Task: Designing Microstrip Transmission Line in Matlab, with following parameters:

Relative permittivity: 4.2
Height: 1.559 mm
Impedance: 50 Ohm
Frequency: 2.4 GHz

```
.li Result                                              ⊡ ⊡ ⊏⊐

$octave -qf --no-window-system demo.m
Ee =  3.2041
f =     2.4000e+09
c = 300000000
d = 90
k = 50.265
l = 0.017458
lcm =  17.458
er =  4.2000
h = 1.5590
When w=3.020000, Value of Z is:50.899203
When w=3.030000, Value of Z is:50.798286
When w=3.040000, Value of Z is:50.697790
When w=3.050000, Value of Z is:50.597712
When w=3.060000, Value of Z is:50.498049
When w=3.070000, Value of Z is:50.398798
When w=3.080000, Value of Z is:50.299956
When w=3.090000, Value of Z is:50.201522
When w=3.100000, Value of Z is:50.103492
When w=3.110000, Value of Z is:50.005863
warning: function ./demo.m shadows a core library function
```

Code Implementation

```
Ee = 3.204078
f = 2.4e9
c = 300000000
d = 90
k = (2*pi()*f)/c
l = (d*pi()/180)/ (sqrt(Ee)*k)
lcm = l * 1000


er = 4.2
h = 1.559 %mm

for w = 0.1:.01:7
        eff = ((er + 1)/2) + ((er - 1) / (2 * sqrt(1 + (12*(h/w)))));

    if w/h <= 1
        Z = ((60 / sqrt(eff)) * log ((8*h/w) + (w/h) ));
    else
        Z = (1 / sqrt(eff)) * ((120*3.14159) / ((w/h) + 1.393 + 0.667 * (log((w/h) + 1.444))));
    end

  if Z < 50.99 && Z > 49.99
     fprintf("When w=%f, Value of Z is:%f\n", w, Z)
  end

end
```