

5.14

$$(a) \quad P(X=4) = b(4; 4, 0.9) = \sum_{x=0}^4 b(x; 4, 0.9) - \sum_{x=0}^3 b(x; 4, 0.9)$$

$$= 1 - 0.3439 = 0.6561$$

(b) They play 4, 5, 6, 7 games to win

$$0.6561 + C_3^4 (0.9)^4 (0.1) + C_3^5 (0.9)^4 (0.1)^2 + C_3^6 (0.9)^4 (0.1)^3$$

$$= 0.9973$$

(c) bull's win probability is 90%, so that the table can be use

5.26

$$P = \frac{3}{5}$$

$$(a) \quad C_6^8 \left(\frac{3}{5}\right)^6 \left(\frac{2}{5}\right)^2 = 0.209$$

$$(b) \quad \sum_{x=0}^6 b(x; 8, 0.6) - \sum_{x=0}^5 b(x; 8, 0.6)$$

$$= 0.8936 - 0.6846 = 0.209$$

5.50

$$(a) \quad b^*(7; 3, 0.5) = C_2^6 (0.5)^3 (0.5)^4 = 0.117$$

$$(b) \quad b^*(4; 1, 0.5) = C_0^3 (0.5)^1 (0.5)^3 = 0.0625$$

5,5b

$$(a) P(5,3) = \frac{e^{-3} 3^5}{5!} = \sum_{x=0}^5 P(x,3) - \sum_{x=0}^4 P(x,3) = 0,9161 - 0,8153 = 0,1008$$

$$(b) \sum_{x=0}^2 P(x,3) = 0,4232$$

$$(c) 1 - \sum_{x=0}^1 P(x,3) = 0,8009$$

5,80

$$(a) \sum_{x=0}^4 P(x,2,7) = \sum_{x=0}^4 \frac{e^{-2,7} (2,7)^x}{x!} = 0,8629$$

$$(b) \sum_{x=0}^1 P(x,2,7) = \sum_{x=0}^1 \frac{e^{-2,7} (2,7)^x}{x!} = 0,2487$$

$$(c) 1 - \sum_{x=0}^{10} P(x,13,5) = 1 - \sum_{x=0}^{10} \frac{e^{-13,5} (13,5)^x}{x!} = 1 - 0,2112 = 0,7888$$

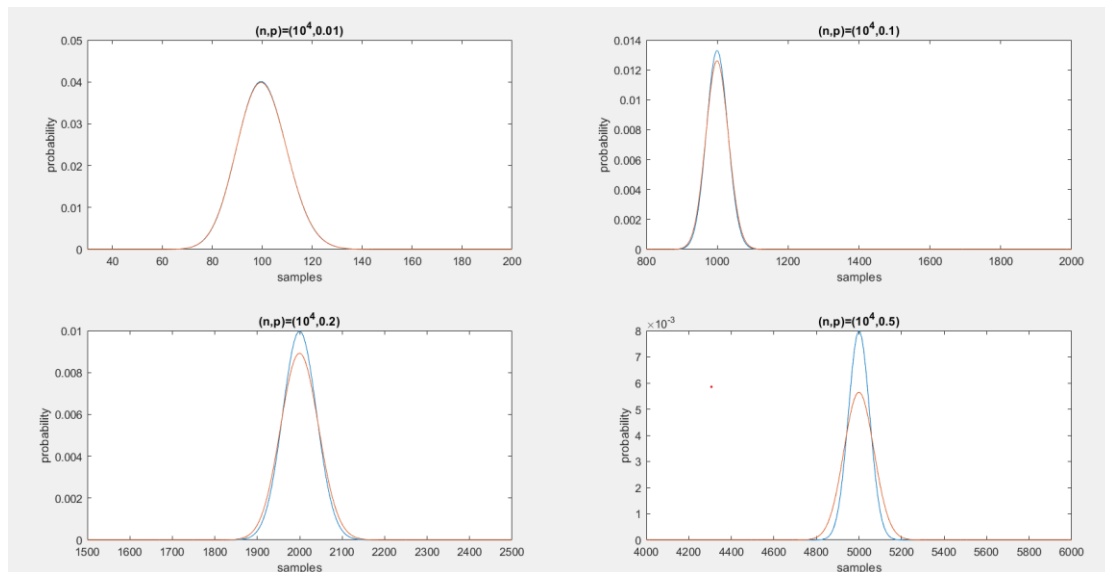
1(c)

n	x	p=0.1	p=0.2	p=0.25	p=0.3	p=0.4	p=0.5	p=0.6	p=0.7	p=0.8	p=0.9
1	0	0.9	0.8	0.75	0.7	0.6	0.5	0.4	0.3	0.2	0.1
1	1	1	1	1	1	1	1	1	1	1	1
2	0	0.81	0.64	0.5625	0.49	0.36	0.25	0.16	0.09	0.04	0.01
2	1	0.99	0.96	0.9375	0.91	0.84	0.75	0.64	0.51	0.36	0.19
2	2	1	1	1	1	1	1	1	1	1	1
3	0	0.729	0.512	0.42188	0.343	0.216	0.125	0.064	0.027	0.008	0.001
3	1	0.972	0.896	0.84375	0.784	0.648	0.5	0.352	0.216	0.104	0.028
3	2	0.999	0.992	0.98438	0.973	0.936	0.875	0.784	0.657	0.488	0.271
3	3	1	1	1	1	1	1	1	1	1	1
4	0	0.6561	0.4096	0.31641	0.2401	0.1296	0.0625	0.0256	0.0081	0.0016	0.0001
4	1	0.9477	0.8192	0.73828	0.6517	0.4752	0.3125	0.1792	0.0837	0.0272	0.0037
4	2	0.9963	0.9728	0.94922	0.9163	0.8208	0.6875	0.5248	0.3483	0.1808	0.0523
4	3	0.9999	0.9984	0.99609	0.9919	0.9744	0.9375	0.8704	0.7599	0.5904	0.3439
4	4	1	1	1	1	1	1	1	1	1	1
5	0	0.59049	0.32768	0.2373	0.16807	0.07776	0.03125	0.01024	0.00243	0.00032	1e-05
5	1	0.91854	0.73728	0.63281	0.52822	0.33696	0.1875	0.08704	0.03078	0.00672	0.00046
5	2	0.99144	0.94208	0.89648	0.83692	0.68256	0.5	0.31744	0.16308	0.05792	0.00856
5	3	0.99954	0.99328	0.98438	0.96922	0.91296	0.8125	0.66304	0.47178	0.26272	0.08146
5	4	0.99999	0.99968	0.99902	0.99757	0.98976	0.96875	0.92224	0.83193	0.67232	0.40951
5	5	1	1	1	1	1	1	1	1	1	1
6	0	0.53144	0.26214	0.17798	0.11765	0.046656	0.015625	0.004096	0.000729	6.4e-05	1e-06
6	1	0.88574	0.65536	0.53394	0.42017	0.23328	0.10938	0.04096	0.010935	0.0016	5.5e-05
6	2	0.98415	0.90112	0.83057	0.74431	0.54432	0.34375	0.1792	0.07047	0.01696	0.00127
6	3	0.99873	0.98304	0.9624	0.92953	0.8208	0.65625	0.45568	0.25569	0.09888	0.01585
6	4	0.99995	0.9984	0.99536	0.98906	0.95904	0.89062	0.76672	0.57983	0.34464	0.11426
6	5	1	0.99994	0.99976	0.99927	0.9959	0.98438	0.95334	0.88235	0.73786	0.46856
6	6	1	1	1	1	1	1	1	1	1	1
7	0	0.4783	0.20972	0.13348	0.082354	0.027994	0.0078125	0.0016384	0.0002187	1.28e-05	1e-07
7	1	0.85031	0.57672	0.44495	0.32942	0.15863	0.0625	0.018842	0.0037908	0.0003712	6.4e-06
7	2	0.97431	0.85197	0.75641	0.64707	0.4199	0.22656	0.096256	0.028796	0.004672	0.0001765
7	3	0.99727	0.96666	0.92944	0.87396	0.71021	0.5	0.28979	0.12604	0.033344	0.002728
7	4	0.99982	0.99533	0.98712	0.9712	0.90374	0.77344	0.5801	0.35293	0.14803	0.025691
7	5	0.99999	0.99963	0.99866	0.99621	0.98116	0.9375	0.84137	0.67058	0.42328	0.14969
7	6	1	0.99999	0.99994	0.99978	0.99836	0.99219	0.97201	0.91765	0.79028	0.5217
7	7	1	1	1	1	1	1	1	1	1	1

1.(d)

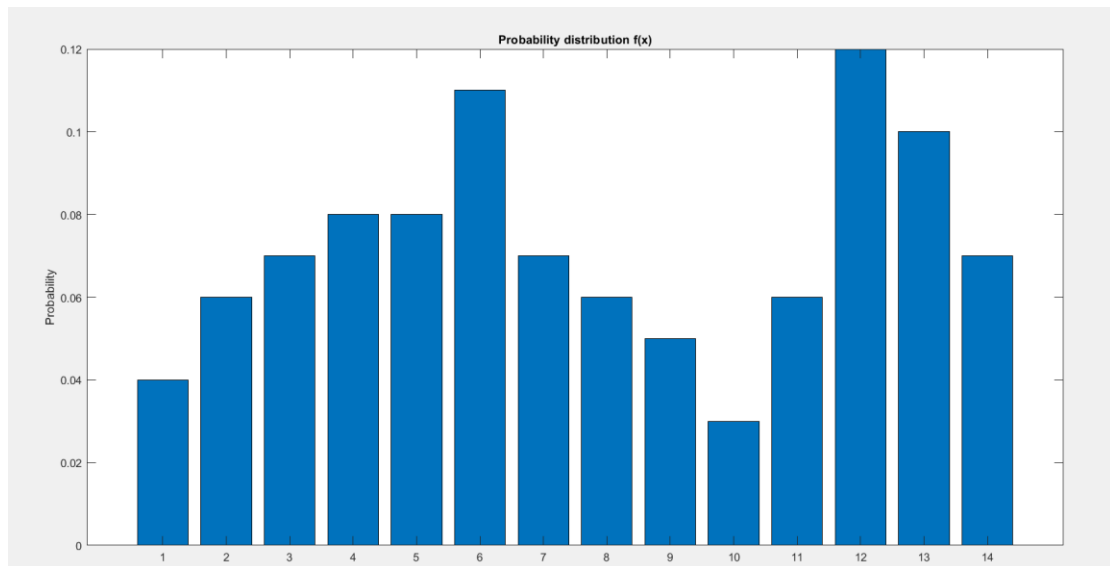
[illegible]

1.(e)

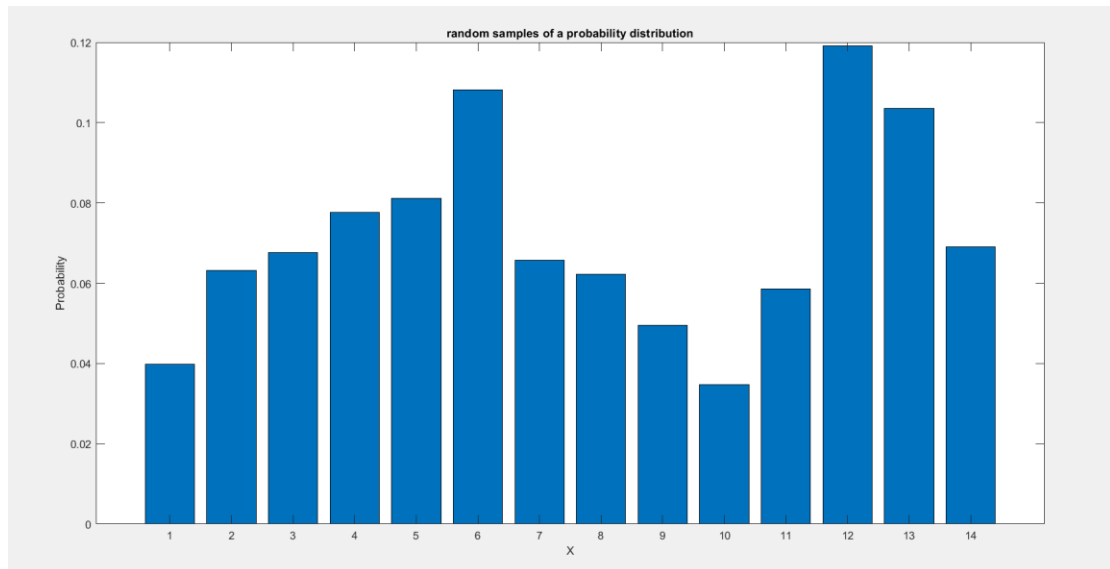


The number of sample space is 10^4 for four plots, as the p goes bigger, the approximation is less accurate. For $p = 0.1$, the two distribution had 0.001 gap. For $p=0.2$, the two distribution had 0.001 gap. For the $p=0.5$, the two distribution had 0.002 gap. Since $n \cdot p$ is the important factor for the precise approximation, as p goes smaller, binomials can be more fit to poisson.

2.(a)



2.(b)



Plots in 2.(a) and 2.(b) look alike since the number of sample is quite big