

2DL HW 7

Taylor 12.2						
	k		O _k	E _k	(O _k -E _k) ² /E _k	
	1	T<8.11	5	4.8	0.008333333	
	2	T<8.15	9	10.2	0.141176471	
	3	T<8.19	13	10.2	0.768627451	
	4	T>8.19	3	4.8	0.675	
			30	30	4.20726E-31	
					1.593137255	
	Since $\chi^2 < n$, there is no reason to doubt the Gauss distribution					
Taylor 12.4						
	Number Sixes	k	O _k	P _k	E _k	
	0	1	217	0.578703704	231.4814815	0.905961481
	1	2	148	0.347222222	138.8888889	0.597688889
	2 or 3	3	35	0.074074074	29.62962963	0.97337963
			400	1	400	2.47703
	Since $\chi^2 < n$, there is no reason to doubt the Gauss distribution					
Taylor 12.10						
	k	O _k	P _k	E _k		
	1	12	0.16	8	2	
	2	13	0.34	17	0.941176471	
	3	11	0.34	17	2.117647059	
	4	14	0.16	8	4.5	
			1	50	9.558823529	
	Reduced $\chi^2 = \chi^2/d =$		9.558823529			
	D=1 because we have 4 bins and 3 constraints (mean and std are calculated from data, and Taylor 12.12)					
	It is less than 0.5% likely that the results are normally distributed.					
	We can reject the Gaussian hypothesis using both the 5% and 1% level.					
Taylor 12.12						
	1 constraint, 3 bins, so d=2					

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	Reduced $\chi^2 = \chi^2/d =$	1.238515			
	It is more than 25% likely that the results follow a binomial distribution				
	Since this probability of getting a larger reduced χ^2 is greater than 5%, we should not assume the dice are loaded.				
Taylor 12.14					
	k	O_k	E_k		
	1	60	56	1	
	2	56	62	2.25	
	3	71	68	0.5625	
	4	66	74	4	
	5	86	80	2.25	
				10.0625	
	d=n-c=5-0				
	Reduced $\chi^2 = \chi^2/d =$	2.0125			
	Probability of larger reduced $\chi^2 = 7.5\%$, so we accept the assumed distribution				