

Homework 2 - STAT 511 - (Questions in R)
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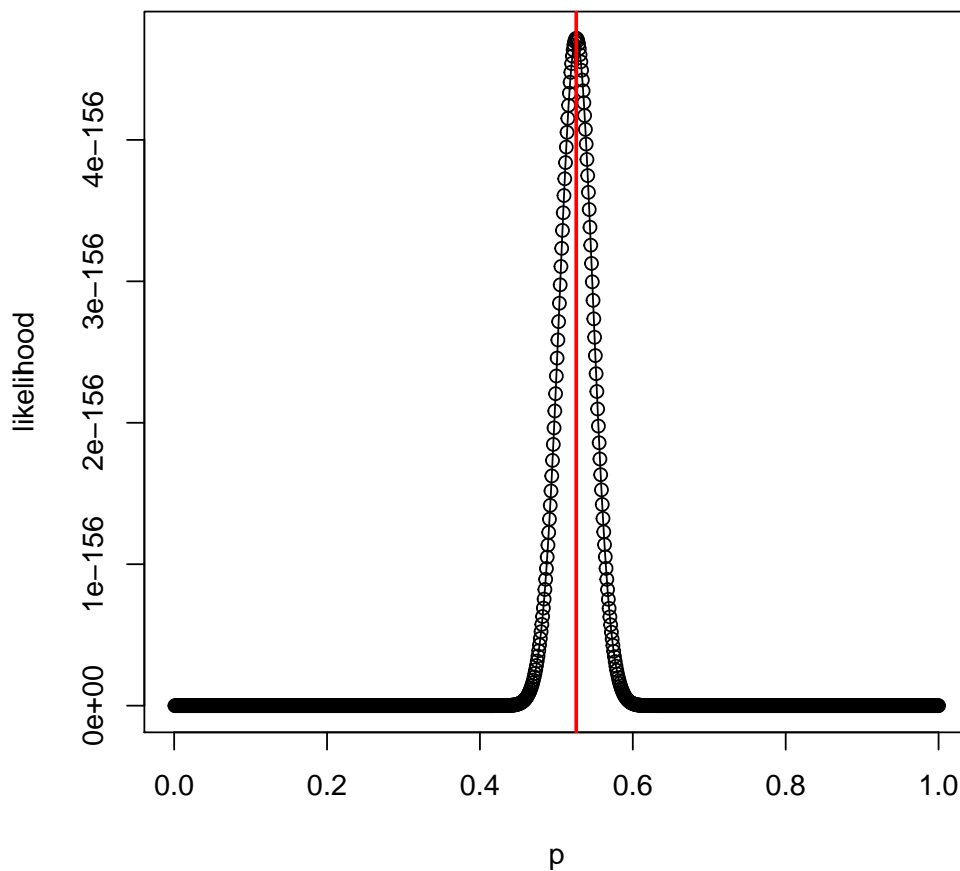
Answer 1(c)

- (a) The MLE calculated using the given data directly and the MLE obtained from the plot of likelihood function vs. p are respectively given as

[1] 0.5261122

[1] 0.526

Plot of likelihood function vs. parameter p



Answer 4(f)

9 realizations of Y for $\sigma = \tau = 1$ are given as:

	[,1]	[,2]	[,3]	[,4]	[,5]	[,6]
[1,]	-0.4223273	-1.1094835	2.1211835	2.2527498	-0.55625209	-2.0863166
[2,]	1.3214603	3.0134466	3.4529991	-0.2971206	-1.25024432	0.9646389
[3,]	0.3389225	-0.6492696	-1.4584103	0.5081058	0.09252057	-1.0705523
[4,]	-1.3691825	0.4085227	-1.6591660	-0.6597774	-0.46132689	-0.3277292
[5,]	0.3868048	0.2391289	0.7882345	-0.3604249	-0.42000648	1.1945585
[6,]	-0.7123342	-1.3706632	-0.7240077	-1.2227066	0.20608792	-0.2261761
[7,]	-0.1131304	-1.0174985	1.3751599	-1.4101252	-1.19622533	-2.0222478
[8,]	-2.1905722	-1.3998160	-1.0668806	-1.9111053	-2.26915750	-1.6223337
[9,]	-0.2128252	-0.6807935	-2.2734067	-2.4226283	-1.62119061	-1.3955373
	[,7]	[,8]	[,9]	[,10]	[,11]	[,12]
[1,]	-0.19833473	0.6180953	-0.5993694	-0.51830728	-2.257335319	-2.39420766
[2,]	-0.51231958	1.2380695	-1.0564356	0.48888948	0.624604261	-1.07735691
[3,]	-1.64247504	-0.5023421	-0.2665972	-2.05685400	-0.283171808	-0.97521666
[4,]	1.00116089	0.4390399	2.6666542	0.08550201	-0.003755992	-1.01163305
[5,]	0.76893340	2.2133261	2.3867591	1.78293617	2.409815848	0.85708344
[6,]	1.33072369	-1.7191783	-1.0990233	-0.69467394	-2.146054195	0.55552431
[7,]	-1.53935085	-1.0696641	0.3852306	-1.16578077	-0.925349605	-0.06995538
[8,]	-2.29935606	-1.0733085	-1.8748946	0.98537601	0.512407310	-0.16711320
[9,]	-0.04864026	0.9962093	-1.2060335	0.84319089	-1.362717305	-0.50076357
	[,13]	[,14]	[,15]	[,16]	[,17]	[,18]
[1,]	-0.97542530	0.80920050	0.5595841	-0.96241531	-0.99926054	1.5784529
[2,]	-0.96090648	1.40804879	-0.6225306	0.18782654	-1.34384158	1.8038887
[3,]	-1.71588713	-2.43264982	-1.9948680	-1.57174039	0.47492913	1.1057876
[4,]	-0.83747303	0.06683405	1.6604521	-0.77098751	1.41976354	1.1422756
[5,]	1.60522132	-1.33721502	-0.5809175	-0.76107591	-1.09955180	2.4308274
[6,]	1.52049472	2.28961448	1.6989177	2.15260723	3.03585706	-1.4781663
[7,]	-1.41004810	-2.41648473	-3.9617433	0.83176613	1.40379824	2.0877839
[8,]	0.51986159	0.28792900	-0.5077620	-0.05525141	1.52236693	-1.0088625
[9,]	-0.01509715	0.25031860	-0.8695980	-0.76022502	-0.06050135	0.2379168
	[,19]	[,20]				
[1,]	0.07855636	1.4974453				
[2,]	-0.68882157	0.6113622				
[3,]	0.63879683	0.1605124				
[4,]	0.81903400	0.4644464				
[5,]	0.50713328	1.5633754				
[6,]	1.43890947	0.1470442				
[7,]	1.54547229	1.8087092				
[8,]	1.10232287	-0.6447887				
[9,]	0.27146306	0.5494226				

Answer 4(g)

9 realizations of Y for $\sigma = 10, \tau = 1$ are given as:

	[,1]	[,2]	[,3]	[,4]	[,5]	[,6]
[1,]	-2.5513010	-2.316634	12.662578	24.3306636	9.05057571	14.7473057
[2,]	-8.2367924	-1.917888	-4.828586	-23.6764489	-7.80123846	-6.9166459
[3,]	8.4347853	23.749706	-2.314998	8.4509041	7.64363709	-11.9844496
[4,]	-0.2215285	-15.514879	-14.315121	-19.1502604	-0.04553649	0.2453858
[5,]	10.0112567	-19.110789	1.754514	2.8366588	-4.22127500	-4.7733345
[6,]	3.2206667	2.873831	-13.131522	-12.1566102	-6.07536055	2.8402956
[7,]	12.9655583	1.981036	5.739943	-5.0467873	11.80965271	8.2798198
[8,]	10.0395260	-3.195844	-1.012456	18.1143218	-15.14804528	2.1848376
[9,]	6.1032226	3.733907	6.294149	-0.9632901	-6.65902307	-4.4110771
	[,7]	[,8]	[,9]	[,10]	[,11]	[,12]
[1,]	-7.784228	-2.35401042	13.9527102	0.4883518	-15.238151	11.6069763
[2,]	-2.770664	-24.57737350	-3.1319825	-1.7604930	-12.765102	3.0638096
[3,]	-1.925012	2.34864595	-4.8930875	-10.5674625	7.349630	-8.6336352
[4,]	5.267098	2.81937508	12.1223109	-1.3935557	-14.516335	-4.2431572
[5,]	6.864818	-9.18957157	-4.9626759	10.3821740	5.504470	-0.4014347
[6,]	-7.251231	-15.51127357	6.5171215	13.6746915	-10.949198	-12.3829077
[7,]	1.963400	-7.64477037	3.1937701	1.3500925	6.971114	8.0308204
[8,]	-10.869317	-11.86382853	0.5441963	-4.8180018	3.325156	-12.2670748
[9,]	-3.785653	-0.04952326	15.2032020	9.1258790	-5.107511	3.2356755
	[,13]	[,14]	[,15]	[,16]	[,17]	[,18]
[1,]	11.460001	-1.5549742	1.617165	6.2812892	7.510202	0.8229973
[2,]	10.687142	2.6548277	-18.414406	0.2605695	1.245281	16.5101514
[3,]	-10.128065	16.0523659	11.186434	-5.7164004	-6.955001	-12.6235151
[4,]	1.208623	10.9800861	11.650455	-4.2775041	3.917240	1.4951379
[5,]	10.658542	-4.9027349	-2.091414	3.6058132	-16.406144	-0.6328887
[6,]	-1.760053	-11.5670894	-12.422124	11.2988411	9.916571	2.7226389
[7,]	-5.635450	-6.9360953	0.889747	-2.1155104	10.939074	7.7077347
[8,]	-8.708915	0.6655690	17.450822	5.3759303	-15.050965	-1.3613525
[9,]	-6.558134	-0.9757124	-4.273851	13.8069407	9.059201	-8.6330048
	[,19]	[,20]				
[1,]	-6.20556227	3.742400				
[2,]	3.27372456	-1.746197				
[3,]	-0.14517150	-7.696521				
[4,]	12.11482871	-7.103939				
[5,]	17.11971306	4.317644				
[6,]	4.02312785	-17.146630				
[7,]	0.04524416	-3.085935				
[8,]	14.22404381	-12.950097				
[9,]	-7.00376585	-13.090150				

Answer 4(h)

9 realizations of Y for $\sigma = 1, \tau = 10$ are given as:

	[,1]	[,2]	[,3]	[,4]	[,5]	[,6]
[1,]	-13.667589	-20.2679075	-13.821877	-11.778836	-11.851648	-18.3474863
[2,]	7.306048	4.9708094	10.219602	4.018004	8.649167	9.1065305
[3,]	14.414489	17.7805264	10.442602	16.484026	15.879542	16.0009474
[4,]	-7.719294	-4.3987747	-5.286546	-8.839495	-4.237285	-6.9149124
[5,]	-2.981393	-3.4853579	-4.179148	-10.606244	-8.609855	-16.4817922
[6,]	7.815893	2.1635104	8.224721	5.778912	7.135026	1.2056390
[7,]	7.091315	14.1819368	17.438183	13.836574	10.240981	8.5511560
[8,]	-3.612980	-0.5307973	2.521473	-3.185597	3.043660	-0.7187022
[9,]	11.307301	12.4323746	16.789825	10.427438	4.832755	9.7649428
	[,7]	[,8]	[,9]	[,10]	[,11]	[,12]
[1,]	-17.825847	-10.165936	-11.562783	-14.6571791	-12.259852	-8.8073447
[2,]	14.251974	16.572705	16.878073	9.4348326	3.600552	4.7133545
[3,]	17.579080	10.586082	10.218731	9.3814930	4.665714	-3.0526236
[4,]	-7.452400	-5.292886	-1.502365	0.1417718	-2.566104	6.2947086
[5,]	-5.395341	-7.346215	1.051313	0.5514113	5.691520	12.5065215
[6,]	5.372219	4.535731	3.258519	-0.8432053	5.782016	10.0560020
[7,]	8.078930	6.450827	5.121730	7.4873054	15.364846	8.7942666
[8,]	1.249173	-2.032297	3.940669	4.0918659	-3.255997	3.0575798
[9,]	9.047663	7.216445	2.951823	6.1343592	1.234888	0.6564199
	[,13]	[,14]	[,15]	[,16]	[,17]	[,18]
[1,]	-7.799941	-5.797913	2.137496	8.5931734	12.0705614	11.0709355
[2,]	3.461371	2.371494	5.480445	2.8775672	7.8617883	8.8397168
[3,]	-3.161658	-4.717086	-1.165675	-4.8300884	-10.3055468	-10.6710789
[4,]	7.798152	13.132047	8.841115	8.2182973	0.4587017	-0.4063861
[5,]	16.752658	12.016115	7.985354	6.9298565	2.0320159	-4.9507307
[6,]	11.316698	16.743215	9.168340	8.3317196	10.7674784	9.0062679
[7,]	6.914647	10.420642	10.069361	2.5249686	6.0893319	3.2632721
[8,]	-1.881671	1.644230	-1.586332	0.9424158	-10.5051912	-7.2176767
[9,]	5.074168	6.731777	11.577223	16.6404653	11.3576468	21.0202827
	[,19]	[,20]				
[1,]	11.948764	10.995526				
[2,]	3.335023	5.914412				
[3,]	-11.706268	-12.651138				
[4,]	-2.602530	1.423212				
[5,]	-10.450468	-7.200422				
[6,]	11.352160	14.211639				
[7,]	8.927637	10.768516				
[8,]	-13.059372	-15.353311				
[9,]	23.147844	22.728977				