Lab_12

Fantastic Four

Functions Defined

```
#for defining functions (?):
showLevels <- function(data_input){
  return(unique(data_input))
}

summaryStats <- function(data_input,continent_in,start_year,end_year,column_in){
  #main function to return the summary stats for a certain dataset and column for years
  x <- filter(data_input,continent == continent_in,year>=start_year,year<=end_year)
  df <- data.frame(continent_in,start_year,end_year,mean(x[[column_in]]),median(x[[column_in]]),min(x[[
  return(df)
}

calc_summaryStats <- function(data_input,continent_in,start_year,end_year,column_in){
  yearA <- start_year
  output_summary <- 0

  while(yearA < end_year){
    output_summary <- rbind(output_summary, summaryStats(data_input,continent_in,yearA,yearA+9,column_i
    yearA <- yearA + 10
  }
  output_summary <- output_summary[-1,]
  colnames(output_summary) <- c("continent","start_year","end_year","mean","median","minimum","maximum"
  return(output_summary)
}

runAll_calc_summaryStats <- function(data_input,start_year,end_year,column_in){
  #cont = c("Africa","Asia","Americas","Europe","Oceania")
  output_dataframe <- 0
  fun <- showLevels(data_input$continent)
  for(item in fun){
    output_dataframe <- rbind(output_dataframe, calc_summaryStats(gapminder,item,start_year,end_year,co
  }
  return(output_dataframe)

}
```

Main part

```
# Is there a correlation between life expectancy and population size?
runAll_calc_summaryStats(gapminder,1950,2010,"pop")
```

```
## Warning in `[<-.factor`(`*tmp*`, ri, value = 0): invalid factor level, NA
## generated
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```

	continent	start_year	end_year	mean	median	minimum	maximum	IQR
1	<NA>	0	0	0	0	0	0	0
2	Asia	1950	1959	44820272	8203838	120447	637408000	20846678
3	Asia	1960	1969	54576062	10299570	171863	754550000	27870124
4	Asia	1970	1979	68719482	12931057	230800	943455000	37245824
5	Asia	1980	1989	83050854	15603232	377967	1084035000	48710578
6	Asia	1990	1999	98736026	20401150	529491	1230075000	
7	Asia	2000	2009	112329637	23651770	656397	1318683096	
21	Europe	1950	1959	14266853	7319351	147962	71019069	
31	Europe	1960	1969	15692235	7992084	182053	76368453	
41	Europe	1970	1979	16963326	8631284	209275	78717088	
51	Europe	1980	1989	17906018	9002391	233997	78335266	
61	Europe	1990	1999	18784782	9362008	259012	82011073	
71	Europe	2000	2009	19405373	9493598	288030	82400996	
22	Africa	1950	1959	4831522	2768002	60011	37173340	
32	Africa	1960	1969	6075061	3429541	65345	47287752	
42	Africa	1970	1979	7816736	4370963	76595	62209173	
52	Africa	1980	1989	10328680	5964650	98593	81551520	
62	Africa	1990	1999	13489563	7426107	125911	106207839	
72	Africa	2000	2009	16954458	9444674	170372	135031164	
23	Americas	1950	1959	14642127	3206613	662850	171984000	
33	Americas	1960	1969	18280338	4129002	887498	198712000	
43	Americas	1970	1979	22149038	5114648	975199	220239000	
53	Americas	1980	1989	26260898	6276000	1116479	242803533	
63	Americas	1990	1999	30723490	7842772	1138101	272911760	
73	Americas	2000	2009	34972879	9219387	1056608	301139947	
24	Oceania	1950	1959	5656996	5460310	1994794	9712569	
34	Oceania	1960	1969	6970983	6761559	2488550	11872264	
44	Oceania	1970	1979	8336275	8170950	2929100	14074100	
54	Oceania	1980	1989	9492316	9250683	3210650	16257249	
64	Oceania	1990	1999	10790270	10579082	3437674	18565243	
74	Oceania	2000	2009	12001194	11831282	3908037	20434176	

```
## 6  57510224
## 7  62670570
## 21 13157090
## 31 14681830
## 41 16616303
## 51 17972563
## 61 18139442
## 71 17699132
## 22  4570694
## 32  5555404
## 42  7031434
## 52  9319183
## 62 12337988
## 72 16022490
## 23  7095482
## 33  9400275
## 43 12627520
## 53 16328351
## 63 20034263
## 73 22919452
## 24  6775798
## 34  8396042
## 44 10295325
## 54 12161925
## 64 14136235
## 74 15704800
```

SubQ1

```
# How does life expectancy vary by continent and by decade? Write functions and employ iteration to cal

temp <- runAll_calc_summaryStats(gapminder,1950,2010,"lifeExp")
```

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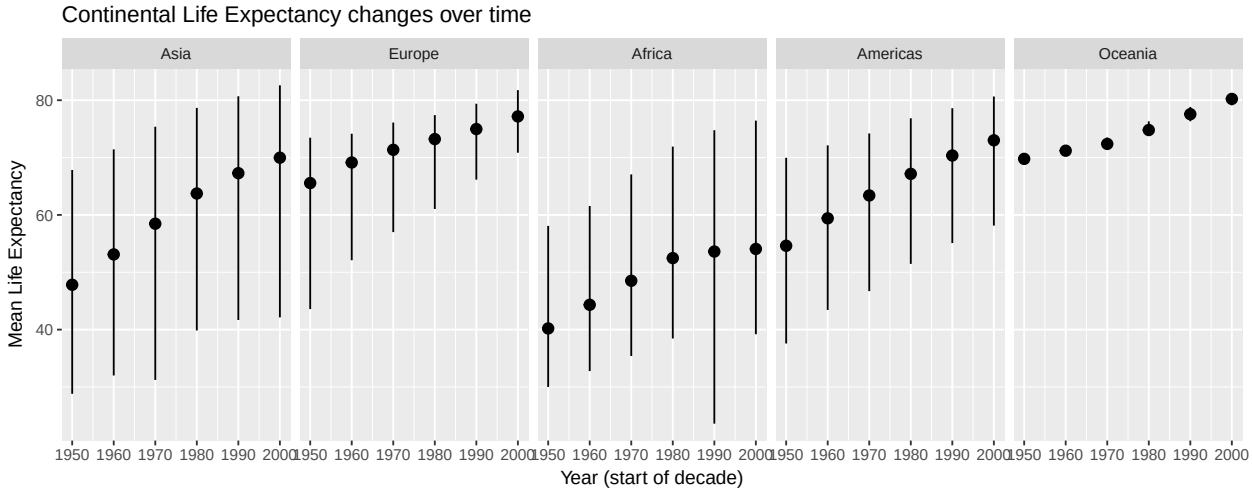
```

```
temp <- temp %>% group_by(continent)
temp <- temp[-1,]
```

```
ggplot(data=temp) + geom_pointrange(mapping=aes(x=start_year,y=mean,ymin=minimum,ymax=maximum)) +facet_
```



SubQ1

```
# How does GDP per capita vary by continent and by decade? Write functions and employ iteration to calc

runAll_calc_summaryStats(gapminder,1950,2010,"gdpPercap")
```

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## generated
```

```
##    continent start_year end_year      mean    median    minimum    maximum
## 1       <NA>          0        0     0.000     0.000     0.0000      0.000
## 2       Asia       1950     1959  5491.608  1497.727   331.0000 113523.133
## 3       Asia       1960     1969  5850.271  1852.401   349.0000  95458.112
## 4       Asia       1970     1979  7989.391  2850.723   357.0000 109347.867
## 5       Asia       1980     1989  7521.181  4106.509   385.0000  33693.175
## 6       Asia       1990     1999  9236.892  3685.722   347.0000  40300.620
## 7       Asia       2000     2009 11323.559  4287.633   611.0000  47306.990
## 21    Europe       1950     1959  6312.035  5730.677   973.5332  17909.490
## 31    Europe       1960     1969  9254.655  8463.000  1709.6837  22966.144
```

```
## 41    Europe       1970     1979 13381.777 13044.562  2860.1698  27195.113
## 51    Europe       1980     1989 16416.104 15995.703  3630.8807  31540.975
## 61    Europe       1990     1999 18069.175 18122.048  2497.4379  41283.164
## 71    Europe       2000     2009 23383.107 26653.335  4604.2117  49357.190
## 22    Africa       1950     1959  1318.904  1024.023   298.8462   5487.104
## 32    Africa       1960     1969  1824.221  1191.555   355.2032  18772.752
## 42    Africa       1970     1979  2462.777  1402.376   464.0995  21951.212
## 52    Africa       1980     1989  2382.131  1286.173   389.8762  17364.275
## 62    Africa       1990     1999  2330.285  1179.883   312.1884  14722.842
## 72    Africa       2000     2009  2844.209  1307.562   241.1659  13206.485
## 23  Americas       1950     1959  4347.553  3266.944  1397.7171  14847.127
## 33  Americas       1960     1969  5284.898  4549.084  1452.0577  19530.366
## 43  Americas       1970     1979  6921.671  5490.198  1654.4569  24072.632
## 53  Americas       1980     1989  7650.069  6397.723  1823.0160  29884.350
## 63  Americas       1990     1999  8467.118  6813.664  1341.7269  35767.433
## 73  Americas       2000     2009 10145.354  7382.469  1201.6372  42951.653
## 24   Oceania       1950     1959 10948.304 10753.113 10039.5956  12247.395
## 34   Oceania       1960     1969 13595.737 13819.798 12217.2269  14526.125
## 44   Oceania       1970     1979 16850.645 16511.174 16046.0373  18334.198
## 54   Oceania       1980     1989 19501.375 19242.100 17632.4104  21888.889
## 64   Oceania       1990     1999 22459.111 22237.590 18363.3249  26997.937
## 74   Oceania       2000     2009 28374.483 27936.382 23189.8014  34435.367
##           IQR
## 1      0.0000
## 2   2297.9368
## 3   4085.0329
## 4   8539.1421
## 5  11165.1958
## 6  15728.0982
## 7  18938.5251
## 21  4956.2819
## 31  6811.9320
## 41  8352.9485
## 51  9922.0911
## 61 16830.2216
## 71 20705.2445
## 22   950.0916
## 32  1104.8081
## 42  1724.7493
## 52  1983.9259
## 62  2069.0063
## 72  2826.6352
## 23  2205.0266
## 33  2799.6370
## 43  3124.1509
## 53  4300.9379
## 63  4848.2282
## 73  5542.2684
## 24   846.7554
## 34  1543.4051
## 44   988.2239
## 54  1416.4832
## 64  3939.4177
## 74  6938.4507
```

Contributions

- Lindsay:
- Lexie:
- Li:
- Scott: