Computer Assignment 4

Based on a report published in 1979 by the Navy Manpower and Material Analysis Center, the demand for labor by thirteen U.S. Naval Hospitals according to occupancy rates of hospital beds is given below.

Hospital	1	2	3	4	5	6	7
Required Man-hours per Month	566.52	696.82	1033.15	1603.62	1611.37	1613.27	1854.17
Bed-days per Month	472.92	1339.75	620.25	568.33	1497.60	1365.83	1687.00
Hospital	8	9	10	11	12	13	
Required Man-hours per Month	2160.55	2305.58	3503.93	3571.89	3741.40	4026.52	
Bed-days per Month	1639.92	2872.33	3655.08	2912.00	3921.00	3865.67	

(A man-hour is a unit describing the number of people and the number of hours spent in their labor. A bed-day is a unit describing the number of beds and the amount of time that they are occupied.)

1. Plot the required number of man-hours versus bed-days per month. Let x be the number of bed-days and let y be the number of man-hours.
2. Assert that a linear relation exits between the required man-hours and bed-days. Write the linear model that describes your assertion. Be sure to state the probability distribution which you are assuming for ϵ.
3. Compute the least squares estimates of β_0 and β_1.
4. Find the 95% confidence intervals for β_0 and β_1 that are associated with the linear model.
5. Compute the 95% confidence interval of the estimate for the predicted mean, $\widehat{E[y]}$, when $x_0 = 2500$.
6. Compute the 95% confidence interval of the estimate for the predicted man-hours required by a particular hospital, $\widehat{y}$, when $x_0 = 3000$.
7. Test the hypothesis $H_0 : \beta_1 = 0$ vs $H_1 : \beta_1 \neq 0$ at a level of significance of $\alpha = .05$.
8. Make a plot of residuals versus predicted values.
9. Is the model a good model? Explain your answer.