STA 326 2.0 Programming and Data Analysis with R

Functionals

Question:

Use the gapminder dataset.

```
library(gapminder)
data(gapminder)
head(gapminder)
```

```
# A tibble: 6 x 6
  country     continent  year lifeExp      pop gdpPercap
  <fct>       <fct>     <int>   <dbl>    <int>     <dbl>
1 Afghanistan Asia       1952    28.8  8425333      779.
2 Afghanistan Asia       1957    30.3  9240934      821.
3 Afghanistan Asia       1962    32.0 10267083      853.
4 Afghanistan Asia       1967    34.0 11537966      836.
5 Afghanistan Asia       1972    36.1 13079460      740.
6 Afghanistan Asia       1977    38.4 14880372      786.
```

```
library(ggplot2)
ggplot(gapminder, aes(x=year, y=lifeExp, group=country)) +
    geom_line(alpha=0.5)
```
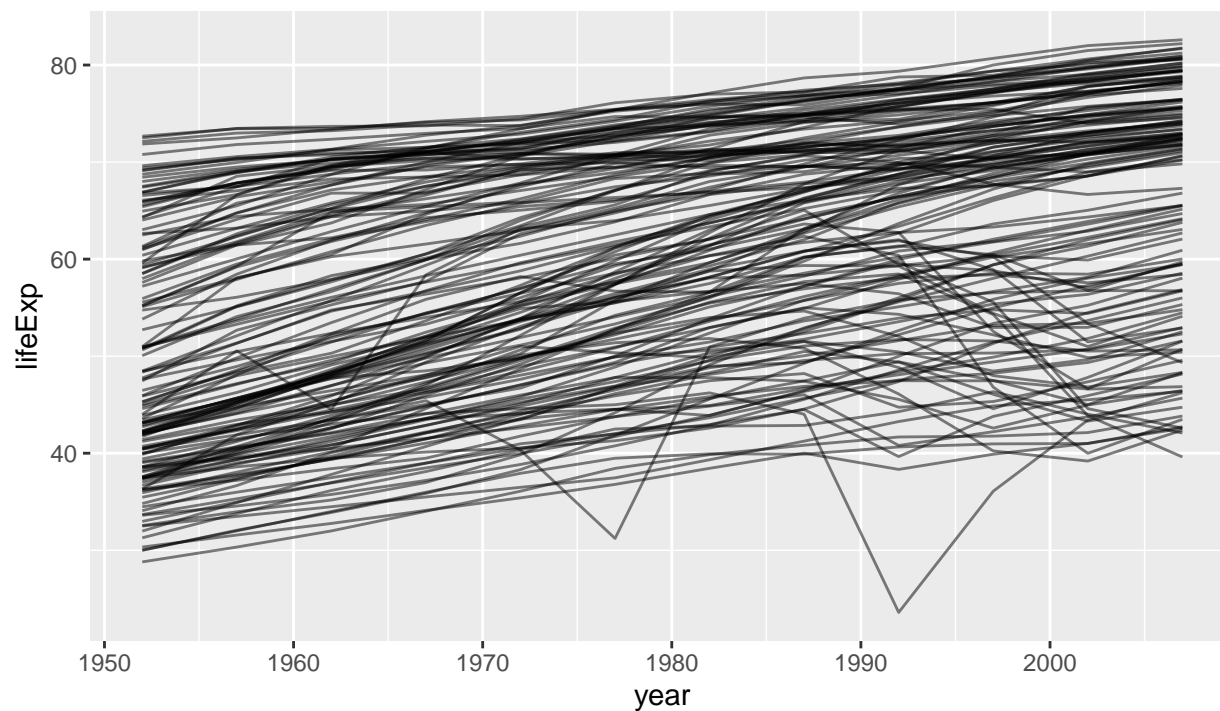

Write an R code to estimate β_0 and β_1 of $lifeExp = \beta_0 + \beta_1 year$ using least squares approach for each country.

Plot the distribution of $\hat{\beta}_1$ values. Interpret the results.