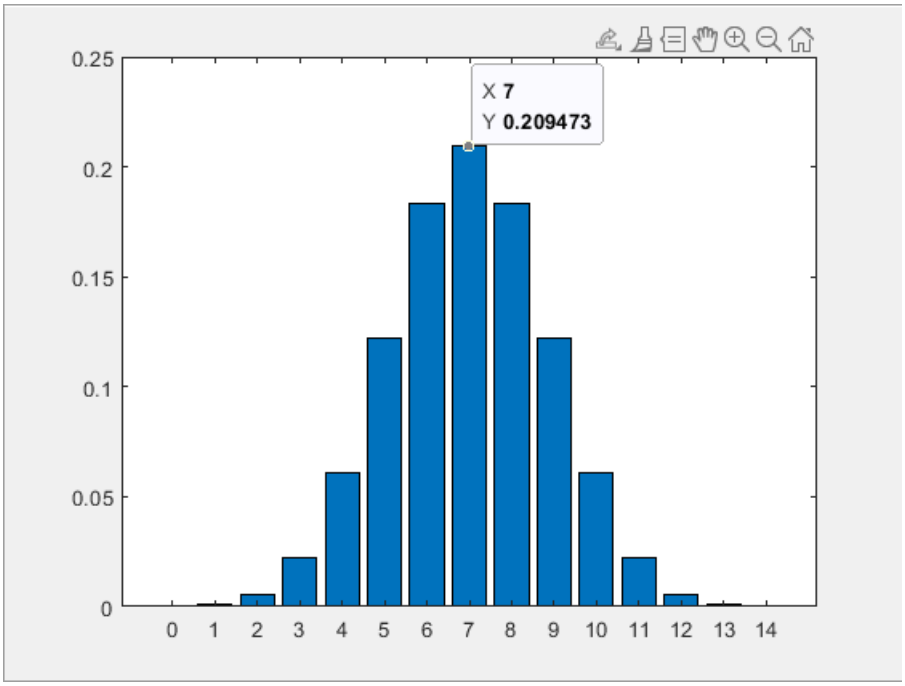
## Q1

Mean value = 7

```
X = 0:14

P = factorial(14)./(factorial(14-X).*factorial(X))*0.5^14
```



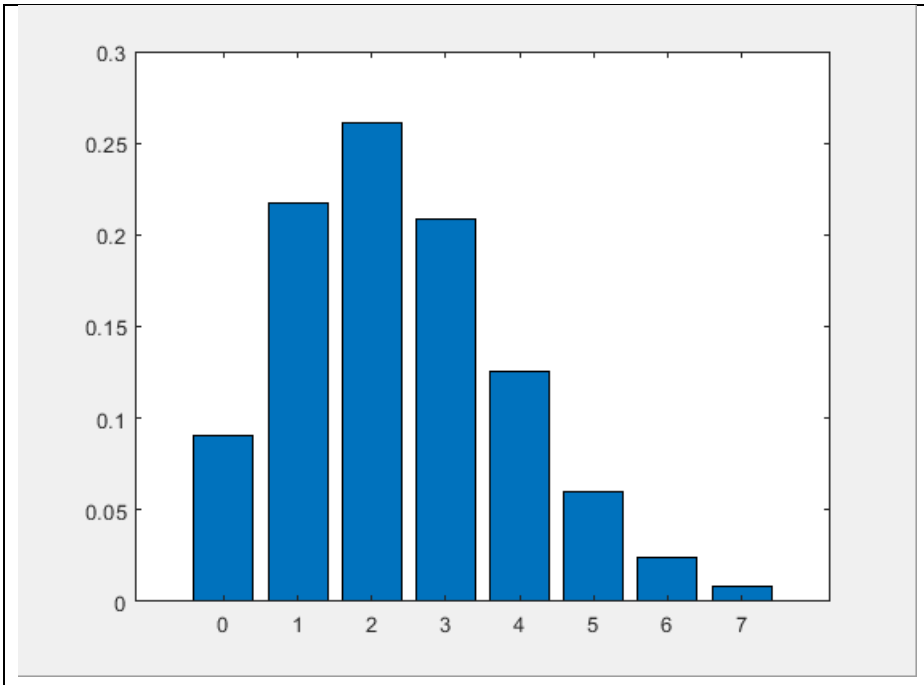

```
N = X.*P

sum(N)

ans = 7
```

Standard Deviation = =1.8708

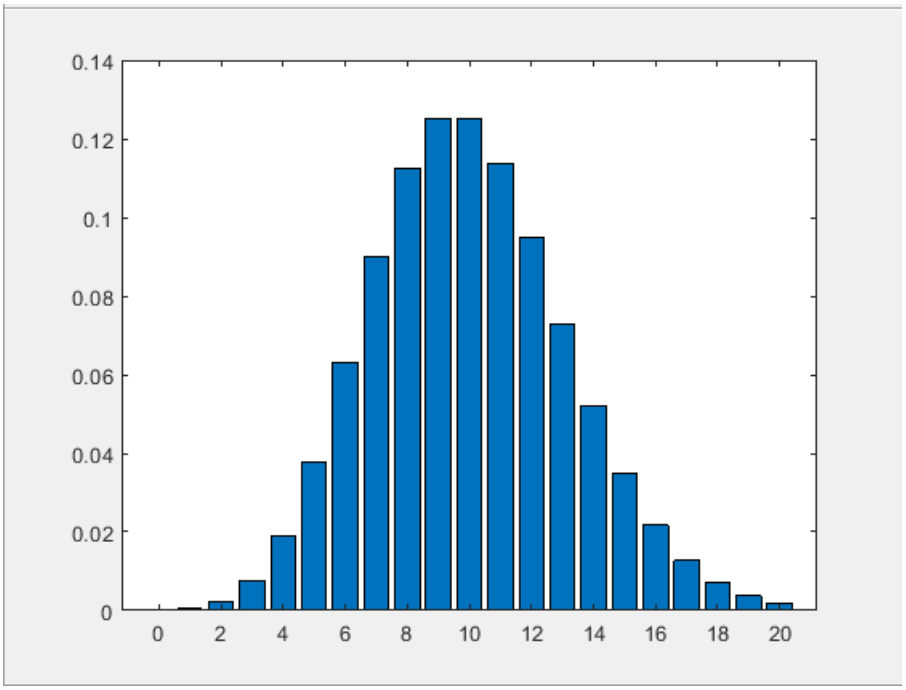
```
VAR = P.*(X-mean).^2

sqrt(sum(VAR))

ans =1.8708
```

## Q2

```
x = 0:7
y = (exp(-2.4)*2.4.^x)./factorial(x)
sum(y)
ans =0.9967
```

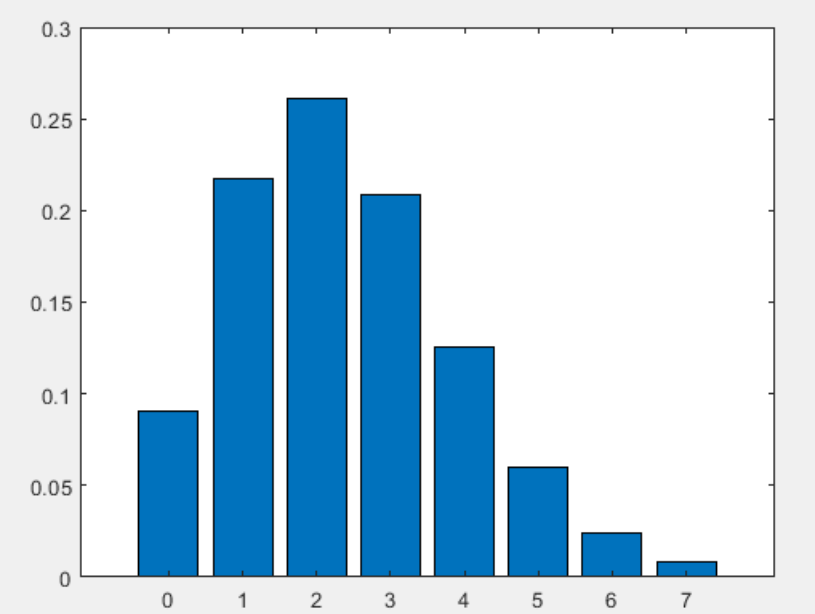



x = [0:1:20]
y=(exp(-10)*10.^x)./factorial(x)
sum(y)
ans = 0.9984




The peak value appears at 10 and shifts to the right. Will it be further to the right to become skew-to-the-left?
不會，當 p=1 時會呈現鐘形分佈。

```
X = 0:7
Y = poisspdf(X,2.4)
bar(X,Y)
```




```
Y = poisscdf(0,2.4)
Y =0.0907
Y = poisscdf(1,2.4)
Y =0.3084
Y = poisscdf(2,2.4)
Y =0.5697
Y = poisscdf(3,2.4)
Y =0.7787
>> poissinv(0.5,2.4)
ans =2
>> poissinv(0.75,2.4)
ans =3
>> poissinv(0.9,2.4)
ans =4
```

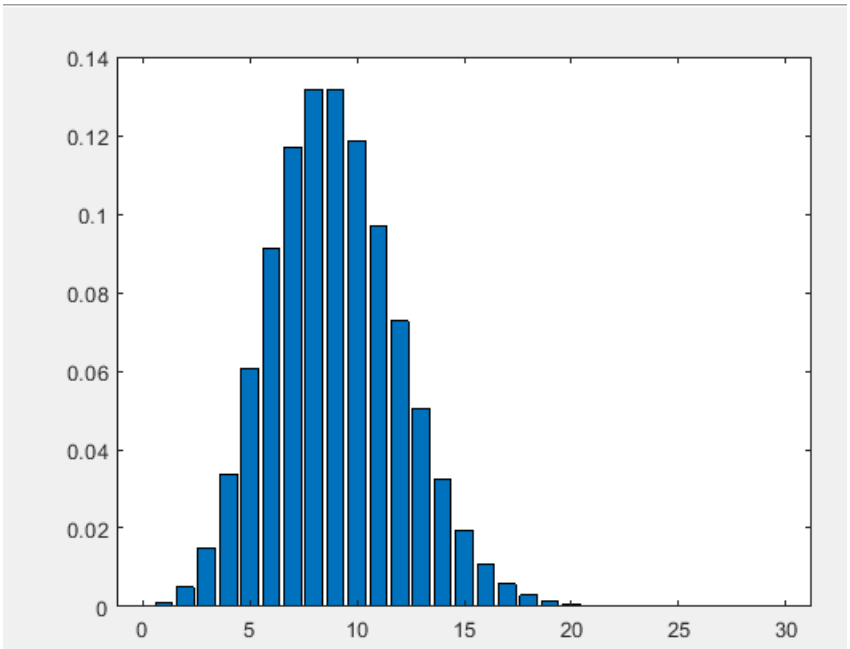
## Q3

```
>> lambda=6*(90/60)
lambda =9
>> poisspdf(7, lambda)
ans =
0.1171
```

```
>> 1-poisscdf(9, lambda)
ans =0.4126
```

What are MATLAB commands to produce this graph?

```
lambda = 6*(90/60)
x = [0:30]
P = poisspdf(x,lambda)
bar(x,P)
```

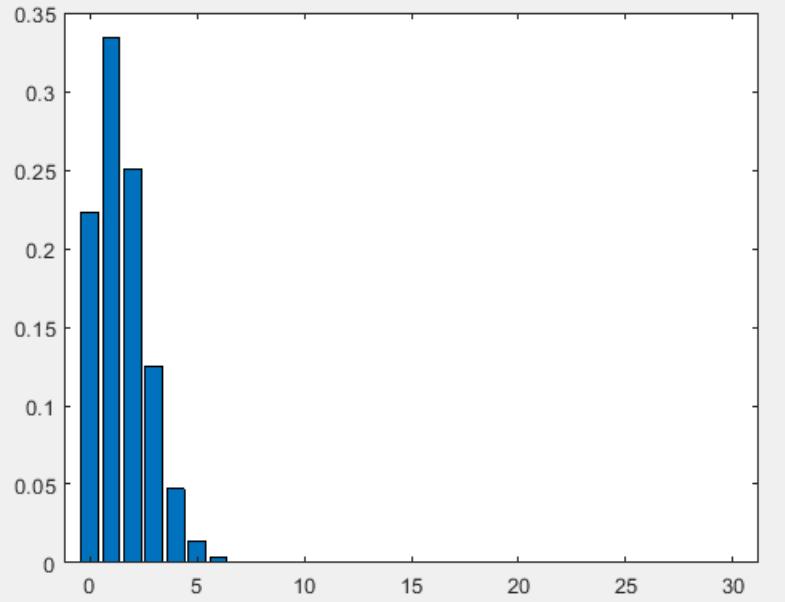



## Q4

```
>> lambda=6*(15/60)
lambda =1.5000
>> 1-poisscdf(0, lambda)
ans = 0.7769
```

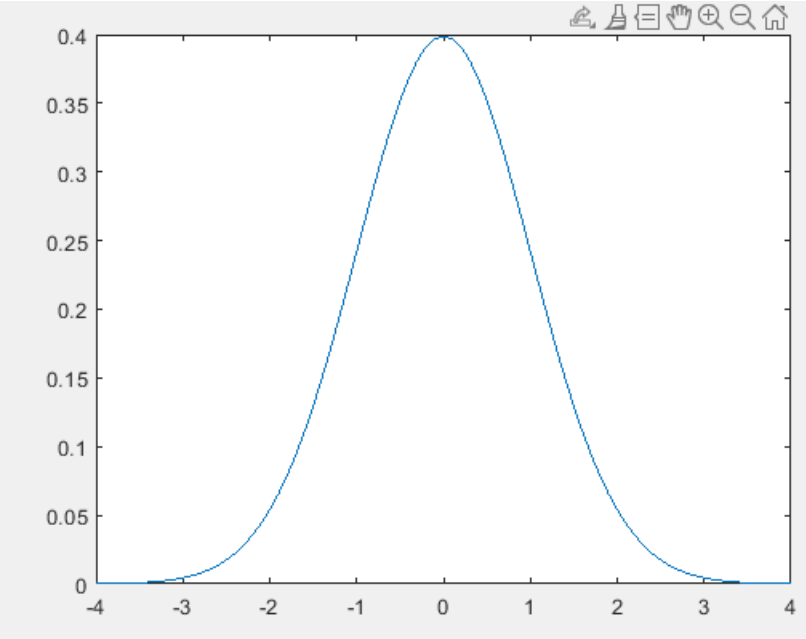
What are MATLAB commands to produce this graph?

```
lambda = 6*(15/60)
x = [0:30]
P = poisspdf(x,lambda)
bar(x,P)
```




## Q5

```
>> x = [-4:0.1:4]
>> y = 1/(sqrt(2*pi))*exp(-0.5.*x.*x)
```




Given a standard normal distribution.

• What is the probability between x=0 to 2?

```
syms f
syms x
f=1/(sqrt(2*pi))*exp(-0.5*x*x)
int(f,0,2)
```

```
double(ans)
ans =0.4772
```

• What is the accumulated probability from –∞ to 1?

```
方法一
int(f,-Inf,1)
double(ans)
ans =0.8413
方法二
>> normcdf(1)
ans =0.8413
```

• What is the value of x to given a probability of 0.95 from x = –∞?

```
>> norminv(0.95)
ans =0.6449
```