

Supplementary A

```
clc
clear
l=1000; %link length in mm
w=117.2; %gripper weight in Newtons
i=1;
A=[100:50:900];
D1=zeros(1,17); Q1=zeros(17,17);
D2=zeros(1,17); Q2=zeros(17,17);
D3=zeros(1,17); Q3=zeros(17,17);

j=1;
for a=100:50:900 %distance between gripper and links
in xy plane
    T=w.*a./1000; %Torque
    for x=100:50:900 %distance between gripper and
supports in yz plane

Bz=(w.*x)./1000; % reaction of support far from gripper
Az=w-Bz; %reaction of support near gripper

D1(i)=T;
D2(i)=Az;
D3(i)=Bz;
i=i+1;
end

Q1(j,:)=D1; %Torque over both distance in x and z
directions
Q2(j,:)=D2; %support reaction y-axis over both
distance in x and z directions
Q3(j,:)=D3; %support reaction Y-axis over both
distance in x and z directions
j=j+1;
i=1;
end
figure
for j=1:1:17
    plot (A,Q2(j,:))
```

```
    hold on
xlabel 'x(mm) '
ylabel 'Az(N) '
grid on
end
```

```
figure
for j=1:1:17
    plot (A,Q3(j,:))
    hold on
xlabel 'x(mm) '
ylabel 'Bz(N) '
grid on
end
figure
for j=1:1:17
    plot (A,Q1(j,:))
    hold on
xlabel 'x(mm) '
ylabel 'T(N.m) '
grid on
end
```