

```

## 4. Exercício 5.11, p. 193 em Sprent and Smeeton (2001)

lvf <- c(564, 521, 495, 564, 560, 481, 545, 478, 580, 484, 539,
467)
rvf <- c(557, 505, 465, 562, 544, 448, 531, 458, 560, 485, 520,
445)

plot(lvf, rvf)
cor.test(lvf, rvf, method = "kendall")
cor.test(lvf, rvf, method = "spearman")

# Dados pareados
(z <- lvf - rvf)
qqnorm(z)
qqline(z)

(n <- length(z))

which(z == 0)

B <- sum(z > 0)
cat("\n B =", B, "\n")

# Dist. exata
(binom.test(B, n, alternative = "two.side"))
(wilcox.test(z, mu = 0, alternative = "two.sided", conf.int =
TRUE))
(wilcox.test(lvf, rvf, mu = 0, paired = TRUE, alternative =
"two.sided"))

# Amostras independentes
wilcox.test(lvf, rvf)
ks.test(lvf, rvf)

## 5. Exercício 5.14, p. 193 em Sprent and Smeeton (2001)
semdif <- c(204, 218, 197, 183, 227, 233, 191)
comdif <-c(243, 228, 261, 202, 343, 242, 220, 239)

Fm5 <- ecdf(semdif)
Fn5 <- ecdf(comdif)
plot(Fm5, main = "", pch = 20, xlim = range(semdif, comdif),
      xlab = "Tempo total (s)", ylab = "Probabilidade")
lines(Fn5, col = "blue", pch = 20)
legend("bottomright", c("Sem dificuldade", "Com dificuldade"),

```

```

lty = 1,
      col = c("black", "blue"), bty = "n")

# Cálculo das diferenças
tempo <- sort(unique(c(semdif, comdif)))
Fmtempo <- Fm5(tempo)
Fntempo <- Fn5(tempo)
absdif <- abs(Fmtempo - Fntempo)
calculo <- cbind(tempo, Fmtempo, Fntempo, absdif)
colnames(calculo) <- c("Tempo (s)", "Fm", "Fn", "|Fm - Fn|")
print(calculo, digits = 3)

ks.test(semdif, comdif)
ks.test(semdif, comdif, alternative = "greater")

(result5 <- wilcox.test(semdif, comdif, conf.int = TRUE))
cat("\n Estimativa do deslocamento ( $\theta^{\wedge}$ ) =",
    result5$estimate)

# Gráfico de quantis (QQ) com deslocamento
faixa <- range(semdif - result5$estimate, comdif)
qqplot(semdif - result5$estimate, comdif, pch = 20, xlim =
faixa,
        ylim = faixa, xlab = "Tempo total (s) - sem dificuldade
deslocado",
        ylab = "Tempo total (s) - cem dificuldade", col = "blue")
abline(0, 1, lty = 2)

wilcox.test(semdif, comdif, alternative = "less")

## 8. Exercício 5.22, p. 195 em Sprent and Smeeton (2001)
library(coin)

males <- scan()
8 6 4 2 10 5 6 6 19 4 10 4 10 12 7 2 5
1 8 2 0 7 6 4 4 11 2 16 8 7 8 4 0 2

females <- scan()
4 7 13 4 8 8 4 14 5 6 4 12 9 9 9 8 12
4 8 8 4 11 6 15 9 8 14 9 8 9 7 12 11 7
4 10 7 8 8 7 9 10 16 14 15 10 4 6 3 9 3
10 3 8

cat("\n m =", m <- length(males), ", n =", n <- length(females),
    "\n")

```

```

table(c(males, females))
rank(c(males, females))

Fm8 <- ecdf(males)
Fn8 <- ecdf(females)
plot(Fm8, main = "", pch = 20, xlim = range(males, females),
      xlab = "Escore DMF", ylab = "Probabilidade")
lines(Fn8, col = "blue", pch = 20)
legend("bottomright", c("Masculino", "Feminino"), lty = 1,
      col = c("black", "blue"), bty = "n")

ks.test(males, females)

(result8 <- wilcox.test(males, females, conf.int = TRUE))
cat("\n Estimativa do deslocamento ( $\theta^{\wedge}$ ) =",
result8$estimate)

# Gráfico de quantis (QQ) com deslocamento
faixa <- range(males - result8$estimate, females)
qqplot(males - result8$estimate, females, pch = 20, xlim =
faixa,
      ylim = faixa, xlab = "Escore DMF - masculino deslocado",
      ylab = "Escore DMF - feminino", col = "blue")
abline(0, 1, lty = 2)

# Teste exato condicional
gender <- factor(rep(c("masc", "fem"), times = c(m, n)))
wilcox_test(c(males, females) ~ gender, distribution = "exact")

# Efeito dos empates
dadosaux <- jitter(c(males, females))
wilcox.test(dadosaux[1:m], dadosaux[(m + 1):(m + n)], exact =
TRUE)

```