```
program main
use random
use constants
implicit none

integer, parameter :: Np = 90000
double precision :: x(1:Np)
double precision :: y, z, sigma
integer :: i, j, k, is
double precision :: delta_t

delta_t = 0.04

do is = 1, 100
x = 0
do i=1, Np
      z = 0

      ! calculation of int_0 ∧ t dwt
      ! t = 1000 * is * delta_t
      ! random_normal() \sim N(0, 1)
      ! random_normal() * sqrt(delta_t) \sim N(0, delta_t)

      do j=1, 1000 * is
            y = random_normal() * sqrt(delta_t)
            z = z + y
      end do
      x(i) = z
end do

sigma=0.0
do i=1, Np
sigma = sigma + x(i) *x(i)
end do

sigma = sigma / Np

write(*, *) 1000 * is * delta_t,    sigma

end do


end program

! output
```

```
!      40.0000000          39.886218159829369
!     80.0000000          79.996277262529361
!     120.000000          120.20720952752026
!     160.000000          159.43002215934550
!     200.000000          199.22156485129372
!     240.000000          239.50377587620795
!     280.000000          280.32426384605839
```