```matlab
clear
clc
fprintf('Given Data: \n');
data =[1    1    0    0.2;
       2    2    1    0.4;
       3    3    1    0.6;
       4    4    2    0.5];
    display(data);
    element=data(:,1);
    nbr = length(element);
    from = data(:,2);
    to = data(:,3);
    zb = data(:,4);
    n = max(max(from),max(to));
    zbus = zeros(n,n);
    for i = 1:nbr
    %modification-1
    if(element(i) == 1)
        zbus = zb(i);
        continue
    end
    %modification-2
    if from(i)~=0 && to(i)~=0 && from(i)>to(i)
        old = to(i);
        new = from(i);
        for p = 1:length(zbus)
            zbus(new,p) = zbus(old,p);
            zbus(p,new) = zbus(p,old);
        end
        zbus(new,new) = zbus(old,old)+zb(i);
        continue
    end
    %modification-3
    if from(i) == 0
        old =to(i);
        m1 = zbus(old,old) + zb(i);
        ztemp = (1/m1) *zbus(:,old)*zbus(old,:);
        zbus = zbus - ztemp;
        continue
    end
    %modification-4
    if from(i)~=0 && to(i)~=0 && from(i)<to(i)
        a= from(i);
        b = to(i);
        m2 = zb(i) + zbus(a,a)+zbus(b,b) - (2*zbus(a,b));
        ztemp = (1/m2) * ( zbus(:,a) - zbus(:,b) )* ( zbus(a,:) - zbus(b,:) );
        zbus = zbus - ztemp;
        continue
    end
    end
    fprintf('Z-bus Matrix: \n');
    disp(zbus)
```

```
Given Data:

data =

    1.0000    1.0000         0    0.2000
    2.0000    2.0000    1.0000    0.4000
    3.0000    3.0000    1.0000    0.6000
    4.0000    4.0000    2.0000    0.5000

Z-bus Matrix:
    0.2000    0.2000    0.2000    0.2000
    0.2000    0.6000    0.2000    0.6000
    0.2000    0.2000    0.8000    0.2000
    0.2000    0.6000    0.2000    1.1000
```