Help

Description:

Equação que identifica o ponto de inflexão de uma regressão e fragmenta os dados em dois conjuntos. Gerando assim gráficos e coeficientes de inclinação para os diferentes conjuntos de dados. Além de identificar se há diferença entre as inclinações das regressões.

Usage:

```
compara_coefs (data, plota=F)
```

Arguments:

- data: um data frame contendo as variáveis que se deseja analisar.
- plota: identificador de qual gráfico se deseja como resultado (FALSE, RTS ou PSI).

Details:

Equação utilizada para segmentar uma regressão com possível variação entre os dados, como uma regressão exponencial.

Tem como resultado o ponto de inflexão que se divide a reta, além de informar os coeficientes de inclinação de cada uma das retas resultantes, e a diferença entre as inclinações.

Quando utilizado RTS dois gráficos das regressões são gerados para os diferentes conjuntos de dados separados pelo ponto de inflexão. Serão plotados também suas respectivas linhas de tendência. Exemplo:

Quando utilizado PSI, um gráfico é gerado com o conjunto de dados total, e uma linha de tendência fragmentada considerando o ponto de inflexão. Exemplo:

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References:

Sokal, R.R., & Rohlf, F.J. Multiple and curvilinear regression. Pp. 609-684. In: Sokal, R.R., & Rohlf, F.J. (Eds.). Biometry. 1995. New York, NY. 850 p.

Paternoster, R., Brame, R., Mazerolle, P., & Piquero, A. R. 1998. Using the Correct Statistical Test for the Equality of Regression Coefficients. Criminology, 36(4), 859–866

Andrade JM, Estévez-Pérez MG. 2014. Statistical comparison of the slopes of two regression lines: a tutorial. Analytica Chimica Acta, 838:1–12.

See Also:

https://cran.r-project.org/web/packages/segmented/index.html

https://stats.stackexchange.com/questions/55501/test-a-significant-difference-between-two-slope-values

https://www.researchgate.net/profile/Paul_Mazerolle/publication/227622791_Using_the_Correct_Statistical_Test_for_Equality_of_Regression_Coefficients/links/0c9605322187ba6c70000000/Using-the-Correct-Statistical-Test-for-Equality-of-Regression-Coefficients.pdf

http://ac.els-cdn.com/S000326701400511X/1-s2.0-S000326701400511X-main.pdf?_tid=cf8835e0-583c-11e7-9f9d-00000aab0f02&acdnat=1498240566_b7f95d755f8c3baae605de4ad982869e

Examples:

```
  x <-
c(1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,2,1,2,
2,1,2,1,2,2,2,2,2,1,2,2,1,3,1,3,1,2,1,2,2,3,3,2,3,3,3,2,3,3,2,1,5,5,1,4,3,4,
3,3,5,7,2,4,6,4,4,3,6,5,5,3,4,3,4,7,5,7,11,3,6,6,6,9,1,1,3,9,3,4,6,6,12,6,2,
12,8,2,4,12,6,8,9,6,5,4,4,11,4,18,8,10,8,17,5,16,16,6,5,18,3,1,10,2,11,21,8,
11,15,9,13,14,3,11,17,18,9,16,17,12,18,2,9,17,14,14,5,21,21,13,17,15,9,1,18,
17,7,2,17,23,22,27,10,10,17,25,12,28,12,13,14,5,20,13,3,17,16,21,11,27,19,19
,19,22,19,6,30,16,13,10,30,18,17,30,4,23,20,18,5,22,10,37,38,19,36,36,34,37,
36,25,30,26,22,32,30,30,45,18,25,42,44,24,38,34,14,16,6,36,26,29,28,44,20,31
,45,39,43,46,47,34,46,47,40,48,43,49,46,48,49,49)
  y <-
c(18.36734694,18.36734694,18.36734694,18.36734694,18.36734694,18.36734694,18
.36734694,18.36734694,18.36734694,18.36734694,18.36734694,20.40816327,20.40816327,20.408
16327,20.40816327,20.40816327,20.40816327,22.44897959,22.44897959,22.4489795
9,22.44897959,24.48979592,24.48979592,26.53061224,26.53061224,26.53061224,28
.57142857,28.57142857,30.6122449,30.6122449,32.65306122,32.65306122,34.69387
755,34.69387755,36.73469388,38.7755102,38.7755102,38.7755102,40.81632653,40.
81632653,40.81632653,40.81632653,40.81632653,42.85714286,44.89795918,48.9795
9184,51.02040816,51.02040816,53.06122449,55.10204082,57.14285714,61.2244898,
61.2244898,63.26530612,63.26530612,63.26530612,67.34693878,67.34693878,69.38
77551,77.55102041,77.55102041,77.55102041,79.59183673,81.63265306,81.6326530
6,89.79591837,89.79591837,95.91836735,104.0816327,112.244898,124.4897959,130
.6122449,134.6938776,138.7755102,146.9387755,146.9387755,151.0204082,161.224
4898,163.2653061,165.3061224,167.3469388,169.3877551,169.3877551,169.3877551
,171.4285714,181.6326531,185.7142857,208.1632653,220.4081633,224.4897959,230
.6122449,240.8163265,240.8163265,246.9387755,267.3469388,269.3877551,271.428
```

```
5714,304.0816327,306.122449,310.2040816,318.3673469,332.6530612,342.8571429,
355.1020408,355.1020408,387.755102,395.9183673,395.9183673,397.9591837,404.0
816327,430.6122449,448.9795918,451.0204082,455.1020408,465.3061224,465.30612
24,467.3469388,469.3877551,518.3673469,522.4489796,528.5714286,532.6530612,5
34.6938776,534.6938776,553.0612245,563.2653061,569.3877551,577.5510204,583.6
734694,583.6734694,600,612.244898,618.3673469,628.5714286,689.7959184,714.28
57143,730.6122449,738.7755102,748.9795918,802.0408163,855.1020408,875.510204
1,895.9183673,906.122449,924.4897959,934.6938776,948.9795918,955.1020408,977
.5510204,989.7959184,997.9591837,1014.285714,1026.530612,1040.816327,1071.42
8571,1083.673469,1102.040816,1110.204082,1126.530612,1130.612245,1142.857143
,1185.714286,1218.367347,1224.489796,1236.734694,1242.857143,1248.979592,125
9.183673,1314.285714,1424.489796,1430.612245,1467.346939,1495.918367,1502.04
0816,1528.571429,1534.693878,1540.816327,1557.142857,1608.163265,1632.653061
,1657.142857,1691.836735,1691.836735,1738.77551,1765.306122,1916.326531,1928
.571429,2055.102041,2057.142857,2059.183673,2071.428571,2104.081633,2155.102
041,2171.428571,2193.877551,2226.530612,2251.020408,2357.142857,2508.163265,
2553.061224,2579.591837,2581.632653,2738.77551,2740.816327,2759.183673,2897.
959184,2902.040816,2904.081633,2914.285714,3057.142857,3193.877551,3204.0816
33,3306.122449,3373.469388,3381.632653,3428.571429,3491.836735,3604.081633,3
875.510204,4028.571429,4273.469388,4781.632653,5002.040816,5004.081633,5575.
510204,5683.673469,6073.469388,6185.714286,6212.244898,6391.836735,6434.6938
78,6442.857143,6591.836735,6591.836735,6724.489796,6775.510204,8030.612245,8
710.204082,9410.204082,9434.693878,9991.836735,10787.7551,11000,11048.97959,
11524.4898,12085.71429,12881.63265,13620.40816,14087.7551,14089.79592,15636.
73469,16361.22449,16440.81633,16759.18367,16846.93878,18267.34694,20240.8163
3,22004.08163,22816.32653,26493.87755,29981.63265,32777.55102,33724.4898,372
40.81633,39116.32653,54540.81633,56977.55102,73912.2449)
  data <- data.frame(x,y)
  compara_coefs(data,plota = "RTS")
  compara_coefs(data,plota = "PSI")
  compara_coefs(data,plota = F)
```