## EXERCISE 1

Re-create this same plot from scratch without saving anything to a variable. That is, start from the ggplot call.

- Start with the ggplot() function.
- Use the gm data.
- Map gdpPercap to the x-axis and lifeExp to the y-axis.
- Add points to the plot
- Make the points size 4
- Map continent onto the aesthetics of the point
- Use a log10 scale for the x-axis.

## **EXERCISE 2**

- 1. Make a scatter plot of lifeExp on the y-axis against year on the x.
- 2. Make a series of small multiples faceting on continent.
- 3. Add a fitted curve, smooth or lm, with and without facets.
- 4. **Bonus**: using <code>geom\_line()</code> and and aesthetic mapping <code>country</code> to <code>group=</code>, make a "spaghetti plot", showing <code>semitransparent</code> lines connected for each country, faceted by continent. Add a smoothed loess curve with a thick (lwd=3) line with no standard error stripe. Reduce the opacity (alpha=) of the individual black lines.

## **EXERCISE 3**

- 1. Make a jittered strip plot of GDP per capita against continent.
- 2. Make a box plot of GDP per capita against continent.
- 3. Using a log10 y-axis scale, overlay semitransparent jittered points on top of box plots, where outlying points are colored.
- 4. **BONUS**: Try to reorder the continents on the x-axis by GDP per capita. Why isn't this working as expected? See **?reorder** for clues.

## **EXERCISE 4**

- 1. Plot a histogram of GDP Per Capita.
- 2. Do the same but use a log10 x-axis.
- 3. Still on the log10 x-axis scale, try a density plot mapping continent to the fill of each density distribution, and reduce the opacity.
- 4. Still on the log10 x-axis scale, make a histogram faceted by continent and filled by continent. Facet with a single column (see ?facet\_wrap for help). Save this to a 6x10 PDF file.