

README (DATASET.txt)

■ 15 types of time series in DATASET.txt. Each series contains 1000 data. (T=1000)

V1 column: AR(1) series with coefficient $a = 0.2$

V2 column: AR(1) series with coefficient $a = 0.5$

V3 column: AR(1) series with coefficient $a = 0.8$

V4 column: MA(1) series with coefficient $a = 0.2$

V5 column: MA(1) series with coefficient $a = 0.5$

V6 column: MA(1) series with coefficient $a = 0.8$

V7 column: ARMA(1,1) series with coefficient $a = 0.2, b = 0.2$

V8 column: ARMA(1,1) series with coefficient $a = 0.5, b = 0.2$

V9 column: ARMA(1,1) series with coefficient $a = 0.8, b = 0.2$

V10 column: ARCH(1) series with coefficient $a_1 = 0.2$

V11 column: ARCH(1) series with coefficient $a_1 = 0.5$

V12 column: ARCH(1) series with coefficient $a_1 = 0.8$

V13 column: GARCH(1,1) series with coefficient $a_1 = 0.2, b_1 = 0.75$

V14 column: GARCH(1,1) series with coefficient $a_1 = 0.5, b_1 = 0.45$

V15 column: GARCH(1,1) series with coefficient $a_1 = 0.8, b_1 = 0.15$

■ DGP

1. AR(1) : $y_t = ay_{t-1} + \varepsilon_t, \quad \varepsilon_t \sim N(0, 1), \quad a = (0.2, 0.5, 0.8)$

2. MA(1) : $y_t = \varepsilon_t - a\varepsilon_{t-1}, \quad \varepsilon_t \sim N(0, 1), \quad a = (0.2, 0.5, 0.8)$

3. ARMA(1, 1) :

$$y_t - ay_{t-1} = \varepsilon_t - b\varepsilon_{t-1}, \quad \varepsilon_t \sim N(0, 1), \quad a = (0.2, 0.5, 0.8), \quad b = 0.2$$

4. ARCH(1) :

$$h_t = a_0 + a_1 y_{t-1}^2, \quad y_t = \sqrt{h_t} \varepsilon_t, \quad \varepsilon_t \sim N(0, 1), \quad a_0 = 0.5, \quad a_1 = (0.2, 0.5, 0.8)$$

5. GARCH(1,1)

$$h_t = a_0 + a_1 y_{t-1}^2 + b_1 h_{t-1}, \quad y_t = \sqrt{h_t} \varepsilon_t, \quad \varepsilon_t \sim N(0, 1), \\ a_0 = 0.5, \quad (a_1, b_1) = (0.2, 0.75), \text{ or } (0.5, 0.45), \text{ or } (0.8, 0.15)$$

■ How to read data from dataset.txt

#Read data from dataset.txt

```
rr <- read.table("C:/path...../DATASET.txt")
```

#see what's inside dataset.txt

```
attributes(rr)
```

grey color words are output result

```
$names
```

```
[1] "V1" "V2" "V3" "V4" "V5" "V6" "V7" "V8" "V9" "V10" "V11" "V12" "V13" "V14" "V15"
```

```
$class
```

```
[1] "data.frame"
```

```
$row.names
```

```
#plot 1st sequence
```

```
plot(rr$V1, type='l' )
```