```
options = optimoptions('fmincon', "Display","iter","Algorithm","sqp");
fun = @(x)(x(1) + x(2) + x(3));
lb = [100, 1000, 1000, 10, 10, 10, 10, 10];
ub = [10000, 10000, 10000, 1000, 1000, 1000, 1000, 1000];
A = [];
b = [];
Aeq = [];
beq = [];
```

generate random number and load non linear constraint

```
x0 = randn(8,1,"double")
```

```
x0 = 8×1
   -1.2075
    0.7172
    1.6302
    0.4889
    1.0347
    0.7269
   -0.3034
    0.2939
```

```
nonlcon = @conQ3;
```

solve the equation

```
[x, fval] = fmincon(fun, x0, A, b, Aeq, beq, lb, ub, nonlcon, options)
```

```
Your initial point x0 is not between bounds lb and ub; FMINCON
shifted x0 to satisfy the bounds.
 Iter  Func-count            Fval   Feasibility   Step Length       Norm of    First-order
                                                                       step     optimality
    0           9    2.100000e+03     1.225e+06     1.000e+00     0.000e+00     1.000e+00
    1          18    2.100000e+03     5.387e+00     1.000e+00     8.869e+02     6.452e+02
    2          52    2.100254e+03     5.387e+00     1.341e-04     1.957e-01     6.452e+02
    3          92    2.100284e+03     5.387e+00     1.578e-05     2.319e-02     6.452e+02
    4         131    2.100327e+03     5.387e+00     2.254e-05     3.377e-02     6.452e+02
    5         163    2.100879e+03     5.385e+00     2.737e-04     4.365e-01     6.451e+02
    6         190    2.104596e+03     5.376e+00     1.628e-03     2.924e+00     6.447e+02
    7         199    4.783568e+03     2.164e-07     1.000e+00     2.073e+03     1.109e+02
    8         208    4.703215e+03     7.926e-11     1.000e+00     5.895e+01     5.032e+00
    9         217    4.562402e+03     2.012e-10     1.000e+00     1.024e+02     4.300e+00
   10         226    4.534854e+03     4.004e-11     1.000e+00     1.930e+01     4.300e+00
   11         235    4.468911e+03     2.005e-09     1.000e+00     4.512e+01     4.300e+00
   12         245    4.437674e+03     2.285e-04     1.000e+00     2.092e+01     4.300e+00
   13         254    4.335891e+03     2.186e-09     1.000e+00     6.785e+01     2.972e+00
   14         264    4.329051e+03     0.000e+00     1.000e+00     6.049e+00     1.000e+00
   15         274    4.294884e+03     0.000e+00     1.000e+00     3.023e+01     1.000e+00
   16         284    4.263675e+03     1.776e-15     1.000e+00     2.852e+01     1.349e+00
   17         294    4.255144e+03     0.000e+00     1.000e+00     1.013e+01     2.126e+00
   18         308    4.248812e+03     1.868e-04     2.401e-01     7.452e+00     1.915e+00
   19         321    4.241355e+03     5.376e-04     3.430e-01     8.562e+00     1.255e+00
   20         332    4.229563e+03     1.051e-03     7.000e-01     1.298e+01     1.255e+00
   21         342    4.217127e+03     0.000e+00     1.000e+00     1.261e+01     1.255e+00
   22         356    4.208075e+03     4.604e-04     2.401e-01     9.384e+00     1.255e+00
   23         375    4.200522e+03     7.962e-04     4.035e-02     7.836e+00     1.255e+00
   24         397    4.196869e+03     1.043e-03     1.384e-02     3.957e+00     1.255e+00
   25         407    3.963060e+03     5.630e-11     1.000e+00     3.582e+02     8.969e+00
   26         418    3.942271e+03     0.000e+00     7.000e-01     1.172e+02     7.913e+00
```

```
   27         429    3.930700e+03     1.525e-11     7.000e-01     7.647e+01     6.998e+00
   28         440    3.924293e+03     1.892e-11     7.000e-01     2.119e+01     6.704e+00
   29         451    3.905200e+03     9.861e-12     7.000e-01     1.496e+01     6.520e+00
 Iter  Func-count            Fval   Feasibility   Step Length       Norm of   First-order
                                                                       step    optimality
   30         462    3.821975e+03     0.000e+00     7.000e-01     8.294e+01     5.969e+00
   31         472    3.682481e+03     1.741e-03     1.000e+00     1.416e+02     8.390e-01
   32         482    3.679577e+03     0.000e+00     1.000e+00     8.917e+00     2.559e-01
   33         492    3.670730e+03     0.000e+00     1.000e+00     4.553e+01     2.011e-01
   34         502    3.654445e+03     0.000e+00     1.000e+00     1.420e+02     7.334e-02
   35         511    3.652083e+03     0.000e+00     1.000e+00     2.364e+00     2.234e-02
   36         520    3.652083e+03     0.000e+00     1.000e+00     6.127e-09     4.851e-13

Local minimum found that satisfies the constraints.

Optimization completed because the objective function is non-decreasing in
feasible directions, to within the value of the optimality tolerance,
and constraints are satisfied to within the value of the constraint tolerance.

<stopping criteria details>
x = 8×1
10^3 ×
    0.1000
    1.0000
    2.5521
    0.0100
    0.0100
    0.3900
    0.3142
    0.4900
fval = 3.6521e+03
```