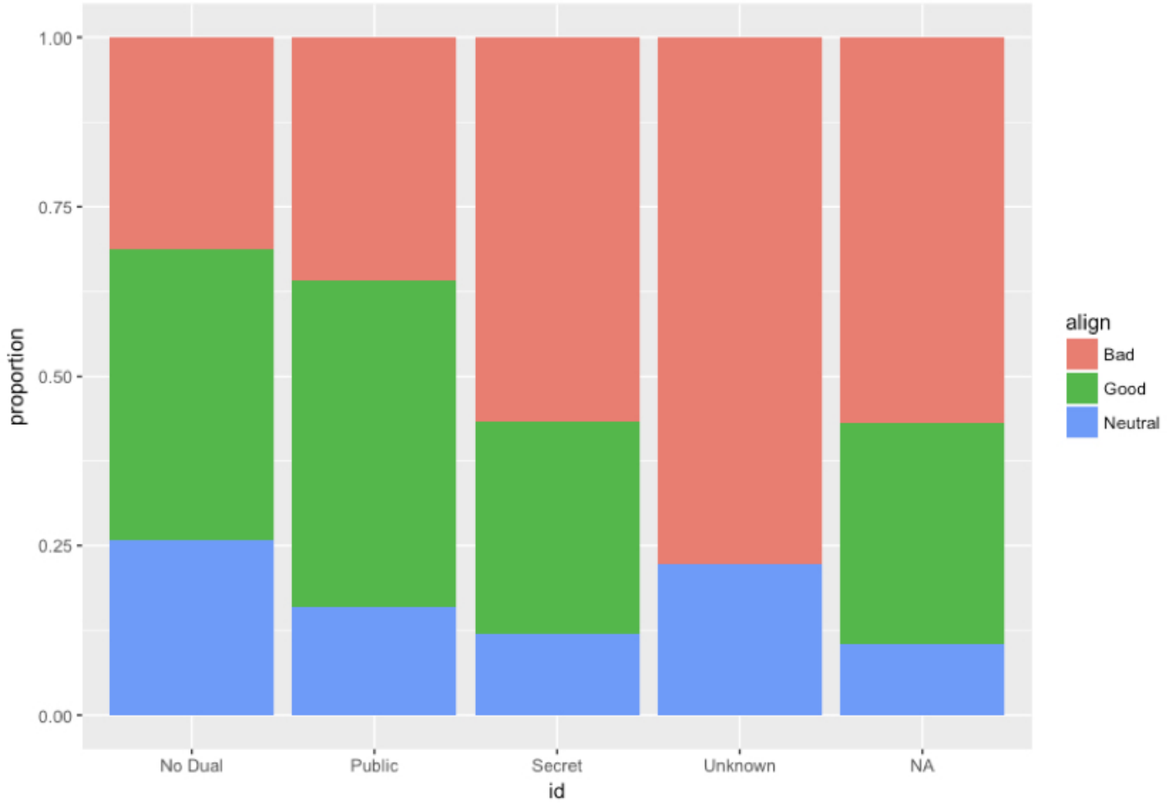
Conditional proportions

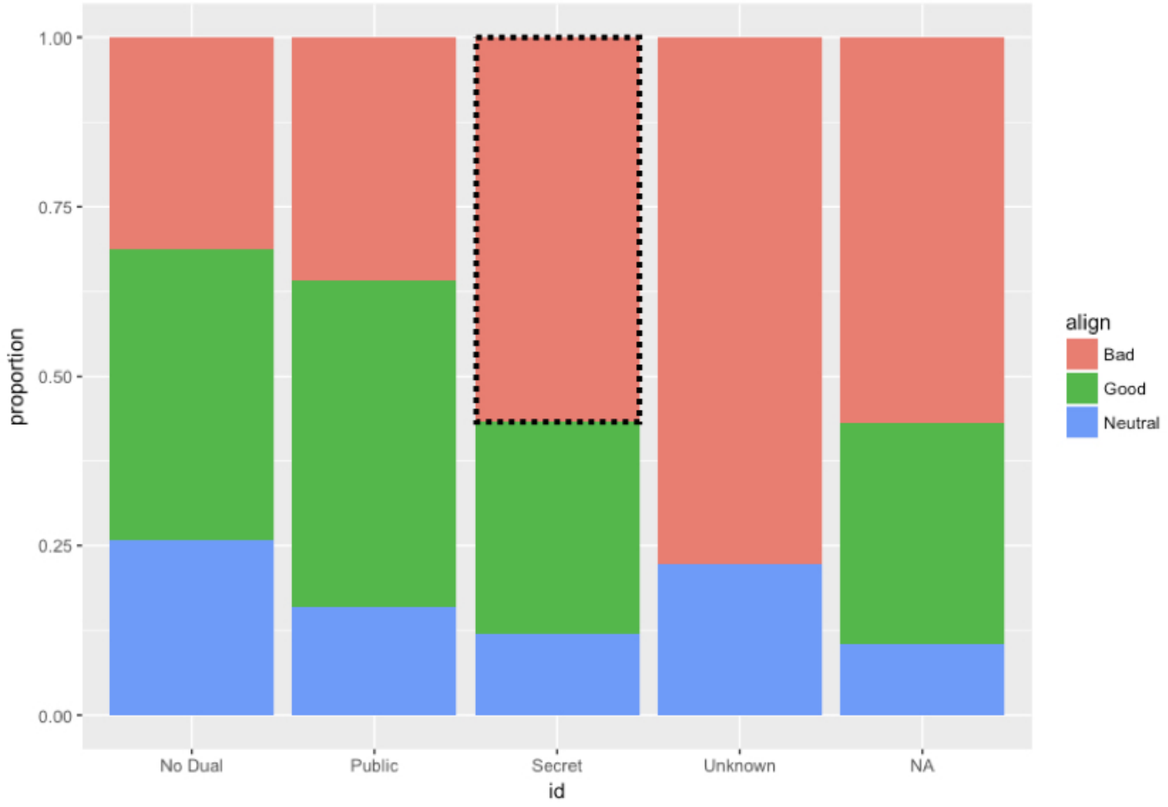
```
prop.table(tab_cnt, 1)
```

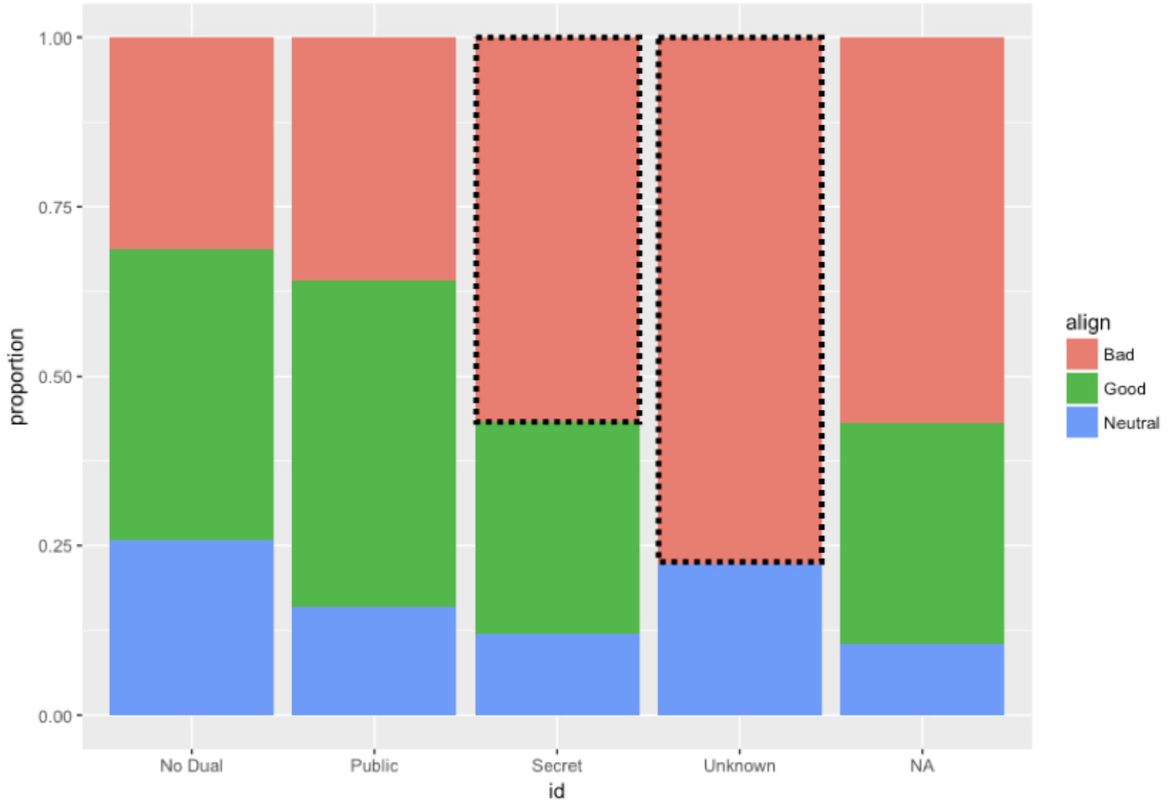
```
           Bad  Good Neutral
  No Dual 0.314 0.428   0.258
  Public  0.358 0.483   0.159
  Secret  0.567 0.312   0.121
  Unknown 0.778 0.000   0.222
```

```
prop.table(tab_cnt, 2)
```

```
              Bad     Good  Neutral
  No Dual 0.066331 0.106907 0.168394
  Public  0.303946 0.484137 0.416667
  Secret  0.628743 0.408956 0.414076
  Unknown 0.000980 0.000000 0.000864
```

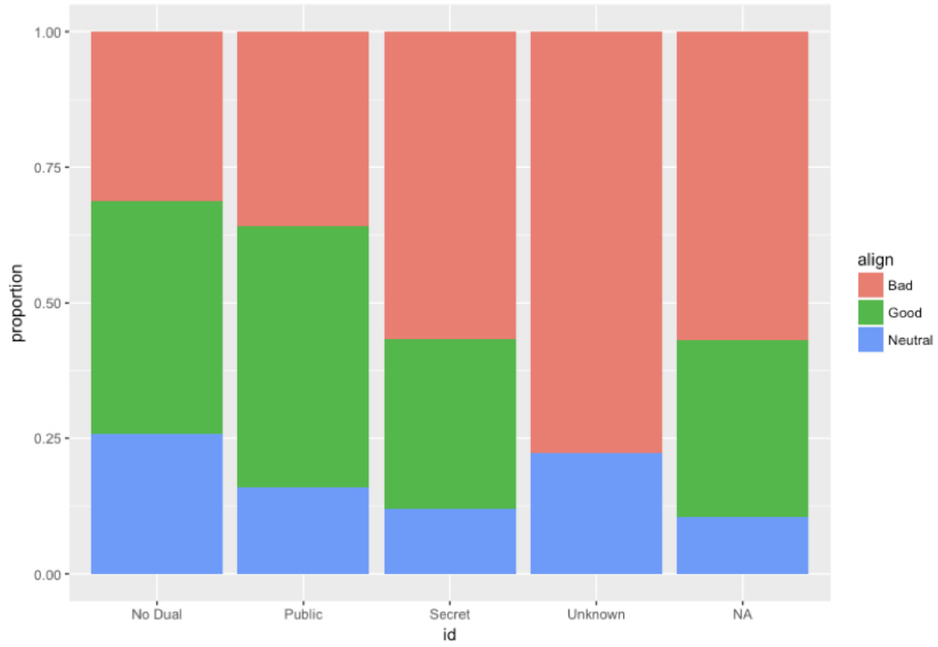

1.00
0.75
0.50
0.25
0.00
proportion
No Dual
Public
Secret
Unknown
NA
id
align
Bad
Good
Neutral


1.00
0.75
0.50
0.25
0.00
proportion
No Dual
Public
Secret
Unknown
NA
id
align
Bad
Good
Neutral


1.00
0.75
0.50
0.25
0.00
proportion
No Dual
Public
Secret
Unknown
NA
id
align
Bad
Good
Neutral

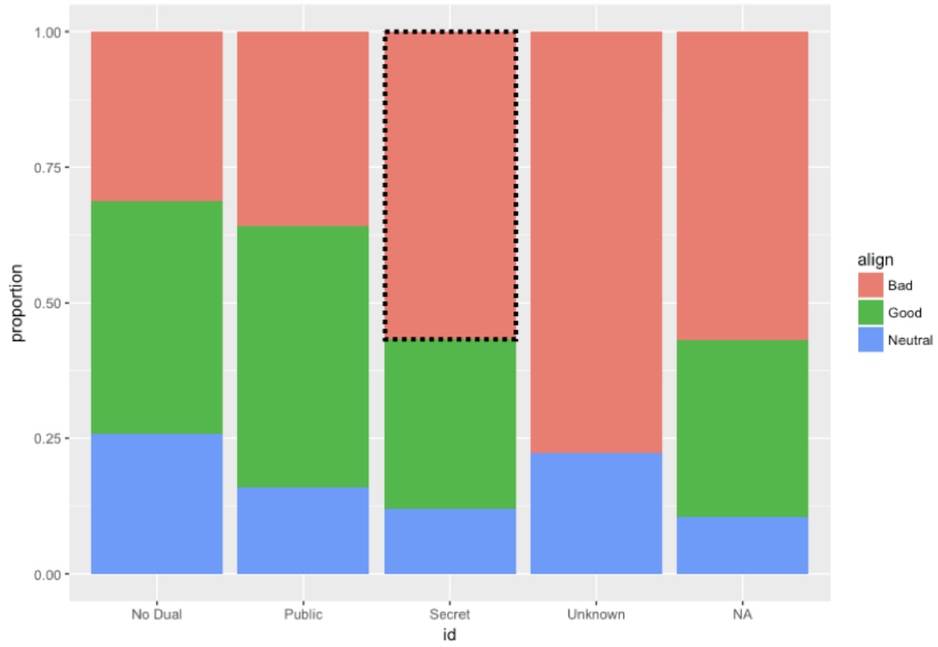
Conditional bar chart

```
ggplot(comics, aes(x = id, fill = align)) +
  geom_bar(position = "fill") +
  ylab("proportion")
```



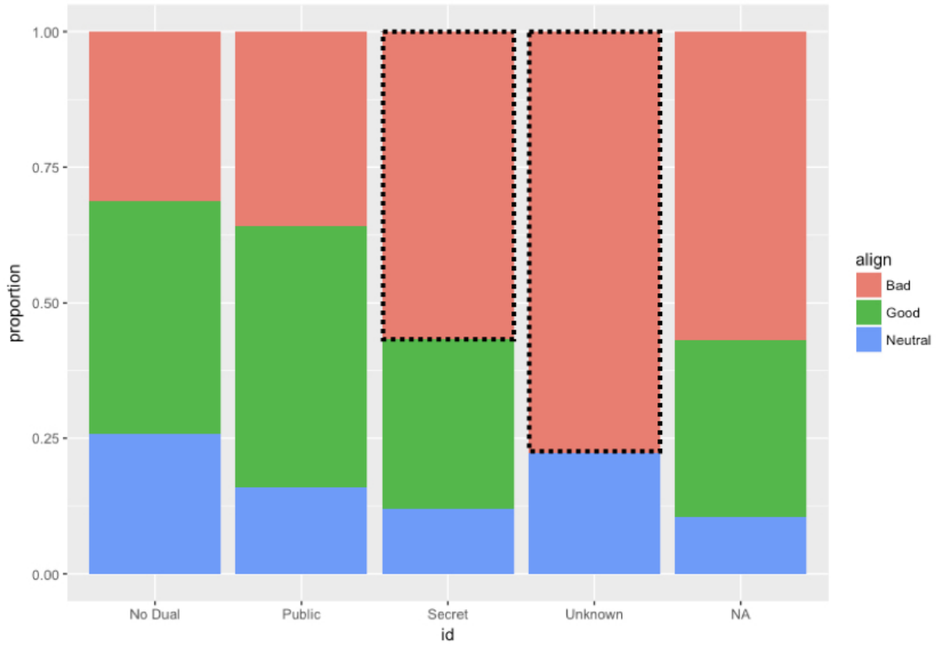
Conditional bar chart

```
ggplot(comics, aes(x = id, fill = align)) +
  geom_bar(position = "fill") +
  ylab("proportion")
```



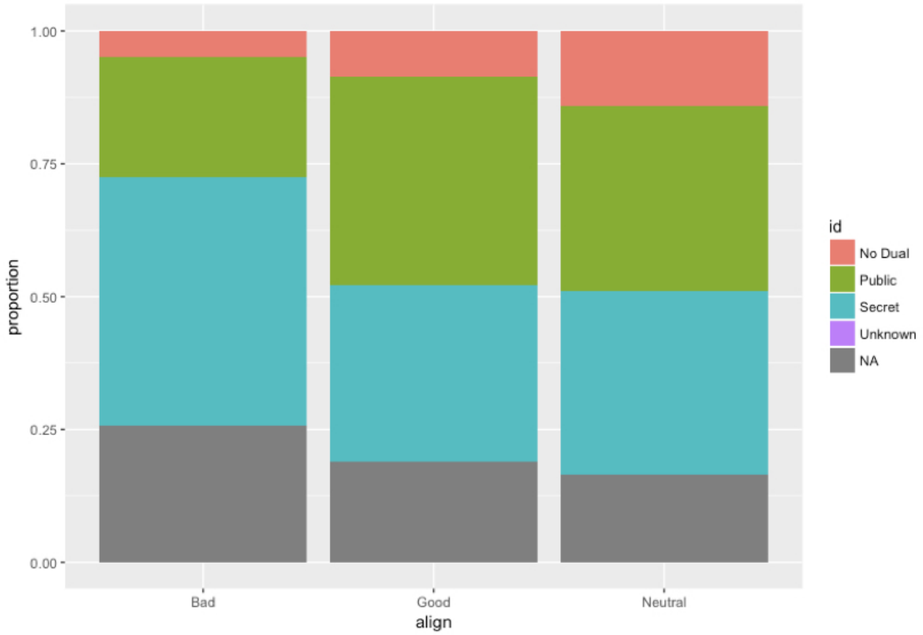
Conditional bar chart

```
ggplot(comics, aes(x = id, fill = align)) +
  geom_bar(position = "fill") +
  ylab("proportion")
```



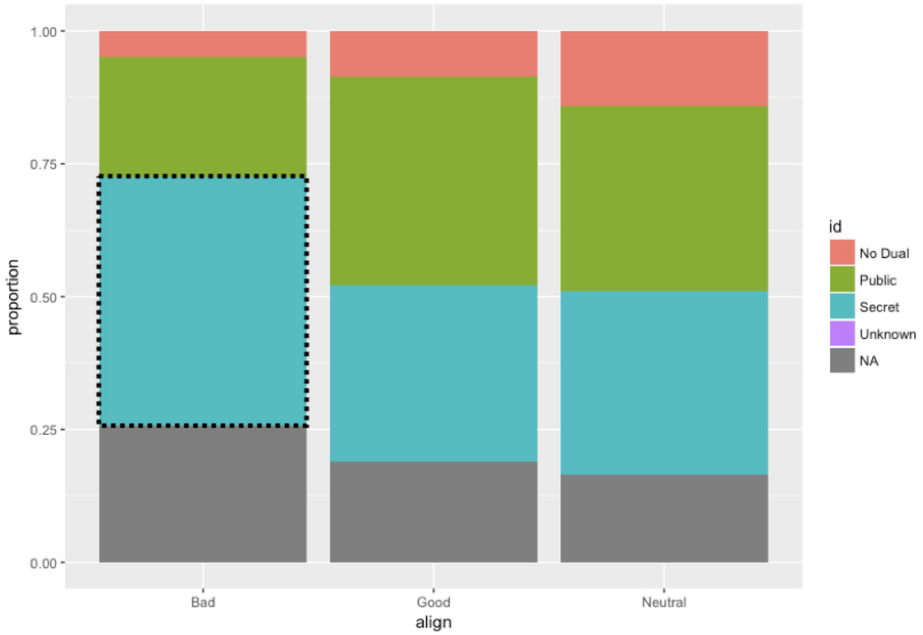
Conditional bar chart

```
ggplot(comics, aes(x = align, fill = id)) +
  geom_bar(position = "fill") +
  ylab("proportion")
```



Conditional bar chart

```
ggplot(comics, aes(x = align, fill = id)) +
  geom_bar(position = "fill") +
  ylab("proportion")
```



Let's practice!

EXPLORATORY DATA ANALYSIS IN R

Distribution of one variable

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Marginal distribution

```
table(comics$id)
```

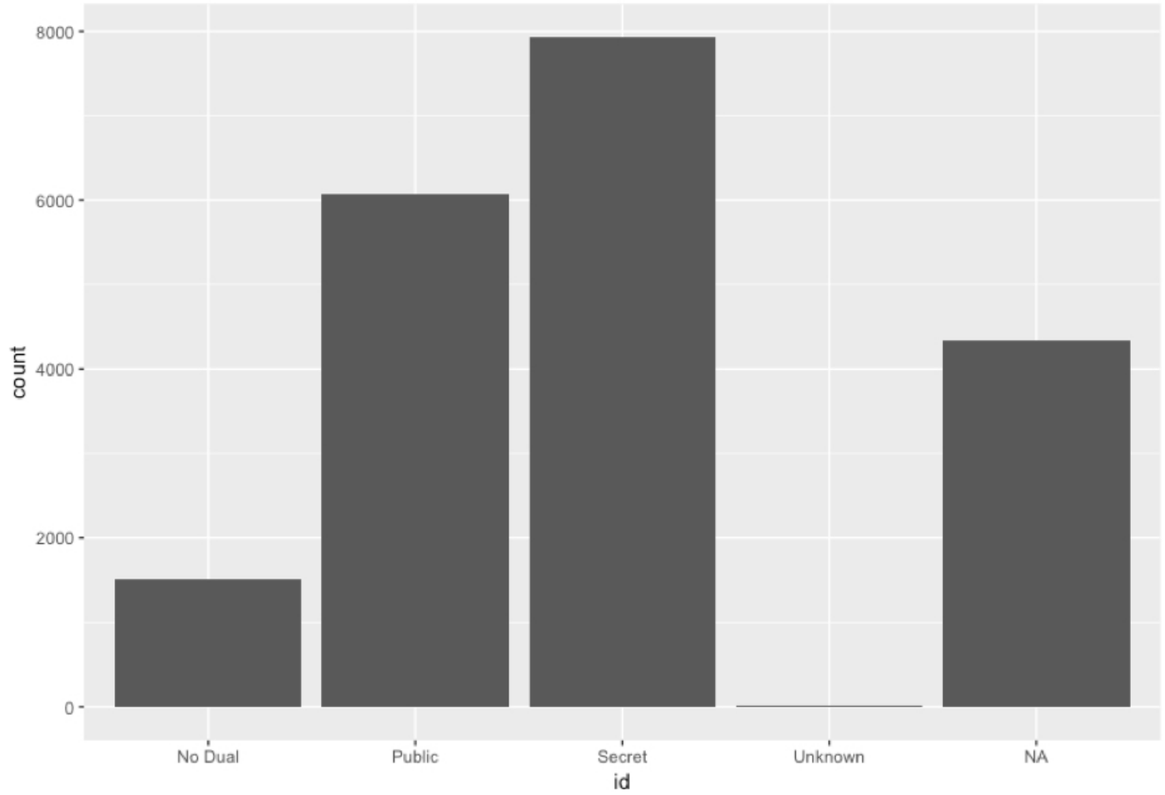
```
No Dual  Public  Secret Unknown
   1511    6067    7927       9
```

```
tab_cnt <- table(comics$id, comics$align)
tab_cnt
```

```
         Bad Good Neutral
No Dual  474  647     390
Public  2172 2930     965
Secret  4493 2475     959
Unknown    7    0       2
```

Simple barchart

```
ggplot(comics, aes(x = id)) +
  geom_bar()
```



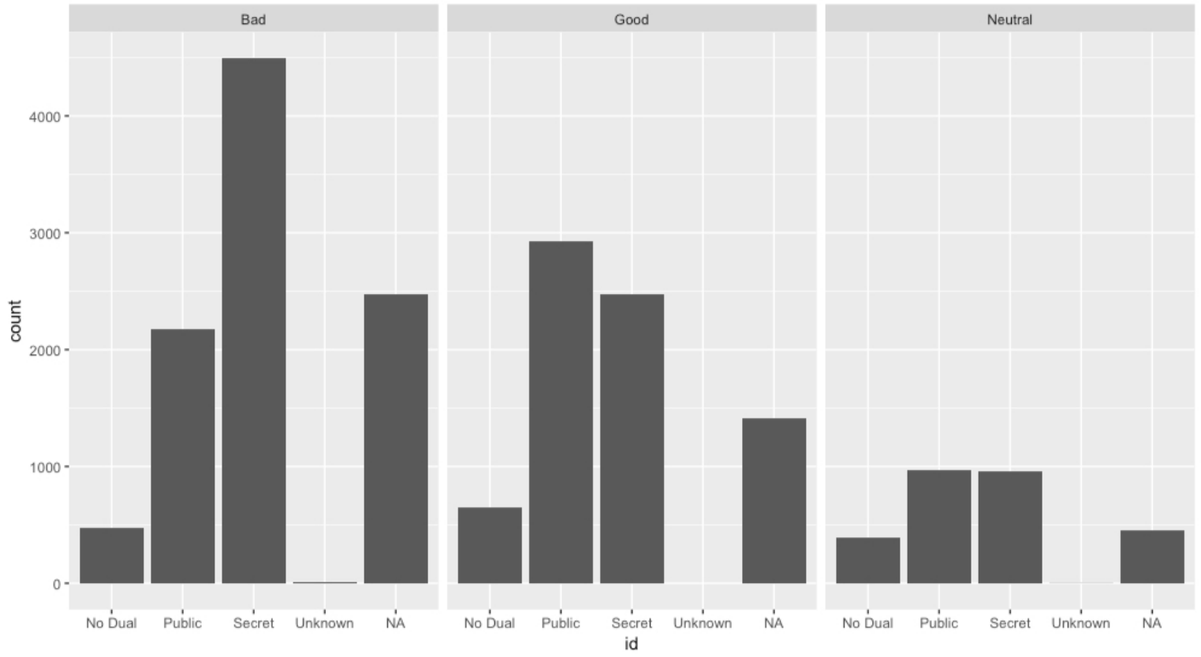
Faceting

```
tab_cnt <- table(comics$id, comics$align)
tab_cnt
```

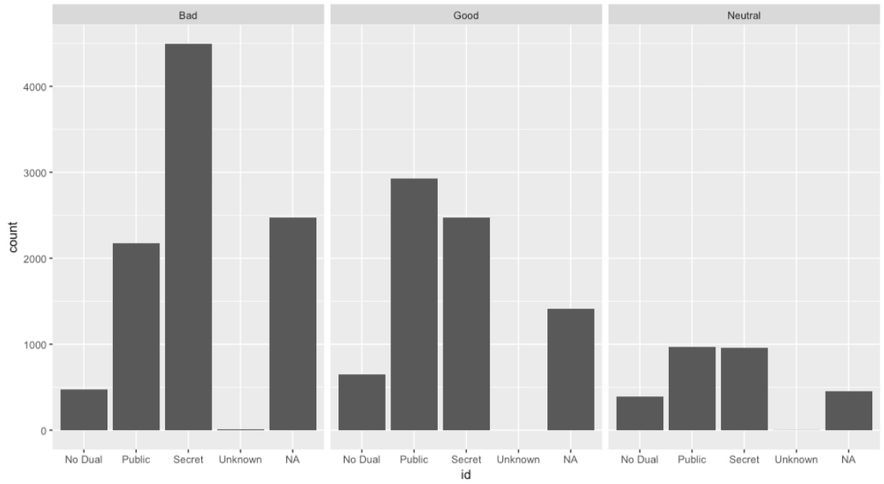
```
           Bad Good Neutral
No Dual    474  647     390
Public    2172 2930     965
Secret    4493 2475     959
Unknown      7    0       2
```

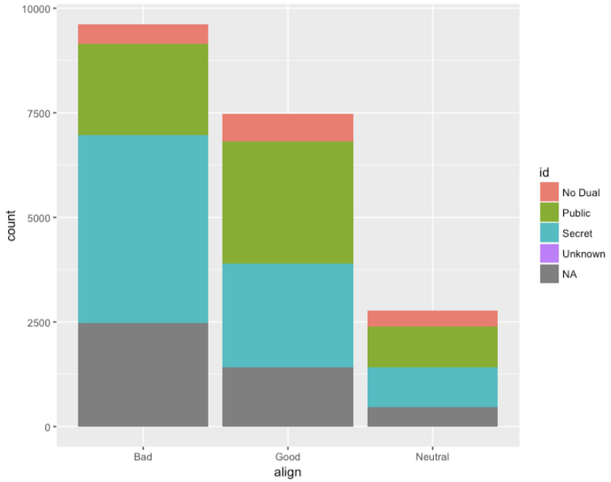
Faceted barcharts

```
ggplot(comics, aes(x = id)) +
  geom_bar() +
  facet_wrap(~align)
```

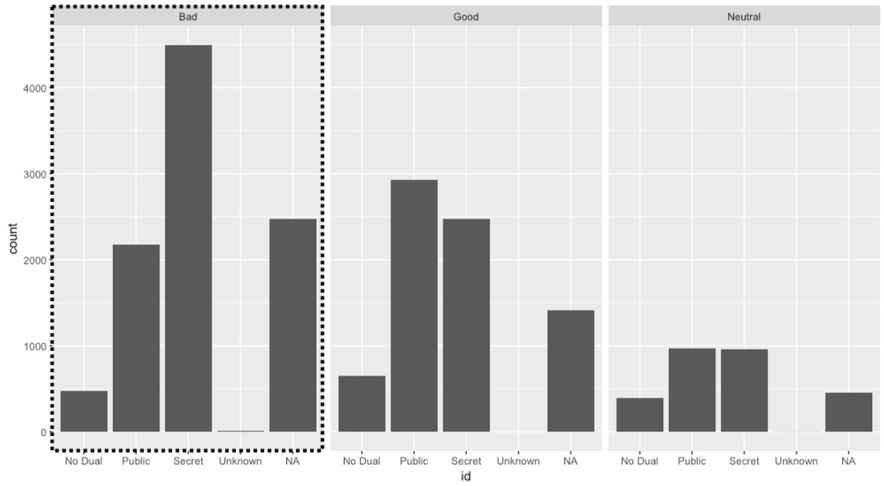


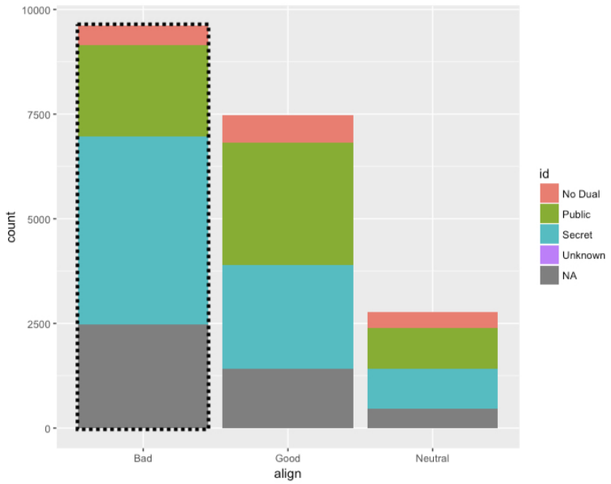
Faceting vs. stacking



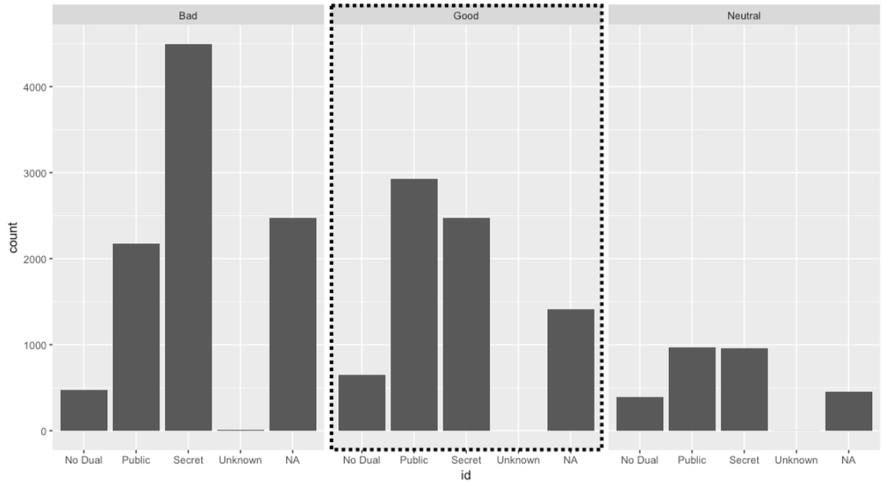


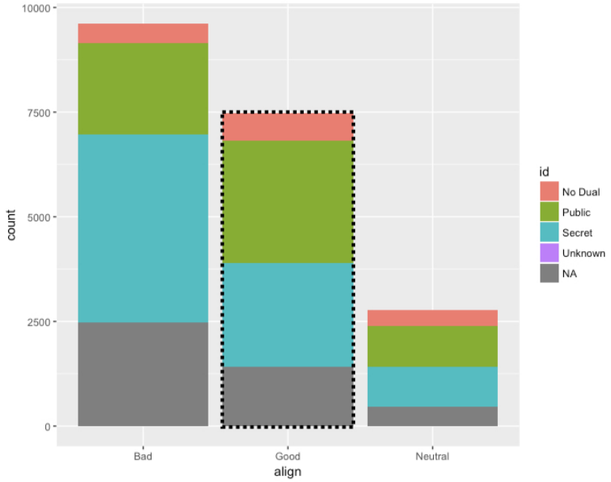
Faceting vs. stacking



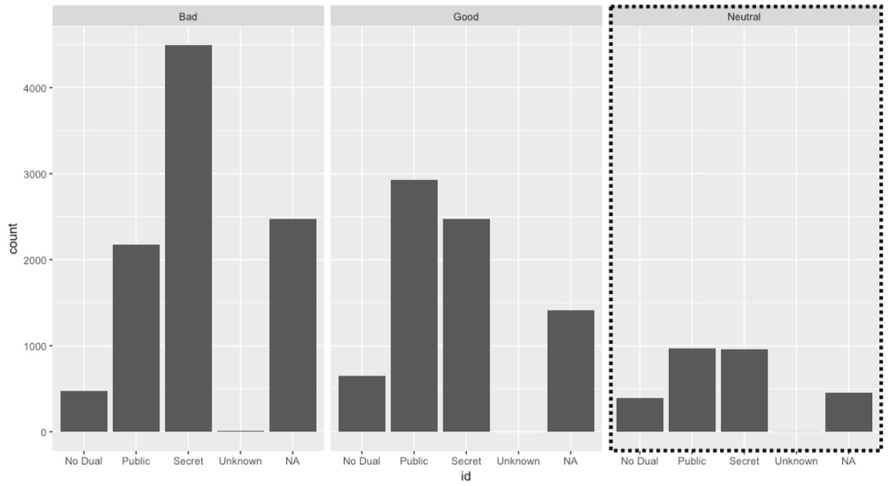


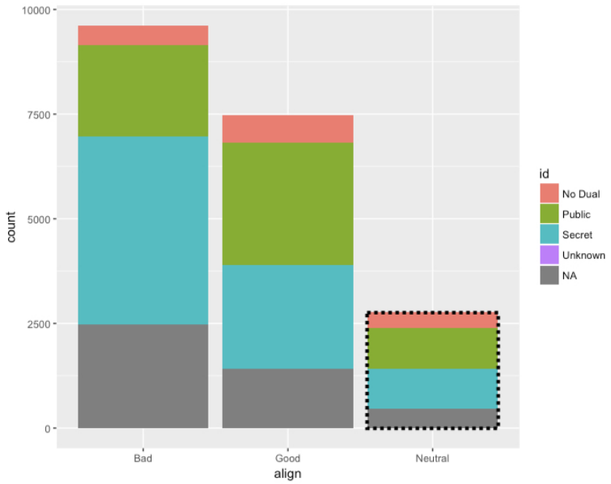
Faceting vs. stacking



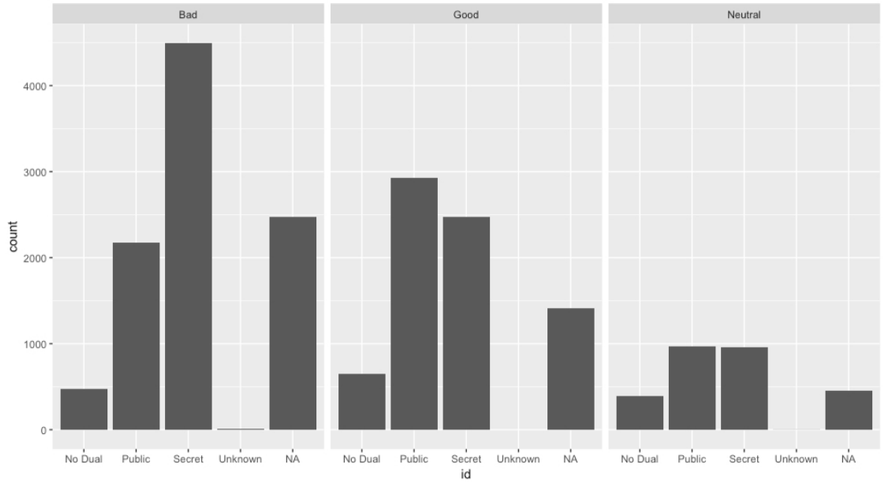


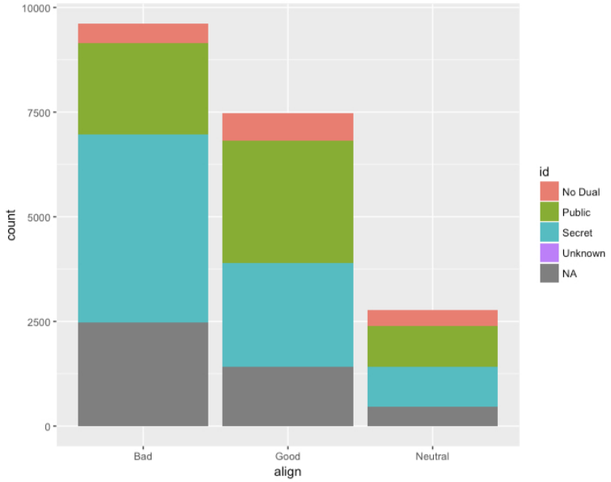
Faceting vs. stacking



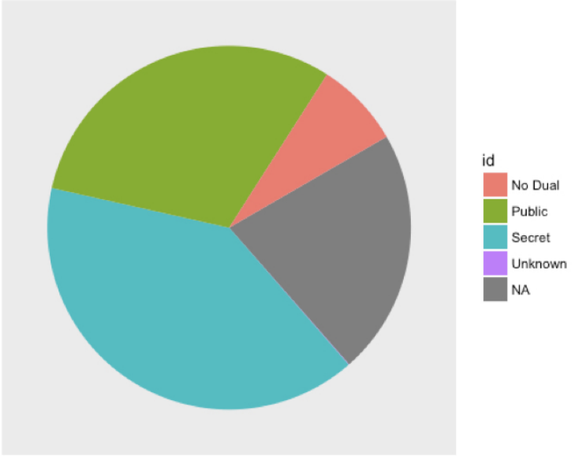


Faceting vs. stacking

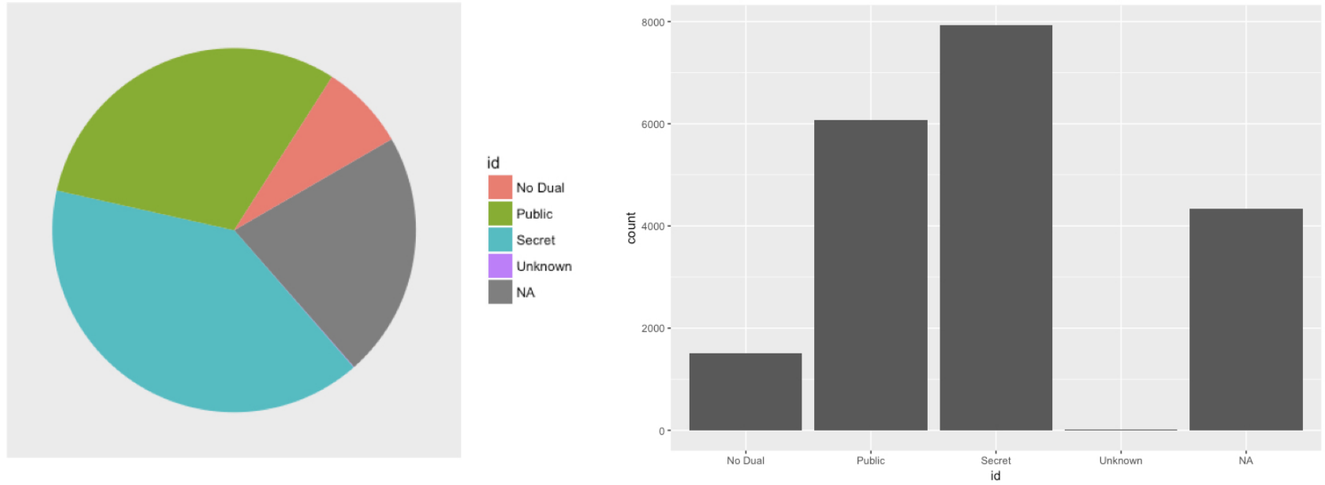




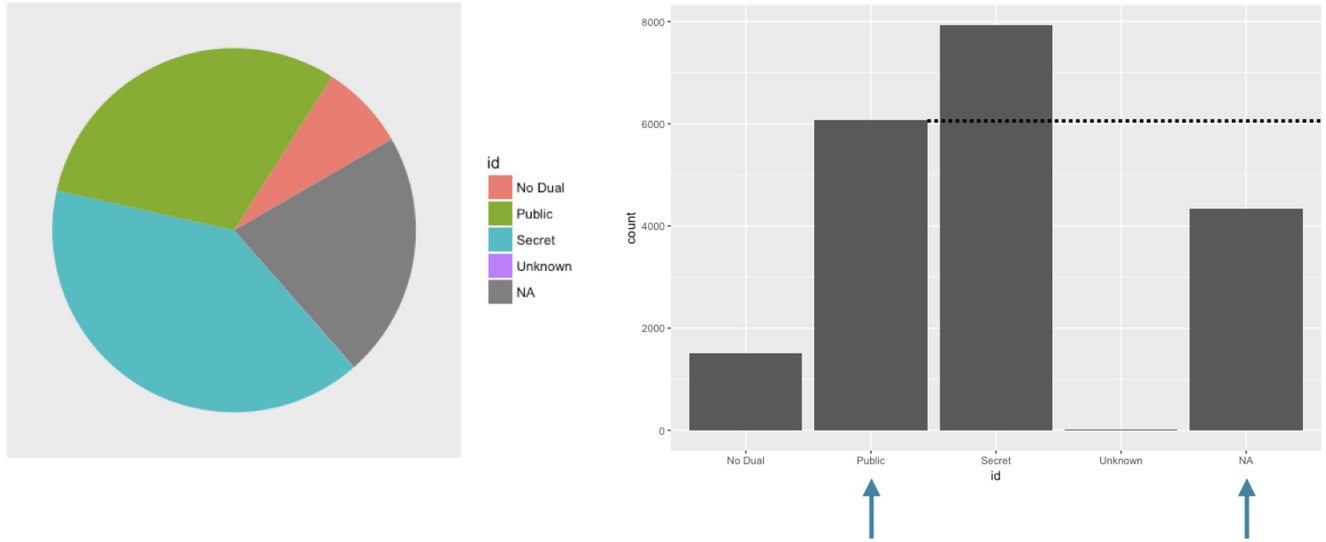
Pie chart vs. bar chart



Pie chart vs. bar chart



Pie chart vs. bar chart



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