R Package tsoutliers

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Abstract

This is a minimal introduction to package tsoutliers. Further information is available in the references given below.

1   Introduction

Details about the methodology and algorithms implemented in the package are given in this document. As a preliminary introduction and discussion see these posts: https://www.jalobe.com/blog/tsoutliers/ and https://stats.stackexchange.com/questions/104882/.

Examples   Fit a local level model to the Nile time series and check for the presence of possible outliers (additive outliers, level shifts or transitory changes):

```
> library("tsoutliers")
> resNile1 <- tso(y = Nile, types = c("AO", "LS", "TC"),
+   tsmethod = "stsm", args.tsmodel = list(model = "local-level"))
> resNile1$fit$call$xreg <- NULL
> resNile1

Call:
structure(list(method = "L-BFGS-B"), .Names = "method")


Parameter estimates:
             LS29   var1  var2
Estimate   -247.78  16136     0
Std. error   11.71   1163   NaN


Log-likelihood: -633.0286
Convergence: 0
Number of iterations: 46 46
Variance-covariance matrix: optimHessian


Outliers:
```

```
     type ind time coefhat   tstat
1    LS  29 1899   -247.8 -21.16
```

Choose and fit an ARIMA model for the Nile time series checking for the presence
detect possible outliers (additive outliers, level shifts or transitory changes):

```
> resNile2 <- tso(y = Nile, types = c("AO", "LS", "TC"),
+   discard.method = "bottom-up", tsmethod = "auto.arima",
+   args.tsmethod = list(allowdrift = FALSE, ic = "bic"))
> resNile2

Series: Nile
Regression with ARIMA(0,0,0) errors

Coefficients:
      intercept        LS29        AO43
      1097.7500   -242.2289   -399.5211
s.e.    22.6783     26.7793    120.8446

sigma^2 estimated as 14846:  log likelihood=-620.65
AIC=1249.29   AICc=1249.71   BIC=1259.71

Outliers:
  type ind time coefhat  tstat
1   LS  29 1899   -242.2 -9.045
2   AO  43 1913   -399.5 -3.306
```