

```

1 import numpy as np
2 from InputVariables import iniCond
3
4 gamma = 1.4
5 G = 0.4
6 nw = 3
7 nsnap = 3
8
9 # determines the boundary conditions, xmin, xmax, dx and tmax from
  the initial condition
10 if iniCond == 'acoustic':
11     bc = 'periodic'
12     xmin = 0
13     xmax = 1
14     tmax = 3
15 elif iniCond == 'shock':
16     bc = 'fixed'
17     xmin = -0.5
18     xmax = 0.5
19     tmax = 0.2
20
21 # computes the conservative variables from an array w of primitive
  variables (dimension nw)
22 def rho(w):
23     return w[0]
24
25 def rhov(w):
26     rv = [i * rho(w) for i in w[1:-1]]
27     return rv
28
29 def e(w):
30     return np.dot(w[1:-1], w[1:-1])*rho(w)/2 + w[-1]/(G)
31
32 # computes the primitive variables and the speed of sound from an
  array w of primitive variables (dimension nw)
33 def v(w):
34     speed = [i/rho(w) for i in w[1:-1]]
35     return speed
36
37 def p(w):
38     return (G)*(-(np.dot(w[1:-1], w[1:-1])/(2*rho(w))) + w[-1])
39
40 def csound(w):
41     return np.sqrt((gamma*p(w)/rho(w)))
42

```