1. The following information was obtained from a sample data set.

X	10	8	11	6	10	11	6	12	15
Y	103	85	130	75	98	112	65	140	155

(i) Write the normal equations
(ii) Determine the least squares regression line
(iii) Test whether there is linear regression. Between Y and X. Use $\alpha = 0.05$
(iv) Calculate the correlation coefficient

2. Using the following data construct a 99% confidence interval of $\mu_1 - \mu_2$. Assume that the samples are independent.

$n_1 = 45, \vec{x}_1 = 35.6,\ s_1 = 4.2, n_2 = 32, \vec{x}_2 = 40.8,\ s_2 = 5.8$ Take $\alpha =$ 0.05

3. Two independent samples from two normal distributions gave the following information:

$$n_1 = 15, \vec{x}_1 = 24.1, s_1 = 3.6, n_2 = 10, \vec{x}_2 = 15.4,\ s_2 = 4.1$$

Test the hypothesis

$H_0 = \mu_1 = \mu_2$, $H_a = \mu_1 \neq \mu_2$. Take α=0.05.

4. A researcher wants to find the effect of a special diet on systolic blood. She selected a sample of 7 adults and put them on this dietary plan for three months. The following table gives the systolic blood pressures of these seven adults before and after the completion of this plan. Consider this is a paired sample experiment.

Blood Pressure

Before	210	182	195	227	224	190	234
After	197	186	186	223	220	183	233

(i) construct a 99% confidence interval for μ_D.
(ii) Test the hypothesis $H_0 = \mu_D = 0, H_a = \mu_D \neq 0$. Take $\alpha = 0.01$.

5. Use the data of problem #1 to construct a 99% prediction interval of Y when X- 25.