HW2_arflowers

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Homework 2

Problem 2

Part A

Part B

Gamma Density Function:
$f(x|\alpha,\beta) = \frac{1}{\Gamma(\alpha)\beta^{\alpha}} x^{\alpha-1} e^{-x/\beta}, 0 \leq x < \infty, \alpha, \beta > 0$
Chi squared Density Function:
$f(x|p) = \frac{1}{\Gamma(p/2)2^{p/2}} x^{(p-2)-1} e^{-x/2}; 0 \leq x < \infty; p = 1, 2, ...$
Lognormal Density Function:
$f(x|\mu,\sigma^2) = \frac{1}{\sqrt{2\pi}\sigma} \frac{e^{-(\log x - \mu)^2/(2\sigma^2)}}{x}, o \leq x < \infty, -\infty < \mu < \infty$

Problem 3

Problem 4

```
#install.packages('data.table')
library(data.table)
covid_raw <- fread("https://opendata.ecdc.europa.eu/covid19/casedistribution/csv")
us <- covid_raw[covid_raw$countriesAndTerritories == 'United_States_of_America',]
us_filtered <- us[us$month %in% c(6:7),]
us_filtered$index <- rev(1:dim(us_filtered)[1])
fit<-lm(`Cumulative_number_for_14_days_of_COVID-19_cases_per_100000`~index, data=us_filtered)
```

Part A

```
library(knitr)
kable(summary(us_filtered))
```

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	dateRep	day	month	year	cases	deaths	countriesAndTerritories	geoId	countryterritoryCode	popData2019	continentExp	Cumulative_number_for_14_days_of_COVID-19_cases_per_100000	index
	Length:61	Min. : 1.00	Min. :6.000	Min. :2020	Min. :18665	Min. : 242.0	Length:61	Length:61	Length:61	Min. :329064917	Length:61	Min. : 89.76	Min. : 1

dateRep	day	month	year	cases	deaths	countriesAndTerritories	geoId	countryterritoryCode	popData2019	continentExp	Cumulative_number_for_14_days_of_COVID-19_cases_per_100000	index
Class :character	1st Qu.: 8.00	1st Qu.:6.000	1st Qu.:2020	1st Qu.:2540	1st Qu.: 500.0	Class :character	Class :character	Class :character	1st Qu.:329064917	Class :character	1st Qu.: 92.43	1st Qu.:16
Mode :character	Median :16.00	Median :7.000	Median :2020	Median :45221	Median : 767.0	Mode :character	Mode :character	Mode :character	Median :329064917	Mode :character	Median :150.94	Median :31
NA	Mean :15.75	Mean :6.508	Mean :2020	Mean :44666	Mean : 791.6	NA	NA	NA	Mean :329064917	NA	Mean :170.16	Mean :31
NA	3rd Qu.:23.00	3rd Qu.:7.000	3rd Qu.:2020	3rd Qu.:61796	3rd Qu.: 982.0	NA	NA	NA	3rd Qu.:329064917	NA	3rd Qu.:247.01	3rd Qu.:46
NA	Max. :31.00	Max. :7.000	Max. :2020	Max. :78427	Max. :2437.0	NA	NA	NA	Max. :329064917	NA	Max. :282.72	Max. :61

```
library(stargazer)
```

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```
##
## Please cite as:
##  Hlavac, Marek (2018). stargazer: Well-Formatted Regression and Summary Statistics Tables.
##  R package version 5.2.2. https://CRAN.R-project.org/package=stargazer
```

```
#stargazer(fit)
```

Table 2:

	Dependent variable:
	'Cumulative_number_for_14_days_of_COVID-19_cases_per_100000'
index	4.107***
	(0.145)
Constant	42.853***
	(5.165)
Observations	61
R^2	0.932
Adjusted R^2	0.930
Residual Std. Error	19.922 (df = 59)
F Statistic	803.464*** (df = 1; 59)
Note:	*p<0.1; **p<0.05; ***p<0.01

Part B

```
#install.packages("broom")
fit.diags <- broom::augment(fit)
```

Part C

Problem 5

Problem 6