

2.

```
data = [-0.4326;-1.6656;0.1253;0.2877;-1.1465;1.1909;1.1892;-0.0376;0.3273;0.1746];  
n = length(data);  
%Sample mean  
Sample_mean = mean(data)
```

```
Sample_mean = 0.0013
```

```
%Standard deviation  
standard_deviation = std(data)
```

```
standard_deviation = 0.9034
```

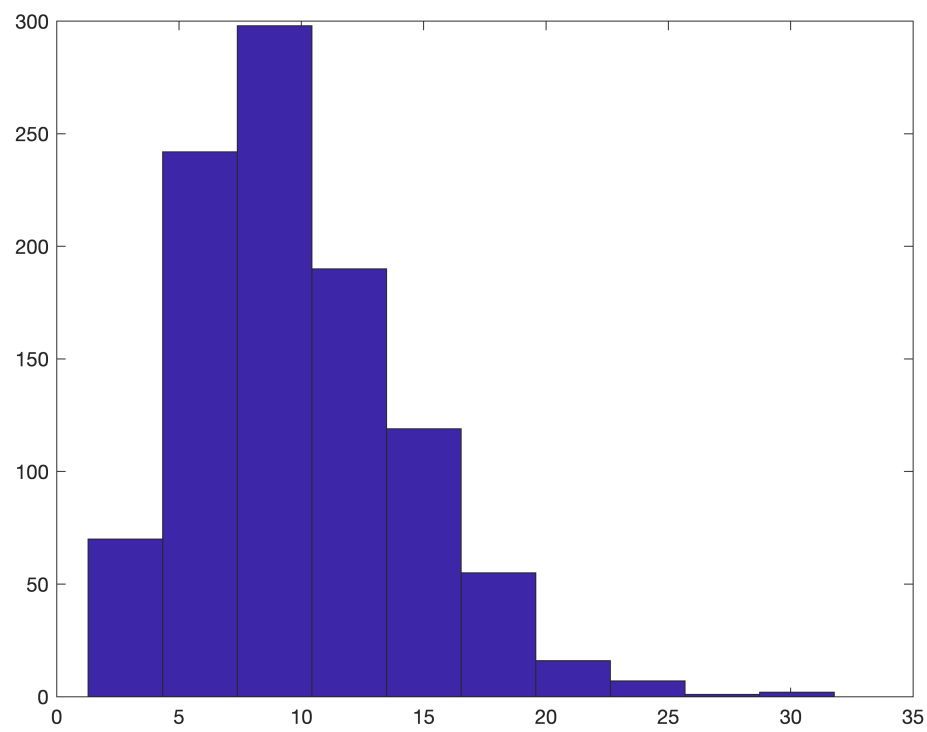
```
% Confidence interval  
ci = 0.95;  
top = 1-(1-ci)/2;  
bottom = (1-ci)/2;  
t_top = tinv(top,n-1);  
t_bottom = tinv(bottom,n-1);
```

```
Confidence_interval = [Sample_mean+(t_bottom*standard_deviation)/sqrt(n) Sample_mean+(
```

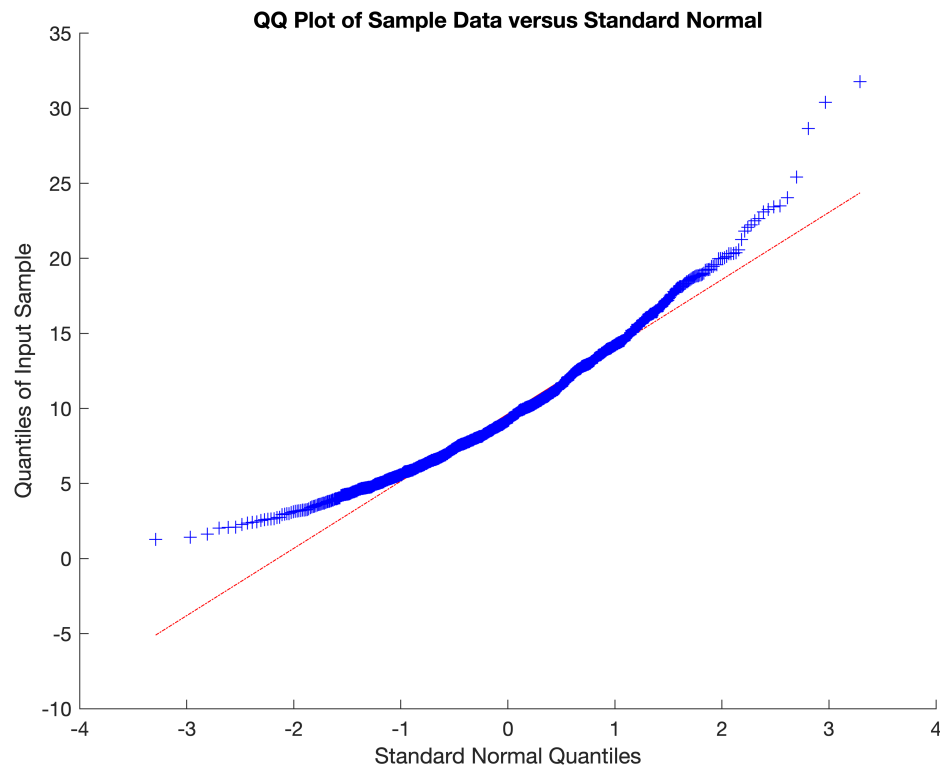
```
Confidence_interval = 1×2  
-0.6450 0.6475
```

3.

```
N = 1000;  
n5 = 5; n50 = 50;  
[m5] = generate(N,n5);  
[m50] = generate(N,n50);  
figure(1)  
hist(m5)
```



```
figure(2)  
qqplot(m5)
```



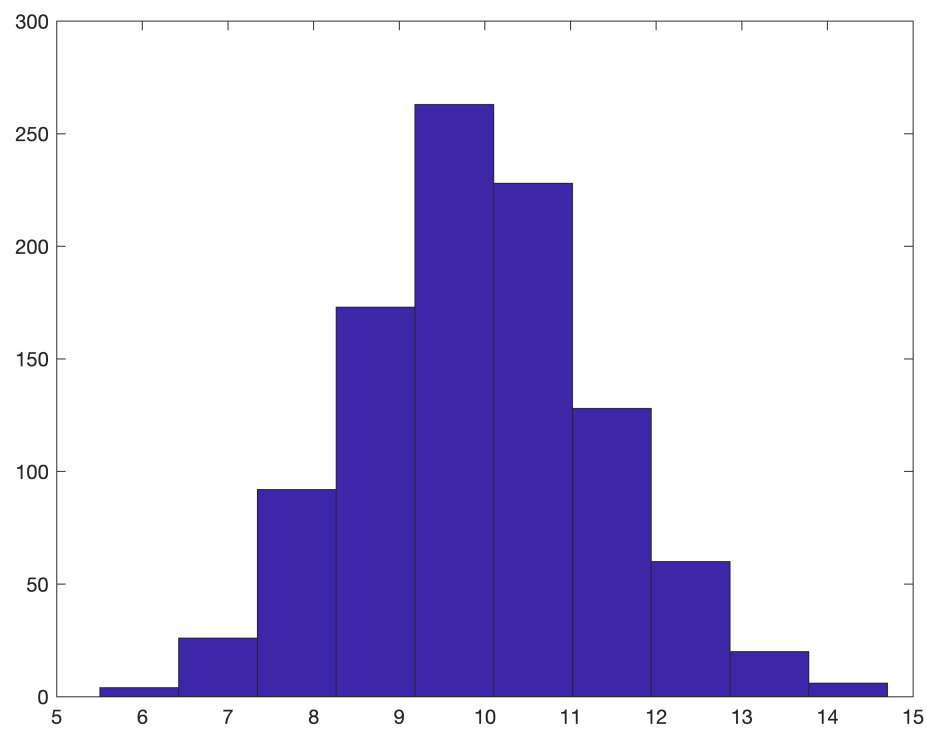
The histogram and Q-Q plot above show that the averages are not approximately normally distributed.

This is so because from the histogram we can see that it is skewed to the right (there is a sharp drop on the left and a slow one on the right) and not symmetric about the mean as it would have if the averages were normally distributed.

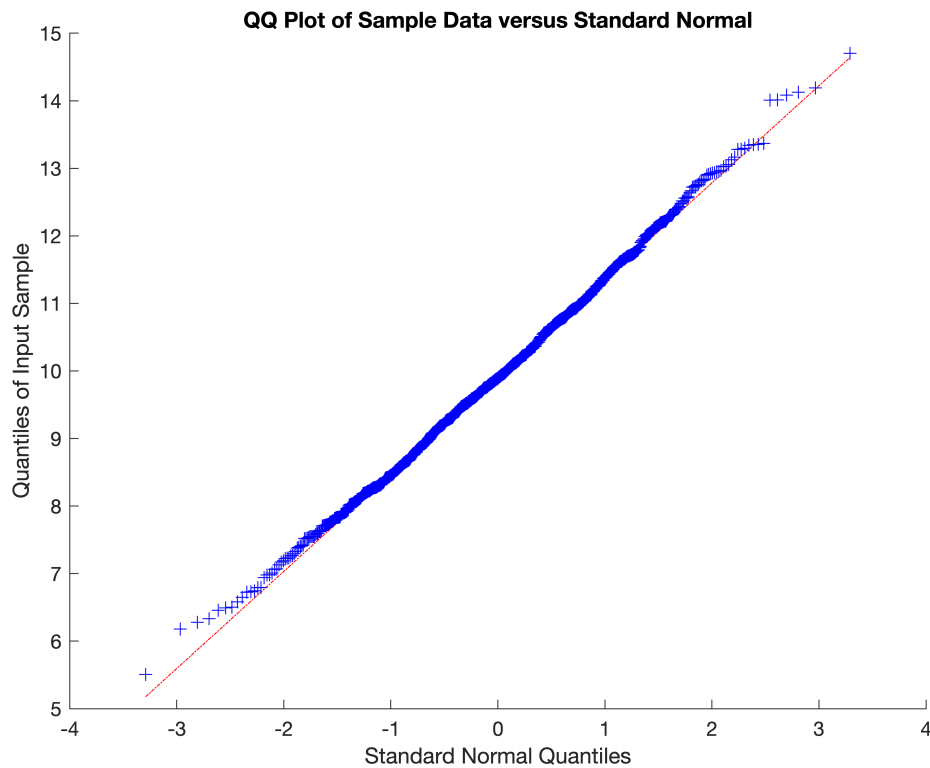
From the Q-Q plot, we see a curvature formed by plot of the averages and since they don't follow a straight line this clearly shows that the averages are not normally distributed since normally distributed data appears as roughly a straight line.

4.

```
figure(3)
hist(m50)
```



```
figure(4)  
qqplot(m50)
```



For this case, the histogram and Q-Qplot show that the averages are approximately normally distributed.

This is so because from the histogram we can see that although the result is not perfectly symmetric, the mean, median and mode are almost around the same point and we also see that there is no longer the combination of a sharp drop on one side and a slow decline on the other.

From the Q-Q plot we can see a that the plot roughly follows a straight diagonal line (although the ends of the plot often start to deviate from the straight line) and this show that the averages are approximately normally distributed.

```
function [ave] = generate(N,n)
    ave = [];
    for i=1:N
        m = mean(exprnd(10,n,1));
        ave = [ave m];
    end
end
```