

Probability and Statistics-Mat271 E

HOMEWORK 3

Instructor: Assoc. Prof. Oral YAĞCI

For a construction of a dam, it is necessary to describe the precipitation character in a reservoir. For the duration of 58 years (1931-1988) the precipitation values were recorded at a gauging station. Annual maximum hourly precipitation depth values observed at a gauging station as are given in table below.

1. Plot the data on the Gumbel probability paper to check whether the data fits to Gumbel Distribution.
2. Find the probability of the occurrence any year of a precipitation higher than 90 mm. What is the returning period of this precipitation?
3. Calculate the precipitation values for the returning period of 25, 50, 75, and 100 years.

**TABLE 1. ANNUAL MAXIMUM HOURLY PRECIPITATION DEPTH IN MILLIMETERS
AT A GAUGING STATION**

Year	X (mm)	Year	X (mm)	Year	X (mm)	Year	X (mm)	Year	X (mm)	Year	X (mm)
1931	38.6	1941	40.2	1951	76.2	1961	66.5	1971	50.4	1981	89.4
1932	33.7	1942	53.8	1952	27.41	1962	24.53	1972	43.2	1982	27.23
1933	33.8	1943	26,9	1953	69.4	1963	64.1	1973	39.6	1983	32.7
1934	79.2	1944	34.7	1954	22.81	1964	53.9	1974	38.7	1984	105.7
1935	58.6	1945	72.6	1955	34.8	1965	66.5	1975	40.2	1985	25.38
1936	39.3	1946	30.2	1956	38.8	1966	32.9	1976	55.7	1986	27.22
1937	33.2	1947	42.7	1957	39.8	1967	52.4	1977	118.9	1987	128.5
1938	29.2	1948	54.5	1958	29.33	1968	27.84	1978	25.0	1988	24.73
1939	46.7	1949	30.0	1959	58.1	1969	23.33	1979	55.6		
1940	80.0	1950	30.0	1960	48.5	1970	80.0	1980	40.1		

Reminder: Homework should be written in computer environment (please use Word, Latex etc.). The procedure should be explained rigorously, and the results should be presented clearly.