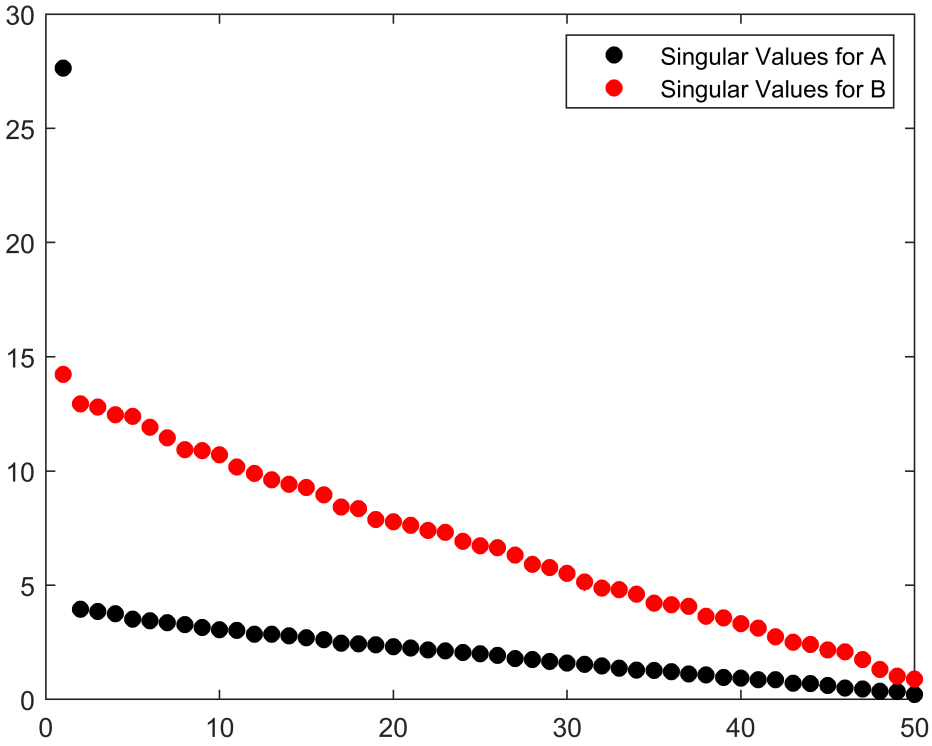
Notes for Matlab Math 210 Homework #8

I know I will get 50 singular values from each random matrix - why?

```
clearvars
A=rand(60,50); B=randn(60,50);
sa=svd(A); sb=svd(B);
x=1:1:50;
plot(x,sa,'ko','markerfacecolor','k')
hold on
plot(x,sb,'ro','markerfacecolor','r')
legend('Singular Values for A', 'Singular Values for B')
hold off
```



The homework assignment did not ask you to do this second part but I wanted to know what would happen if I plotted the mean singular values in descending order using 100 samples. Notice how the mean of 100 random samples looks very much like the single sample that I found above; the curves are smoothed out a bit, but the uniform distribution still has one very big singular value while the normal distribution does not have such an outlier.

```
ma=zeros(50,1); mb=zeros(50,1);
for i=1:100
  A=rand(60,50); B=randn(60,50);
sa=svd(A); sb=svd(B);
```

```
ma=ma+sa; mb=mb+sb;
end
ma=ma./100; mb=mb./100;
plot(x,ma,'ko','markerfacecolor','k')
hold on
plot(x,mb,'ro','markerfacecolor','r')
legend('Singular Values for A', 'Singular Values for B')
```