The purity of oxygen produced by a fractional distillation process is thought to be related to the percentage of hydrocarbons in the main condensor of the processing unit. Twenty samples are shown below.

**a.** Fit a simple linear regression model to the data.

**b.** Test the hypothesis H0: $\beta 1 = 0$.

**c.** Calculate R2.

**d.** Find a 95% CI on the slope.

**e.** Find a 95% CI on the mean purity when the hydrocarbon percentage is 1.00.

| Purily (%) | Hydrocarbon (%) | Purily (%) | Hydrocarbon (%) |
|---|---|---|---|
| 86.91 | 1.02 | 96.73 | 1.46 |
| 89.85 | 1.11 | 99.42 | 1.55 |
| 90.28 | 1.43 | 98.66 | 1.55 |
| 86.34 | 1.11 | 96.07 | 1.55 |
| 92.58 | 1.01 | 93.65 | 1.40 |
| 87.33 | 0.95 | 87.31 | 1.15 |
| 86.29 | 1.11 | 95.00 | 1.01 |
| 91.86 | 0.87 | 96.85 | 0.99 |
| 95.61 | 1.43 | 85.20 | 0.95 |
| 89.86 | 1.02 | 90.56 | 0.98 |