analysis

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## Análisis lanzamiento de moneda

csv\_path <- "dataset.csv"  
data <- read.csv(csv\_path)

### Simulaciones y Datos Reales

library(ggplot2)  
  
# Realizar 15 simulaciones y compararlas con el resultado del dataset  
n\_sim <- 15  
coin <- c("heads", "tails")  
  
get\_samples <- function() {  
 sample(coin, size = length(data$lanzamiento), replace = TRUE)  
}  
  
sim\_results <- replicate(n\_sim,  
 {  
 sim\_data <- get\_samples()  
 heads\_count <- cumsum(sim\_data == "heads")  
 tails\_count <- cumsum(sim\_data == "tails")  
 n\_throws <- seq\_along(sim\_data)  
 data.frame(  
 throws = n\_throws,  
 heads = heads\_count / n\_throws,  
 tails = tails\_count / n\_throws  
 )  
 },  
 simplify = FALSE  
)  
  
# Crear un data frame para la evolución de frecuencias de los lanzamientos reales  
evolution\_df <- data.frame(  
 throws = seq\_along(data$lanzamiento),  
 heads = data$fr\_cara,  
 tails = data$fr\_sello  
)  
  
# Crear las capas de simulación  
sim\_layers\_heads <- lapply(seq\_len(n\_sim), function(i) {  
 geom\_line(  
 data = sim\_results[[i]],  
 aes(x = throws, y = heads),  
 color = "lightblue",  
 alpha = 0.5,  
 linewidth = 0.5  
 )  
})  
  
sim\_layers\_tails <- lapply(seq\_len(n\_sim), function(i) {  
 geom\_line(  
 data = sim\_results[[i]],  
 aes(x = throws, y = tails),  
 color = "lightcoral",  
 alpha = 0.5,  
 linewidth = 0.5  
 )  
})  
  
# Graficar las simulaciones junto con los datos reales  
ggplot() +  
 # Agregar las simulaciones primero para que queden en el fondo  
 sim\_layers\_heads +  
 sim\_layers\_tails +  
 # Línea de referencia teórica  
 geom\_hline(  
 yintercept = 0.5,  
 color = "black",  
 linetype = "dashed",  
 linewidth = 1,  
 ) +  
 # Datos reales encima  
 geom\_line(  
 data = evolution\_df,  
 aes(x = throws, y = heads, color = "Caras Reales"),  
 linewidth = 1.2  
 ) +  
 geom\_line(  
 data = evolution\_df,  
 aes(x = throws, y = tails, color = "Sellos Reales"),  
 linewidth = 1.2  
 ) +  
 # Configuración de colores y leyenda  
 scale\_color\_manual(  
 name = "",  
 values = c("Caras Reales" = "#1f77b4", "Sellos Reales" = "#d62728")  
 ) +  
 # Etiquetas y tema  
 labs(  
 title = "Evolución de Frecuencias Relativas: Simulaciones y Datos Reales",  
 x = "Número de Lanzamiento",  
 y = "Frecuencia Relativa",  
 ) +  
 # Estilo visual del gráfico  
 theme\_minimal(base\_size = 12) +  
 theme(  
 plot.title = element\_text(size = 14, face = "bold", hjust = 0.5, margin = margin(b = 10)),  
 plot.subtitle = element\_text(size = 10, hjust = 0.5, color = "gray40", margin = margin(b = 15)),  
 plot.caption = element\_text(size = 9, color = "gray50", hjust = 0),  
 legend.position = "bottom",  
 legend.title = element\_text(face = "bold"),  
 panel.grid.minor = element\_blank(),  
 panel.grid.major.x = element\_line(color = "gray90", linewidth = 0.3),  
 panel.grid.major.y = element\_line(color = "gray90", linewidth = 0.3)  
 ) +  
 # Límites del eje Y  
 ylim(-0, 1)

A graph showing different colored lines

AI-generated content may be incorrect.