```matlab
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%Formation of Z bus using Building Algorithm without mutual coupling
clc; clear all;
%     Element F.B T.B    Z
data=[  1     1   0    0.2
        2     2   1    0.3
        3     3   1    0.35
        4     2   0    0.25
        5     2   3    0.1  ];
 element= data(:,1);
 nbr= length(data(:,1));
 from= data(:,2);
 to= data(:,3);
 zb= data(:,4);
 n= max(max(from),max(to)); %No of Buses
 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)
            if(from(i)>to(i))
                k=to(i);
                new=from(i);
                for j=1:2
                    zbus(j,new)=zbus(j,k);
                    zbus(new,j)=zbus(k,j);
                end
                zbus(new,new)=zbus(k,k)+zb(i)
                continue
            end
        end

        %Modification-3
        if(to(i)==0)
            old=from(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)
            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\n');
```

```
zbus =

    0.2000
```

```
zbus =

    0.2000    0.2000
    0.2000    0.5000


zbus =

    0.2000    0.2000    0.2000
    0.2000    0.5000    0.2000
    0.2000    0.2000    0.5500


zbus =

    0.1467    0.0667    0.1467
    0.0667    0.1667    0.0667
    0.1467    0.0667    0.4967


zbus =

    0.1365    0.0794    0.0921
    0.0794    0.1508    0.1349
    0.0921    0.1349    0.2032

  z-bus
```