

1.

(b)

Estimate A = 0.6587; Estimate B = -0.5515; Estimate C = 0.0735; Estimate D = 0.0051;

minimum variance of A: 0.0056;          minimum variance of B: 0.0012

minimum variance of C: 0.00001897;      minimum variance of D: 0.00000002261

(c)

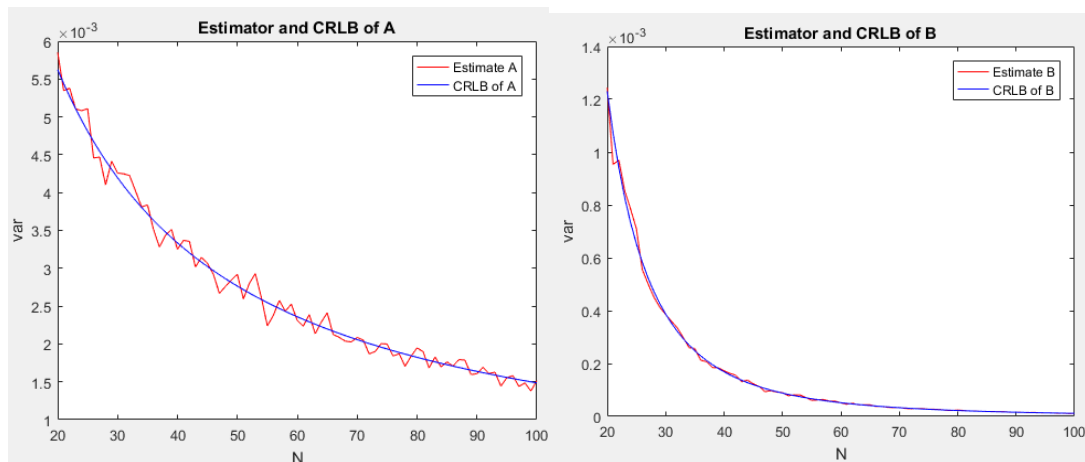
	True value	Estimate mean	MVU estimators	$\sigma^2$
A	0.5	0.5039	0.0056	0.0058
B	-0.5	-0.5010	0.0012	0.0012
C	0.07	0.0701	1.8976e-05	1.9011e-05
D	-0.05	-0.050	2.2661e-08	2.2570e-08

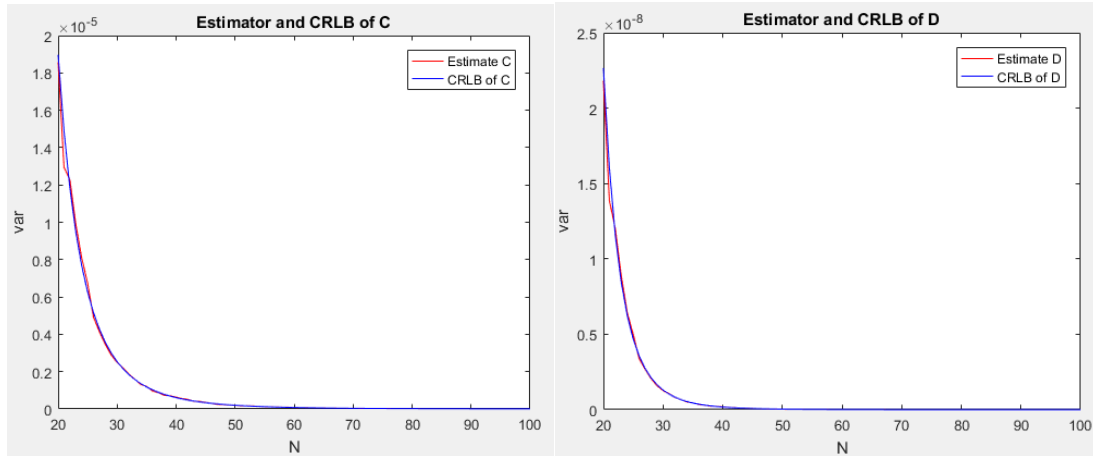
(d)

N=100

	True value	Estimate mean	MVU estimators	$\sigma^2$
A	0.5	0.5000	0.0015	0.0015
B	-0.5	-0.5000	1.1484e-05	1.1709e-05
C	0.07	0.0700	6.3634e-09	6.6075e-09
D	-0.05	-0.050	2.8039e-13	2.9485e-13

(e)





2.

(a) guess order = 2

1. N=20, one realization

Estimate A = -1.0330; Estimate B = 0.5637; Estimate C = -0.0725

minimum variance of A: 0.0037; minimum variance of B: 0.0002

minimum variance of C: 5.6961e-07

2. N=20, 1000 realizations

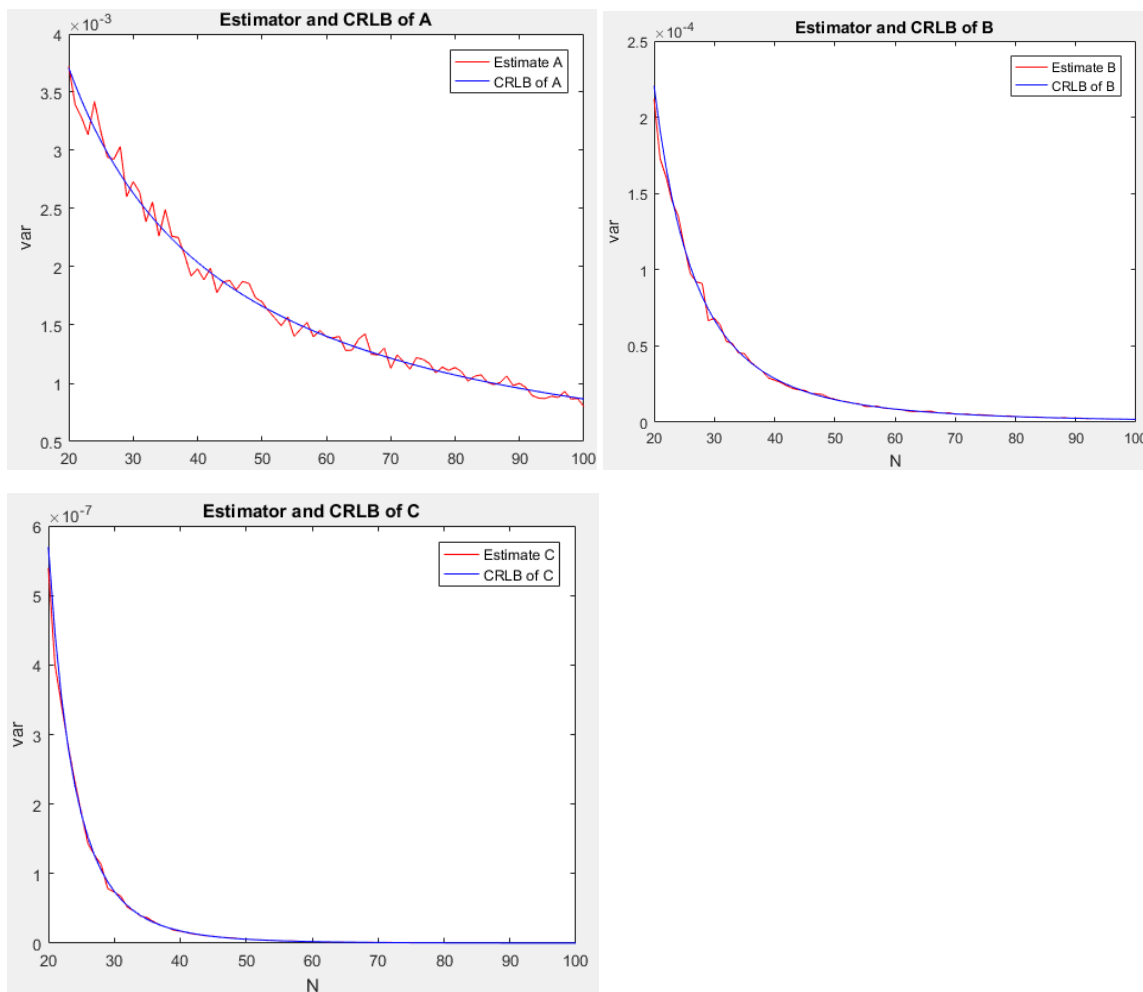
	True value	Estimate mean	MVU estimators	$\sigma^2$
A	0.5	-0.9524	0.0056	0.0058
B	-0.5	0.5557	0.0012	0.0012
C	0.07	-0.0725	1.8976e-05	1.9011e-05

3. N=100, 1000 realizations

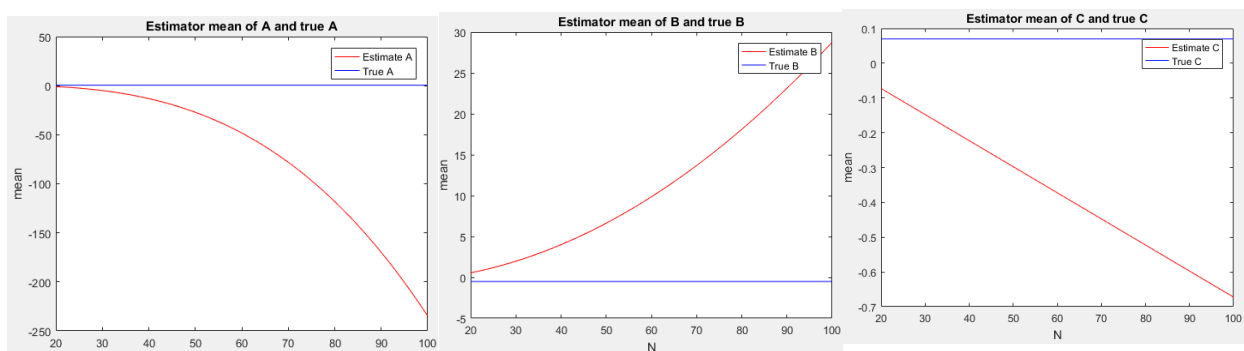
	True value	Estimate mean	MVU estimators	$\sigma^2$
A	0.5	-234.7730	8.6494e-04	8.5996e-04
B	-0.5	28.7555	1.8851e-06	1.9490e-06
C	0.07	-0.6725	1.8009e-10	1.8883e-10

4.  $N=20:1:100$ , 1000 realizations

(i) Compare variance of estimator with CRLB variance



(ii) Compare mean of estimator with real value



(a) guess order = 4

1. N=20, one realization

Estimate A = 0.4913; Estimate B = -0.4856; Estimate C = 0.0680;

Estimate D = -0.0050; Estimate E = 4.8180e-06

minimum variance of A: 0.0073; B: 0.0043; C: 2.1285e-04; D: 1.3648e-06; E: 9.2946e-10

2. N=20, 1000 realizations

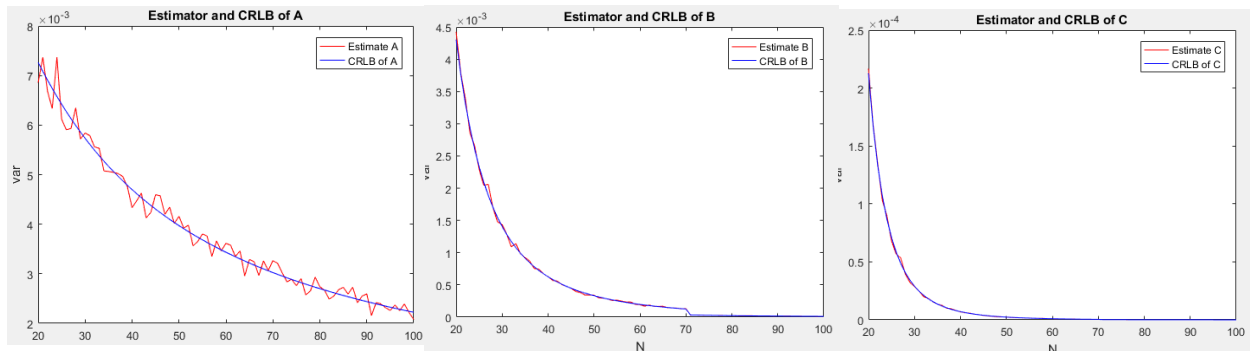
	True value	Estimate mean	MVU estimators	$\sigma^2$
A	0.5	0.5014	0.0073	0.0072
B	-0.5	-0.5018	0.0043	0.0045
C	0.07	0.0705	2.1285e-04	2.2312e-04
D	-0.05	-0.0050	1.3648e-06	1.4123e-06
E	N/A	1.0727e-06	9.2946e-10	9.4642e-10

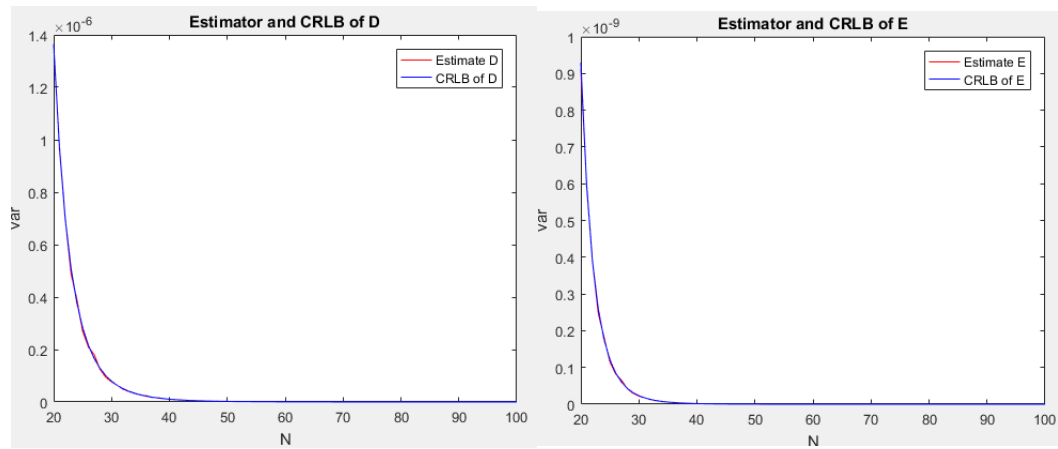
3. N=100, 1000 realizations

	True value	Estimate mean	MVU estimators	$\sigma^2$
A	0.5	-0.0527	1.7450e-07	1.7576e-07
B	-0.5	-0.4328	1.1839e-05	1.1924e-05
C	0.07	0.0676	3.5555e-08	3.6482e-08
D	-0.05	-0.0050	1.0312e-11	1.0594e-11
E	N/A	-1.4415e-07	2.9249e-16	2.9951e-16

4. N=20:1:100, 1000 realizations

(i) Compare variance of estimator with CRLB variance





(ii) Compare mean of estimator with real value

