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## mc\_alfonsi\_bates\_out

### Input parameters

- Number of iterations  $N$
- Number of discretization steps  $M$
- Generator type
- Increment  $inc$
- Confidence Value

### Output parameters

- Price  $P$
- Error price  $\sigma_P$
- Delta  $\delta$
- Error delta  $\sigma_{delta}$
- Price Confidence Interval:  $ICp$  [Inf Price, Sup Price]
- Delta Confidence Interval:  $ICp$  [Inf Delta, Sup Delta]

### Description

Computation of a european option in the Heston stochastic volatility model.  
 This model is given by,

$$\begin{aligned}
 dS_t &= (r - q)S_t dt + \sqrt{v_t}S_t dW_t^1, \\
 dv_t &= k(\theta - v_t)dt + \sigma\sqrt{v_t}dW_t^2,
 \end{aligned}$$

where  $W^1$  and  $W^2$  are two correlated brownian motions with  $\langle W^1, W^2 \rangle_t = \rho t$ , and  $k$ ,  $\theta$  and  $\sigma$  Description of the algorithm is given in [there](#)

## References