AMOC (At Most One Change) detects a single, most significant change point in a univariate time series. In this tutorial we will:

* Load a synthetic dataset with ground-truth change points
* Visualize the series
* Configure and run the AMOC detector (hcp\_amoc)
* Inspect detections and evaluate against ground truth
* Plot the detections over the series

# Install Harbinger (if needed)  
#install.packages("harbinger")

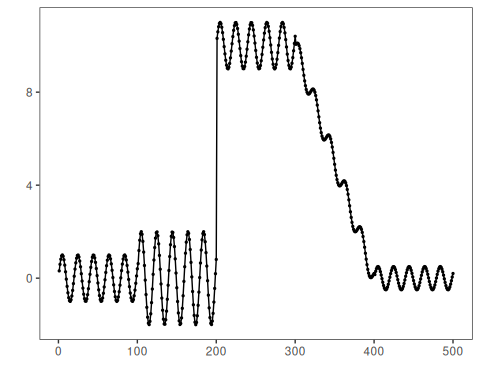
# Load required packages  
library(daltoolbox)  
library(harbinger)

# Load example change-point datasets  
data(examples\_changepoints)

# Select a dataset ("complex" contains multiple regimes)  
dataset <- examples\_changepoints$complex  
head(dataset)

## serie event  
## 1 0.3129618 FALSE  
## 2 0.5944808 FALSE  
## 3 0.8162731 FALSE  
## 4 0.9560557 FALSE  
## 5 0.9997847 FALSE  
## 6 0.9430667 FALSE

# Plot the time series to visualize regime changes  
har\_plot(harbinger(), dataset$serie)



# Configure the AMOC change-point detector (single change)  
model <- hcp\_amoc()

# Fit the detector (no training required, keeps parameters on object)  
model <- fit(model, dataset$serie)

# Run detection over the full series  
detection <- detect(model, dataset$serie)

# Show detected change-point indices  
print(detection |> dplyr::filter(event == TRUE))

## idx event type  
## 1 389 TRUE changepoint

# Evaluate detections against the labeled events  
evaluation <- evaluate(model, detection$event, dataset$event)  
print(evaluation$confMatrix)

## event   
## detection TRUE FALSE  
## TRUE 0 1   
## FALSE 4 495

# Plot detections and ground truth on top of the series  
har\_plot(model, dataset$serie, detection, dataset$event)

