Sample Problem:

```
zdata = [1 2 0.06 0.18;1 3 0.02 0.06;2 3 0.04 0.12]
```

```
zdata = 3×4
    1.0000    2.0000    0.0600    0.1800
    1.0000    3.0000    0.0200    0.0600
    2.0000    3.0000    0.0400    0.1200
```

```
ybus(zdata)
```

```
ans = 3×3 complex
   6.6667 -20.0000i  -1.6667 + 5.0000i  -5.0000 +15.0000i
  -1.6667 + 5.0000i   4.1667 -12.5000i  -2.5000 + 7.5000i
  -5.0000 +15.0000i  -2.5000 + 7.5000i   7.5000 -22.5000i
```

Report problem:

```
zdata1 = [1 2 0 0.125; 1 3 0 0.25; 1 4 0 0.4; 2 3 0 0.25;2 4 0 0.2;3 0 0 1.25;4 0 0
1.25]
```

```
zdata1 = 7×4
    1.0000    2.0000         0    0.1250
    1.0000    3.0000         0    0.2500
    1.0000    4.0000         0    0.4000
    2.0000    3.0000         0    0.2500
    2.0000    4.0000         0    0.2000
    3.0000         0         0    1.2500
    4.0000         0         0    1.2500
```

```
ybus(zdata1)
```

```
ans = 4×4 complex
   0.0000 -14.5000i   0.0000 + 8.000
   0.0000 + 8.0000i   0.0000 -17.000
   0.0000 + 4.0000i   0.0000 + 4.000
   0.0000 + 2.5000i   0.0000 + 5.000
```

```
function [Ybus] = ybus(zdata)
     nl = zdata(:,1);
     nr = zdata(:,2);
     R = zdata(:,3);
     X = zdata(:,4);
     nbr = length(zdata(:,1));
     nbus = max(max(nl),max(nr));
     Z = R + 1j*X;
     y = 1./Z;
     Ybus = zeros(nbus);
     for k = 1:nbr
         if nl(k)>0 && nr(k)>0
             Ybus(nl(k),nr(k)) = Ybus(nl(k),nr(k)) - y(k);
             Ybus(nr(k),nl(k)) = Ybus(nl(k),nr(k)); %Due to symmetry
         end
         end
```

```
        for n = 1:nbus
            for k = 1:nbr
                if nl(k) == n || nr(k) == n
                Ybus(n,n) = Ybus(n,n) + y(k);
            end
        end
    end
end
```