The SAS function that calculates the probability $P(X \leq k)$ of a binomial distributed random variable $X \sim B(n, p)$ is `probbnml(p, n, k)`, where

- $n$ = # of observations
- $p$ = probability of the desired output
- $k$ = an instance of the variable $X$; it takes a value between 0 and $n$

**Example 1:**
Assume that $X \sim B(6, .3)$ and we want to calculate $P(X \leq 2)$:

- a) Without SAS, using only Table C (Binomial distribution table), we obtain:
  $$P(X \leq 2) = P(X=0) + P(X=1) + P(X=2) = 0.0008 + 0.0068 + 0.0278 = 0.0354$$
- b) With SAS, you need only to use `probbnml(.3, 20, 2)`

The SAS code:
```
data;
y=probbnml(.3,20,2);
data lines;
proc print;
run;
```

The output is:

<table>
<thead>
<tr>
<th>Obs</th>
<th>y</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.035489</td>
</tr>
</tbody>
</table>

**Example 2:**
Assume that $X \sim B(6, .3)$ and we want to calculate $P(X=2)$:

- a) Without SAS, using only Table C (Binomial distribution table), we obtain:
  $$P(X=2) = 0.0278$$
- b) With SAS, $P(X=2) = P(X \leq 2) - P(X \leq 1) = \text{probbnml(.3, 20, 2)} - \text{probbnml(.3, 20, 1)}$

The SAS code:
```
data;
x=probbnml(.3,20,2)-probbnml(.3,20,1);
data lines;
proc print;
run;
```

The output is:

<table>
<thead>
<tr>
<th>Obs</th>
<th>x</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.027846</td>
</tr>
</tbody>
</table>