2. a As QUET increases SBP increases. As Age increases QUET increases. As Age increases SBP increases.

b **(1)** $\hat{\beta}_0 = 70.576$ $\hat{\beta}_1 = 21.492$

(2) $\hat{Y} = 70.576 + 21.492X$. The line is plotted on the graph below.

(3) $H_0: \beta_1 = 0$ $H_A: \beta_1 \neq 0$

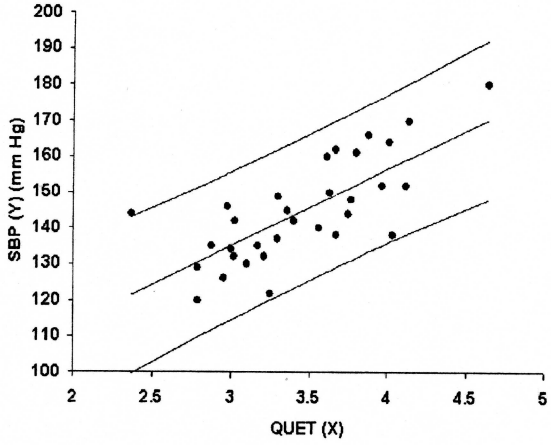
Test statistic: $T = 6.06$ P-value: $P < 0.0001$

Critical value: $t_{30,1-\alpha/2} = 2.042$ under H_0 at $\alpha = 0.05$.

Since $|T| > 2.042$ we reject H_0 and conclude that the slope is not equal to 0. Alternatively we can use the P-value from the SAS output. Since the P-value is < 0.05, we reject H_0 and conclude the slope is not equal to 0. There is a significant linear relationship between QUET and SBP.

(4) Yes.

(5)

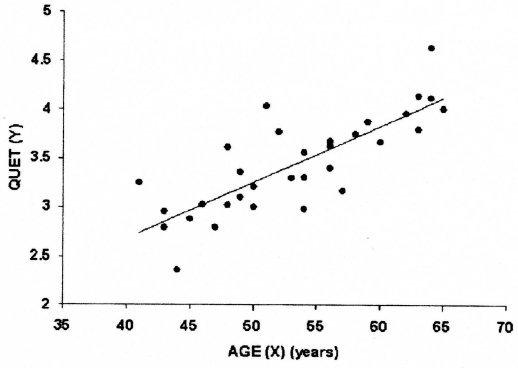


(6) From the data we see that person 20 has a QUET $\cong 3.4$. Using the SAS output for observation 20 we find the 95% prediction interval equals (123.3, 164.0). We are 95% confident that the true systolic blood pressure for an individual with QUET $= 3.4$ is between 123.3 and 164.

(7) No.

c **(1)** $\hat{\beta}_0 = 0.386$ $\hat{\beta}_1 = 0.057$

(2) $\hat{Y} = 0.386 + 0.057X$



(3) $H_0: \beta_1 = 0$ $H_A: \beta_1 \neq 0$

$T = 7.37$ $P < 0.0001$

Since the P-value is < 0.05 we reject H_0 and conclude that the slope is not equal to 0. There is a significant linear relationship between Age and QUET.

(4) Yes.