

ST516

Module 8

Homework 8

1. Answered in Homework8.R
2. Answered in Homework8.R
3. Sleep length between 20- and 40-somethings

Twenties	4 6 5 9 8 9 3 5 7
Forties	9 5 8 8 7 9 8 8 9 6 4

- a. Rank-sum statistic by hand

group	observe	rank	adj rank
T	3	1	1
T	4	2	2.5
T	5	4	5
T	5	5	5
T	6	7	7.5
T	7	9	9.5
T	8	11	13
T	9	16	18
T	9	17	18
F	4	3	2.5
F	5	6	5
F	6	8	7.5
F	7	10	9.5
F	8	12	13
F	8	13	13
F	8	14	13
F	8	15	13
F	9	18	18
F	9	19	18
F	9	20	18

- b. For the case in which there are a large number of ties with respect to the sample size, such as above, the normal approximation of the reference distribution for the T statistic (here the sum of ranks in the “Twenties” group) will not be very good.
4. Length of sinus inflammation

Length of time in days of inflammation
7 14 21 20 19 30 22 18

observe	diff	abs(diff)	rank	group
7	-14	14	8	N
14	-7	7	6	N
21	0	0	1	P
20	-1	1	2.5	N
19	-2	2	4	N
30	9	9	7	P
22	1	1	2.5	P
18	-3	3	5	N

T	T(+)	10.5
	T(-)	25.5

5. Answered in Homework8.R