

```
program Mandelbrot
use types, only: dp
use constants, only: i_
use utils, only: savetxt
use mesh, only: linspace, meshgrid
implicit none

integer, parameter :: ITERATIONS = 100
integer, parameter :: DENSITY = 1000
real(dp) :: x_min, x_max, y_min, y_max
real(dp), dimension(DENSITY, DENSITY) :: x, y
complex(dp), dimension(DENSITY, DENSITY) :: c, z
integer, dimension(DENSITY, DENSITY) :: fractal
real(dp), dimension(DENSITY, DENSITY) :: logfractal
integer :: n
x_min = -2.68_dp
x_max = 1.32_dp
y_min = -1.5_dp
y_max = 1.5_dp

call meshgrid(linspace(x_min, x_max, DENSITY), &
              linspace(y_min, y_max, DENSITY), x, y)
c = x + i_*y
z = c
fractal = 255

do n = 1, ITERATIONS
  print "('Iteration ', i0)", n
  where (abs(z) <= 10) z = z**2 + c
  where (fractal == 255 .and. abs(z) > 10) fractal = 254 * (n-1) / ITERATIONS
end do

logfractal = log(real(fractal, dp))

print *, "Saving..."
call savetxt("fractal_ft.dat", logfractal)
call savetxt("coord_ft.dat", reshape([x_min, x_max, y_min, y_max], [4, 1]))

end program
```