THE ULTIMATE R EXAM CHEAT SHEET

1. LOAD DATA
library(tidyverse)
df <- read_csv("file.csv")

2. BASIC OPERATIONS
head(df)
df %>% select(col1, col2)
df %>% filter(Year == 2023)

3. SUMMARY STATISTICS
df %>% summarise(mean_gap = mean(Gap, na.rm=TRUE))
df %>% summarise(median_gap = median(Gap, na.rm=TRUE))
quantile(df$Gap, c(0.05,0.5,0.95), na.rm=TRUE)
df %>% count(Year)

4. GROUPING + SUMMARISING
df %>%
group_by(Sector) %>%
summarise(median_gap = median(Gap, na.rm=TRUE))

5. MUTATE (Create New Columns)
df %>% mutate(diff = Gap2023 - Gap2022)
df %>% mutate(index = 1 - Q4 / mean(c(Q1,Q2,Q3,Q4)))

6. RESHAPING DATA
pivot_wider: df %>% pivot_wider(names_from=Year, values_from=Gap)
pivot_longer: df %>% pivot_longer(cols=starts_with("Median"), names_to="category", values_to="gap")

7. PLOTTING
Histogram:
ggplot(df, aes(Gap)) + geom_histogram()

Bar Chart:
ggplot(df, aes(Sector, n)) + geom_col()

Scatterplot:
ggplot(df, aes(MeanGap, MedianGap)) + geom_point()

Boxplot:
ggplot(df, aes(Sector, Gap)) + geom_boxplot()

Percentile Lines:
geom_vline(xintercept = quantile(df$Gap, 0.05))

8. SORTING FOR PLOTS
df %>% arrange(n)
df %>% mutate(Sector = factor(Sector, levels = Sector))

9. COMMON EXAM SOLUTIONS
Compare years:

```
df %>% group_by(Year) %>% summarise(median_gap = median(Gap, na.rm=TRUE))
```

Find highest sector gap:

```
df %>% group_by(Sector) %>% summarise(median_gap=median(Gap,na.rm=TRUE)) %>%
arrange(desc(median_gap))
```

Mean vs Median plot:

```
ggplot(df, aes(MeanGap, MedianGap)) + geom_point() + geom_abline()
```

Histogram w/ percentiles:

```
ggplot(df, aes(Gap)) + geom_histogram() +
geom_vline(xintercept=quantile(df$Gap,0.05)) +
geom_vline(xintercept=quantile(df$Gap,0.95))
```

INTERPRETATION TEMPLATES

Histogram: "Most values fall between X and Y, with some outliers."
Scatterplot: "Points lie above/below the 45° line, meaning mean > median."
Group comparison: "Sector A has the largest gap; Sector B has the lowest."
Year difference: "Gap increased/decreased by X from 2022 to 2023."

MEMORY TRICK:

FILTER → GROUP → SUMMARISE → MUTATE → PIVOT → PLOT