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FREQUENCIES OF DAILY EXTREMES IN TEMPERATURE AT ROSEBURG, OREGON

Question: "During a given 10-day period at Roseburg, what is the likelihood the maximum temperature observed during the day will be a certain value?"

Table 1: As an example of how to read Table 1, which presents data on daily maximum temperatures, look at the top row of numbers for the period 1-10 January. Values tabulated are based on actual observations made at Roseburg during the years 1948-58, and are presented on the basis of "days in 100 days". That is, during the first third of January, daily maximum temperatures from 30 F to 39 F occurred at the rate of 13 days in 100 days. During the same period, daily maximum temperatures from 40 F to 49 F occurred at the rate of 53 days in 100 days. Combining these two statements, one may compute that during the first third of January daily maximum temperatures from 30 F to 49 F occurred at the rate of 13+53, which is 66 days in 100 days, or 66 per cent of the days. Similar combinations of data may be made with respect to other maximum temperatures and other periods of the year.

Question: "During a given 10-day period at Roseburg, what is the likelihood the minimum temperature observed during the day will be below a certain value?"

Table 2: Table 2 is similar to Table 1, except it presents data on daily minimum temperatures. As an example of how to read this Table, look again at the row of values for the first third of January. Suppose we are interested, in the question above, in minima below 30 F. For this period, we may compute the answer by adding all the numbers to the left of the column headed "30-39 F"; that is, 3+18; that is, 21 days in 100 days, or 21 per cent of the time. The likelihood that minimum temperature will be above 29 F during this period, therefore, is 100 - 21, which is 79 per cent, or about 8 chances in 10.

If we had been interested in minima below 20 F in the question above, the answer would have been the sum of the numbers lying to the left of the column headed "20-29 F"; that is, 3 days in 100 days, or 3 per cent of the time. The likelihood of minima above 19 F, therefore, would be 100 - 3, or 97 per cent. As with maximum temperatures, similar combinations of data for other temperatures and other periods of the year may be made to answer other specific questions.

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Table 1. Frequency of Daily Maximum Temperatures at Roseburg, Oregon, as Days in 100 Days.

Period		Temperature, degrees F								
		20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	99 +
	1 - 10		13	53	30	4				
Jan.	11 - 20		17	51	26	5				
	21 - 31	2	17	39	35	7				
	1 - 10		5	32	45	17	1			
Feb.	11 - 20		5	34	48	12	1			
	21 - 29			36	39	24	1			
	1 - 10		2	29	47	21	1			
Mar.	11 - 20			23	57	17	3			
	21 - 31			6	60	29	5			
	1 - 10			4	40	32	20	4		
Apr.	11 - 20			3	25	46	17	8	1	
	21 - 30			2	38	40	17	2	1	
	1 - 10				23	40	31	5	1	
May	11 - 20				15	30	33	18	4	
	21 - 31				9	38	35	18		
	1 - 10				7	31	36	21	5	
June	11 - 20				4	27	42	24	3	
	21 - 30				1	26	40	24	9	
	1 - 10					9	33	44	13	1
July	11 - 20					4	24	54	15	3
	21 - 31					2	26	46	25	1
	1 - 10					2	28	56	12	2
Aug.	11 - 20					2	31	45	21	1
	21 - 31					11	32	44	13	
	1 - 10					10	27	37	23	3
Sept.	11 - 20					19	37	31	13	
	21 - 30				2	29	40	24	5	
	1 - 10				15	31	38	14	2	
Oct.	11 - 20				23	53	21	3		
	21 - 31			6	43	44	7			
	1 - 10			7	42	47	4			
Nov.	11 - 20		5	24	53	15	3			
	21 - 30	2	11	20	46	20	1			
	1 - 10		5	42	50	3				
Dec.	11 - 20		12	40	40	8				
	21 - 31		11	52	35	2				

Table 2. Frequency of Daily Minimum Temperatures at Roseburg, Oregon, as Days in 100 Days.

Period	Temperature, degrees F						
	0-9	10-19	20-29	30-39	40-49	50-59	60-69
1 - 10		3	18	62	17		
Jan. 11 - 20		3	19	64	13	1	
21 - 31	2	7	22	48	21		
1 - 10		4	17	52	27		
Feb. 11 - 20		2	15	57	25	1	
21 - 29			9	68	20	3	
1 - 10		1	22	52	22	3	
Mar. 11 - 20			16	60	24		
21 - 31			5	55	40		
1 - 10			5	60	32	3	
Apr. 11 - 20			1	35	62	2	
21 - 30			4	52	41	3	
1 - 10			1	31	57	11	
May 11 - 20				14	70	16	
21 - 31				12	61	27	
1 - 10				6	53	39	2
June 11 - 20				5	45	46	4
21 - 30				2	38	57	3
1 - 10					34	64	2
July 11 - 20					20	73	7
21 - 31					28	67	5
1 - 10					28	67	5
Aug. 11 - 20					27	70	3
21 - 31					35	61	4
1 - 10					38	56	6
Sept. 11 - 20				4	51	44	1
21 - 30				18	51	31	
1 - 10				19	58	23	
Oct. 11 - 20			2	23	52	23	
21 - 31			4	40	43	13	
1 - 10			7	33	55	5	
Nov. 11 - 20		3	4	48	44	1	
21 - 30		17	38	33	12		
1 - 10			9	61	28	2	
Dec. 11 - 20			10	53	35	2	
21 - 31			24	58	17	1	

Table 3. Occurrence of Extremes in High and Low Temperatures at Roseburg.

Frequency	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Days with maximum temperatures 90 F or above												
Most in a year	0	0	0	1	2	5	14	17	9	2	0	0
Mean	0	0	0	0	0	2	7	5	4	0	0	0
Fewest in a year	0	0	0	0	0	0	0	0	0	0	0	0
Days with minimum temperatures 32 F or below												
Most in a year	28	16	19	8	2	0	0	0	1	8	17	19
Mean	14	10	9	4	0	0	0	0	0	2	7	10
Fewest in a year	3	1	0	1	0	0	0	0	0	0	0	0

Question: "In a given month at Roseburg, what is the greatest frequency of high daily temperature maxima observed, and how does it compare with the average frequency?"

Table 3: To give the reader an idea of the variability of temperature extremes in a given period from one year to another, data on the range of frequencies of high and low temperatures together with average frequencies are presented in Table 3. This Table is developed from the same observations as the other Tables of this Note, but presents them differently. Interpretation of data such as in Table 3 is considered in some detail on page 15 of Note 22, "Putting Weather Records to Work."

The data: One must keep in mind that the observations of temperature summarized in these Tables were made about five feet above a grassy plot in the official U.S. Weather Bureau instrument shelter at Roseburg Airport. Not only will temperatures vary from place to place at a given time, but also they will be different nearer the earth's surface or farther from it than in the official shelter. In short, values presented here cannot be considered more than a suggestion of the patterns in time and space of temperature occurring on a given day.

Even with these various restrictions on interpreting the data, they will give the reader a rough idea of the levels of temperature extreme likely at different times of the year in the Roseburg area.

For detailed information on dates of last freeze in the spring and first freeze in the fall at various locations in Oregon, the reader may wish to refer to a publication soon to be made available by the Oregon Agricultural Experiment Station, Corvallis.

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