

SPINOFF 9B

Standard Deviations of Time Spent in the OPFs

Following is a list of flight numbers corresponding to the Orbiter Discovery's missions. That is, Discovery was used for the the 12th,14th, 15th etc. missions. Other Orbiters (Columbia, Challenger, Atlantis, and Endeavour) also flew missions.

Discovery: 12, 14, 15, 16, 18, 20, 26, 28, 32, 35, 36, 40, 43, 45, 52, 54, 57, 60, 64, 67, 70

Use this information in conjunction with data in Table 9B (located at the end of this Spinoff) to do the following exercises. The information can be found in Space Shuttle: The History of Developing the National Space Transportation System by Dennis R. Jenkins.

Different missions have different payloads, planned sets of experiments, and flight plans. Some missions were set up to shuttle people and supplies to the MIR Space Station. Some were used to retrieve and repair satellites. The main purpose of other missions was to conduct lab experiments in space. Some short trips required a long period of time to pack new lab experiments for the trip.

In the VAB, the solid rocket boosters and the Orbiter are mated and attached to the mobile launch pad. The type of mission flown does not impact the time needed in the VAB as much as it does the time needed in the OPF. With this short explanation to guide you, answer the following questions.

- 1) Which standard deviation would you expect to be larger, the standard deviation for the times that Discovery spent in the VAB or the times spent in the OPF? Why?
- 2) Compute the mean and standard deviation of the times that Discovery spent in the OPF.
- 3) Compute the mean and standard deviation of the times that Discovery spent in the VAB.
- 4) Construct histograms for the times that Discovery spent in the OPF and in the VAB. Set the OPF window for the x-axis to be 0.5 to 300.5 and and the y-axis to be 0 to 11. Set the class width (x-scale) to 50. Set the VAB window for the x-axis to be 0.5 to 48.5 and the y-axis to be 0 to 11. Set the class width (x-scale) to 8.
- 5) Looking at the histograms for the times that Discovery spent in the OPF and in the VAB, which set of data would you expect to have larger mean? Why?
- 6) Looking at the histograms for the times that Discovery spent in the OPF and in the VAB, which set of data would you expect to have the larger standard deviation? Why?

Table 9B

Flight #	Time Spent in OPF (days)	Time Spent in VAB (days)	Flight #	Time Spent in OPF (days)	Time Spent in VAB (days)	Flight #	Time Spent in OPF (days)	Time Spent in VAB (days)
1	613	37	26	263	32	51	73	5
2	103	21	27	243	11	52	251	13
3	68	13	28	100	16	53	63	10
4	41	8	29	87	11	54	74	12
5	55	12	30	162	12	55	93	5
6	139	8	31	97	8	56	63	36
7	34	5	32	86	22	57	61	8
8	27	6	33	88	12	58	89	36
9	98	10	34	83	10	59	111	7
10	117	6	35	90	11	60	105	5
11	32	4	36	111	9	61	86	7
12	147	47	37	147	19	62	91	5
13	143	5	38	127	61	63	82	6
14	38	5	39	108	7	64	166	8
15	36	15	40	163	6	65	79	26
16	55	5	41	428	5	66	126	6
17	147	10	42	61	6	67	99	5
18	40	8	43	80	11	68	108	5
19	45	6	44	68	5	69	148	6
20	31	7	45	76	6	70	80	8
21	78	18	46	76	7	71	92	8
22	62	4	47	221	5	72	121	7
23	27	4	48	109	5	73	86	9
24	109	12	49	63	9	74	103	7
25	36	5	50	78	8	75	89	8