Probability and Statistics-Mat271 E
HOMEWORK 2
(Due: 19/4/2014)

Lecturer: Oral YAGCI

Flow discharge has been monitored on daily basis at two different "flow monitoring stations" on the streams of SIRACEVİZLER and AVSAR. These stations are closely located in the same river basin, i.e. Büyük Menderes (a conceptual definiton skecth of a hypothetical basin is given below for the simplicty). For this reason they are expose to similar hydrological conditions. In your analysis please denote the river of SIRACEVİZLER as "X" and denote the river of AVSAR as "Y".

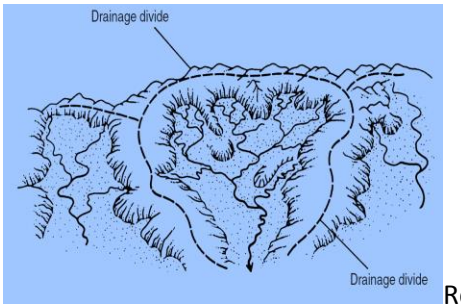
In the following tables, the measured discharge values (m^3/s) are given for a water year. Based on the values given in the tables please complete the following tasks:

a) Please obtain the **joint probability density fucntion** between these rivers.

b) Please btain the **"marginal probability density function"** both for the streams of SIRACEVİZLER and AVSAR.

c) Please explain what kind of method and algorithm did you follow during your analysis.

WHAT IS BASIN: A basin is the region that transmits its surface runoff to the same outlet.



Ref: Larry W. May (2011)

07. Büyük Menderes Havzasi

D07A123 SIRACEVİZLER D. BAHADIR

YERİ : **BANAZ İLÇESİ BAHADIR KÖYÜNÜN 1 KM MENBAĞINDA KÖPRÜDEDİR.(PAFTA K23- B4)**
29°47'16" Doğu - 38°51'19" Kuzey

YAĞIŞ ALANI : **20,81 km2** **YAKLAŞIK KOT : 1134 m**

GÖZLEM SÜRESİ : **xxxx**

ORTALAMA AKIMLAR : **Gözlem süresinde 0.260 m3/sn. (1 Yıllık) xxxx Su yılında 0.260 m3/sn.**

ANLIK EN ÇOK VE EN AZ AKIMLAR:

2008 Su yılında anlık ençok akım	**:**	**5.34 m3/sn**	**21.03.2008**
2008 Su yılında anlık enaz akım	**:**	**0.000 m3/sn**	**26.08.2008**
Gözlem süresinde anlık ençok akım	**:**	**5.34 m3/sn**	**21.03.2008**
Gözlem süresinde anlık enaz akım	**:**	**0.000 m3/sn**	**26.08.2008**

4. Anahtar Eğrisi (Seviyeler cm olarak)

Seviye	Akım	Seviye	Akım	Seviye	Akım	Seviye	Akım
50	0.000	100	1.4	160	8.4	210	17.0
52	0.000	120	3.6	170	9.7	220	19.0
54	0.000	130	4.8	180	11.2	230	21.0
60	0.006	140	6.0	190	13.0	240	23.5
80	0.175	150	7.2	200	15.0	250	26.0

Akımlar 01 Ekim 2007 'den 30 Eylül 2008' a kadar m3/sn olarak

Gün	Ekim	Kasım	Aralık	Ocak	Şubat	Mart	Nisan	Mayıs	Haziran	Temmuz	Ağustos	Eylül
01	0.006	0.160	0.648	0.158	0.358	0.230	0.692	0.268	0.051	0.013	0.007	KURU
02	0.006	0.144	0.604	0.158	0.182	0.516	0.604	0.232	0.051	0.013	0.007	KURU
03	0.006	0.144	0.472	0.158	0.098	0.516	0.604	0.196	0.051	0.013	0.007	KURU
04	0.006	0.144	0.428	0.134	0.098	0.648	0.604	0.196	0.040	0.013	0.007	KURU
05	0.006	0.144	0.904	0.134	0.098	0.692	0.692	0.196	0.040	0.013	0.007	KURU
06	0.006	0.144	1.09	0.134	0.098	0.648	2.18	0.160	0.040	0.013	0.007	KURU
07	0.006	0.144	0.842	0.110	0.098	0.692	1.73	0.160	0.040	0.009	0.007	KURU
08	0.006	0.144	0.692	0.110	0.110	0.904	1.34	0.160	0.040	0.009	0.007	KURU
09	0.006	0.144	0.648	0.110	0.110	1.09	1.15	0.160	0.040	0.009	0.007	KURU
10	0.006	0.144	1.09	0.110	0.110	0.842	1.03	0.160	0.040	0.009	0.007	KURU
11	0.006	0.144	1.44	0.110	0.110	0.648	0.966	0.160	0.040	0.009	0.004	KURU
12	0.006	0.144	1.21	0.098	0.110	0.560	1.09	0.130	0.040	0.009	0.004	0.007
13	0.006	0.428	0.880	0.098	0.098	0.472	0.966	0.115	0.040	0.009	0.004	0.007
14	0.004	1.15	0.605	0.098	0.098	0.472	0.842	0.100	0.040	0.009	0.004	0.007
15	0.003	1.09	0.518	0.098	0.098	0.428	0.780	0.145	0.040	0.009	0.004	0.007
16	0.006	0.966	0.454	0.098	0.098	0.428	0.648	0.145	0.040	0.009	0.004	0.007
17	0.020	0.842	0.422	0.098	0.098	0.472	0.516	0.145	0.040	0.009	0.004	0.009
18	0.058	0.736	0.390	0.098	0.358	0.516	0.428	0.130	0.040	0.009	0.004	0.009
19	0.078	0.648	0.326	0.098	0.390	0.560	0.384	0.115	0.040	0.009	0.004	0.009
20	0.111	0.560	0.294	0.098	0.262	0.904	0.384	0.115	0.040	0.009	0.004	0.009
21	0.111	0.428	0.294	0.098	0.098	2.91	0.384	0.100	0.040	0.009	0.004	0.009
22	0.127	0.428	0.262	0.098	0.098	2.98	0.384	0.100	0.040	0.007	0.004	0.009
23	0.111	0.428	0.262	0.098	0.098	1.99	0.340	0.085	0.017	0.007	0.004	0.013
24	0.160	0.428	0.262	0.098	0.134	1.73	0.304	0.085	0.013	0.007	0.004	0.017
25	0.216	0.384	0.230	0.098	0.134	1.21	0.268	0.085	0.013	0.007	0.004	0.017
26	0.188	0.340	0.206	0.098	0.134	0.966	0.268	0.100	0.013	0.007	KURU	0.017
27	0.160	0.472	0.206	0.098	0.134	0.842	0.268	0.074	0.013	0.007	KURU	0.017
28	0.160	1.47	0.182	0.098	0.134	0.966	0.268	0.074	0.013	0.007	KURU	0.017
29	0.160	0.780	0.182	0.110	0.182	0.966	0.268	0.063	0.013	0.007	KURU	0.021
30	0.160	0.648	0.182	0.230	-----	0.842	0.268	0.051	0.013	0.007	KURU	0.063
31	0.160	-----	0.158	0.358	-----	0.736	-----	0.051	-----	0.007	KURU	-----
Maks.	1.28	2.91	2.17	0.486	0.422	5.34	3.19	0.428	0.063	0.017	0.013	0.100
Min.	0.001	0.144	0.158	0.098	0.060	0.230	0.268	0.040	0.013	0.003	KURU	KURU
Ortalama	0.067	0.466	0.528	0.122	0.146	0.915	0.688	0.131	0.034	0.009	0.004	0.009
LT/SN/Km2	3.21	22.4	25.4	5.87	7.00	44.0	33.1	6.29	1.64	0.439	0.202	0.434
AKIM mm.	8.60	58.0	68.0	15.7	17.5	118.	85.7	16.8	4.24	1.17	0.540	1.13
MİL. M3	0.179	1.21	1.42	0.327	0.365	2.45	1.78	0.350	0.088	0.024	0.011	0.023

SU YILI (2008) YILLIK TOPLAM AKIM 8.23 MİLYON M3 395 MM. 12.5 LT/SN/Km2

07. Büyük Menderes Havzasi

D07A124 AVŞAR ÇAYI HAYDARLI

YERİ : **ISPARTA-DİNAR-HAYDARLI DEVLET YOLUNU TAKİBEN HAYDARLI KASABASINA VARILIR. KAŞABANIN KUZEY BATISINDA BULUNAN AVŞAR ÇAYINI TAKİBEN, TAKRİBEN 7 KM SONRA DERENİN SAĞ SAHİLİNDEDİR. 30°23'7" Doğu - 38°18'36" Kuzey**

YAĞIŞ ALANI : **18,00 km2** **YAKLAŞIK KOT : 1316 m**

GÖZLEM SÜRESİ : **xxxx**

ORTALAMA AKIMLAR : **Gözlem süresinde 0.097 m3/sn. (3 Yıllık) xxxx Su yılında 0.117 m3/sn.**

ANLIK EN ÇOK VE EN AZ AKIMLAR:

2008 Su yılında anlık encok akım	**:**	**0.642 m3/sn**	**09.03.2008**
2008 Su yılında anlık enaz akım	**:**	**0.000 m3/sn**	**09.10.2007**
Gözlem süresinde anlık encok akım	**:**	**1.01 m3/sn**	**08.04.2004**
Gözlem süresinde anlık enaz akım	**:**	**0.000 m3/sn**	**11.10.2006**

4. Anahtar Eğrisi (Seviyeler cm olarak)

Seviye	Akım	Seviye	Akım	Seviye	Akım	Seviye	Akım
1	0.000	12	0.015	17	0.100	30	0.459
8	0.001	13	0.028	18	0.123	40	0.764
9	0.002	14	0.046	19	0.145	50	1.1
10	0.004	15	0.063	20	0.171		
11	0.008	16	0.080	25	0.307		

Akımlar 01 Ekim 2007 'den 30 Eylül 2008' a kadar m3/sn olarak

Gün	Ekim	Kasım	Aralık	Ocak	Şubat	Mart	Nisan	Mayıs	Haziran	Temmuz	Ağustos	Eylül
01	0.015	0.123	0.123	0.123	0.046	0.145	0.551	0.123	0.008	KURU	KURU	KURU
02	0.015	0.123	0.100	0.123	0.046	0.145	0.551	0.123	0.008	KURU	KURU	KURU
03	0.015	0.123	0.063	0.080	0.046	0.198	0.551	0.123	0.008	KURU	KURU	KURU
04	0.015	0.123	0.046	0.046	0.046	0.225	0.520	0.123	0.008	KURU	KURU	KURU
05	0.015	0.123	0.253	0.046	0.080	0.225	0.520	0.123	0.008	KURU	KURU	KURU
06	0.015	0.368	0.280	0.046	0.123	0.171	0.520	0.123	0.008	KURU	KURU	KURU
07	0.015	0.307	0.253	0.015	0.145	0.198	0.520	0.080	0.008	KURU	KURU	KURU
08	0.015	0.280	0.253	0.015	0.145	0.398	0.520	0.080	0.008	KURU	KURU	KURU
09	0.015	0.253	0.307	0.015	0.145	0.642	0.520	0.080	0.008	KURU	KURU	KURU
10	0.015	0.253	0.368	0.046	0.145	0.429	0.520	0.046	0.008	KURU	KURU	KURU
11	0.015	0.253	0.123	0.028	0.145	0.280	0.459	0.046	0.008	KURU	KURU	KURU
12	0.015	0.123	0.198	0.028	0.123	0.253	0.459	0.046	0.008	KURU	KURU	KURU
13	0.015	0.198	0.253	0.028	0.123	0.225	0.459	0.046	0.015	KURU	KURU	KURU
14	0.080	0.225	0.253	0.046	0.123	0.225	0.459	0.015	0.015	KURU	KURU	KURU
15	0.080	0.198	0.198	0.046	0.123	0.225	0.398	0.015	0.015	KURU	KURU	KURU
16	0.080	0.171	0.198	0.046	0.123	0.225	0.398	0.015	0.015	KURU	KURU	KURU
17	0.080	0.145	0.198	0.046	0.123	0.225	0.398	0.015	0.015	KURU	KURU	KURU
18	0.080	0.123	0.198	0.046	0.145	0.225	0.398	0.015	0.015	KURU	KURU	KURU
19	0.080	0.123	0.198	0.046	0.145	0.253	0.398	0.015	0.015	KURU	KURU	KURU
20	0.080	0.123	0.198	0.046	0.080	0.307	0.398	0.015	0.015	KURU	KURU	KURU
21	0.080	0.225	0.145	0.046	0.046	0.368	0.398	0.015	0.015	KURU	KURU	KURU
22	0.080	0.100	0.145	0.046	0.046	0.612	0.398	0.015	0.015	KURU	KURU	KURU
23	0.080	0.063	0.145	0.046	0.080	0.612	0.398	0.015	0.015	KURU	KURU	0.002
24	0.123	0.046	0.145	0.046	0.080	0.612	0.337	0.015	0.008	KURU	KURU	0.002
25	0.123	0.046	0.145	0.046	0.171	0.551	0.337	0.015	0.008	KURU	KURU	0.002
26	0.123	0.028	0.145	0.046	0.145	0.551	0.307	0.015	0.004	KURU	KURU	0.015
27	0.123	0.028	0.145	0.046	0.198	0.551	0.307	0.015	KURU	KURU	KURU	0.046
28	0.123	0.145	0.145	0.046	0.145	0.551	0.280	0.015	KURU	KURU	KURU	0.028
29	0.123	0.080	0.123	0.046	0.123	0.551	0.225	0.015	KURU	KURU	KURU	0.015
30	0.123	0.063	0.123	0.046	-----	0.551	0.171	0.015	KURU	KURU	KURU	0.015
31	0.123	-----	0.123	0.046	-----	0.551	-----	0.015	-----	KURU	KURU	-----
Maks.	0.123	0.368	0.368	0.123	0.198	0.642	0.551	0.123	0.015	KURU	KURU	0.046
Min.	KURU	KURU	0.046	KURU	KURU	KURU	KURU	KURU	KURU	KURU	KURU	KURU
Ortalama	0.064	0.153	0.180	0.047	0.112	0.364	0.422	0.046	0.009	KURU	KURU	0.004
LT/SN/Km2	3.55	8.49	10.0	2.63	6.23	20.2	23.5	2.57	0.520	0.000	0.000	0.231
AKIM mm.	9.50	22.0	26.8	7.04	15.6	54.1	60.8	6.87	1.35	0.000	0.000	0.600
MİL. M3	0.171	0.396	0.483	0.127	0.281	0.975	1.10	0.124	0.024	0.000	0.000	0.011

SU YILI (2008) YILLIK TOPLAM AKIM 3.69 MİLYON M3 205 MM. 6.5 LT/SN/Km2