Homework 5

1. (1 points) Load the Car Road Tests dataset (`data("mtcars")`, `?mtcars`), then create a new column for `mtcars` named as `mpg_2`. This new column will categorize "mpg" into four categories using the thresholds below:

`mpg_2` category	Thresholds
Low	mpg $<$ 16
Low_intermediate	16 $\leq$ mpg $<$ 21
Intermediate_high	21 $\leq$ mpg $<$ 26
High	26 $\leq$ mpg

2. (1 points) Make a boxplot to show the `mpg` values for each level of `mpg_2`. Add horizontal dashed lines to depict the thresholds in question 1.

3. (3 points) Make a scatter plot to show the raw `mpg` values and use `mpg_2` to color points. (Hint: `?plot` and you will find that `y` argument is *optional*.) Again add horizontal dashed lines to depict the thresholds in question 1.

4. (1 points) Load the Earthquakes dataset (`data(quakes)`, `?quakes`), then create a new column called `depth_2`. This new column will categorize `depth` into 3 categories using the thresholds below:

`depth_2` category	Thresholds
1	depth $<$ 150
2	150 $\leq$ depth $<$ 500
3	500 $\leq$ depth

5. (1 points) Create a new column called `mag_2`.
   - If the `mag` value is $<$ 4.5, assign `mag_2` to "green";
   - If the `mag` value is $>=$ 4.5 but $<$ 5.0, assign `mag_2` to "blue";
   - If the `mag` value is $>=$ 5.0, assign `mag_2` to "red".

6. (3 points) Plot the earthquakes, with longitude in the x-axis and latitude in the y-axis. Use `pch = 16` for *shape* of points; use the `depth_2` variable to define the *size* of the points; and use the `mag_2` variable to define the *color* of the points. Does the magnitude of earthquakes appear to be larger for deeper ones?