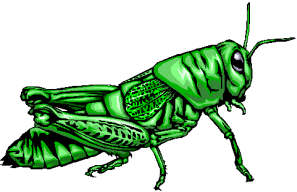
For Linear regression model with one variable – Lab assignment.

  
Pierce (1948) mechanicallymeasured the frequency (the number of wing vibrations per second) of chirps (or pulses of sound) made by a striped ground cricket, at various ground temperatures.  Since crickets are ectotherms (cold-blooded), the rate of their physiological processes and their overall metabolism are influenced by temperature.  Consequently, there is reason to believe that temperature would have a profound effect on aspects of their behavior, such as chirp frequency.  
In general, it was found that crickets did not sing at temperatures colder than 60º F. or warmer than 100º F.

|  |  |
| --- | --- |
| Chirps/Second | Temperature (º F) |
| **20.0** | **88.6** |
| **16.0** | **71.6** |
| **19.8** | **93.3** |
| **18.4** | **84.3** |
| **17.1** | **80.6** |
| **15.5** | **75.2** |
| **14.7** | **69.7** |
| **15.7** | **71.6** |
| **15.4** | **69.4** |
| **16.3** | **83.3** |
| **15.0** | **79.6** |
| **17.2** | **82.6** |
| **16.0** | **80.6** |
| **17.0** | **83.5** |
| **14.4** | **76.3** |

|  |  |  |
| --- | --- | --- |
| **Task:** | a.) | Determine a linear regression model equation to represent this data. |
|  | b.) | Graph the new equation. |
|  | c.) | Decide whether the new equation is a "good fit" to represent this data. |
|  | d.) | Extrapolate data:  If the ground temperature reached 95º, then at what approximate rate would you expect the crickets to be chirping? |
|  | e.) | Interpolate data:  With a listening device, you discovered that on a particular morning the crickets were chirping at a rate of 18 chirps per second.  What was the approximate ground temperature that morning? |
|  | f.) | If the ground temperature should drop to freezing (32º F), what happens to the cricket's chirping rate? |