data-science_R_summary

March 24, 2018

1 python versus R

1.1 simple data analysis, wrangling, and plotting

Below is R summary More details may be found at ... python equivalent in data-science_R_summary notebook in same folder

```
In [38]: gapminder_data <- read.csv("https://raw.githubusercontent.com/berndtlindner/R_and_pyth
         head(gapminder_data)
```

X	country	continent	year	lifeExp	pop	gdpPercap
1	Afghanistan	Asia	1952	28.801	8425333	779.4453
2	Afghanistan	Asia	1957	30.332	9240934	820.8530
3	Afghanistan	Asia	1962	31.997	10267083	853.1007
4	Afghanistan	Asia	1967	34.020	11537966	836.1971
5	Afghanistan	Asia	1972	36.088	13079460	739.9811
6	Afghanistan	Asia	1977	38.438	14880372	786.1134

```
In [39]: continent_color <- data.frame(continent=c("Asia", "Europe","Africa", "Americas", "Ocea
                                        color=c("red", "blue", "green", "purple", "pink"))
```

```
In [40]: library(dplyr)
         data <-  gapminder_data  %>%
         group_by(continent, year)  %>%
         summarise(lifeExp_mean = mean(lifeExp))  %>%
         left_join(continent_color, by = "continent")    #left_join on colors for the continen
         data  %>% head()
```

continent	year	lifeExp_mean	color
Africa	1952	39.13550	green
Africa	1957	41.26635	green
Africa	1962	43.31944	green
Africa	1967	45.33454	green
Africa	1972	47.45094	green
Africa	1977	49.58042	green

```
In [41]: lm(data$year ~ data$lifeExp_mean) #Fitting Linear Models [lm(y ~ x1+x2+....)]
```

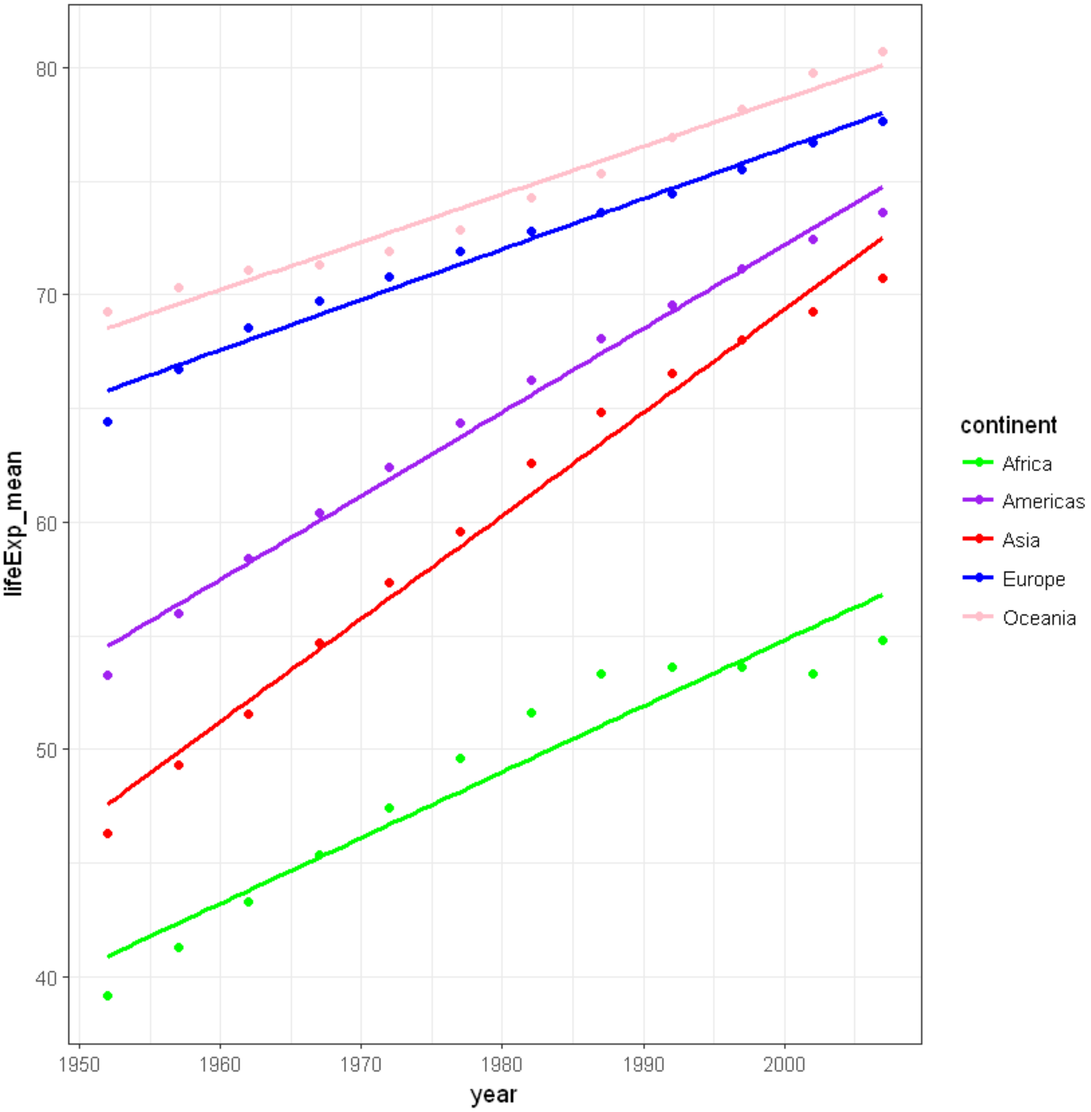
```
Call:
lm(formula = data$year ~ data$lifeExp_mean)

Coefficients:
      (Intercept)  data$lifeExp_mean
        1928.1693             0.8025
```

Let's fit a linear model to expected life expectancy (also let's exclude "Oceania") We use the broom package, which converts statistical analysis objects (for example the lm function or any user defined function) in R into tidy format

```
In [42]: library(broom)
         data %>%
         filter(continent!="Oceania")  %>%  #not interested in Oceania
         do(tidy(lm(lifeExp_mean ~ year, .)))
```

continent	term	estimate	std.error	statistic	p.value
Africa	(Intercept)	-524.2578461	53.64492850	-9.772738	1.961582e-06
Africa	year	0.2895293	0.02709921	10.684047	8.639697e-07
Americas	(Intercept)	-663.1062932	23.87082826	-27.778939	8.478378e-11
Americas	year	0.3676509	0.01205856	30.488791	3.375967e-11
Asia	(Intercept)	-836.8908953	36.46443200	-22.950883	5.567594e-10
Asia	year	0.4531224	0.01842033	24.599037	2.813781e-10
Europe	(Intercept)	-367.4109940	20.09478025	-18.283902	5.149107e-09
Europe	year	0.2219321	0.01015106	21.862960	8.969989e-10

```
In [43]: library(ggplot2)
         ggplot(data, aes(x = year, y = lifeExp_mean, col=continent)) +
         geom_point()  +
         scale_colour_manual(values=setNames(as.character(continent_color$color),as.character(
         geom_smooth(method=lm, se=FALSE, fullrange=TRUE) + #se
         theme_bw()
```


80
70
60
50
40
lifeExp_mean
1950
1960
1970
1980
1990
2000
year
continent
Africa
Americas
Asia
Europe
Oceania