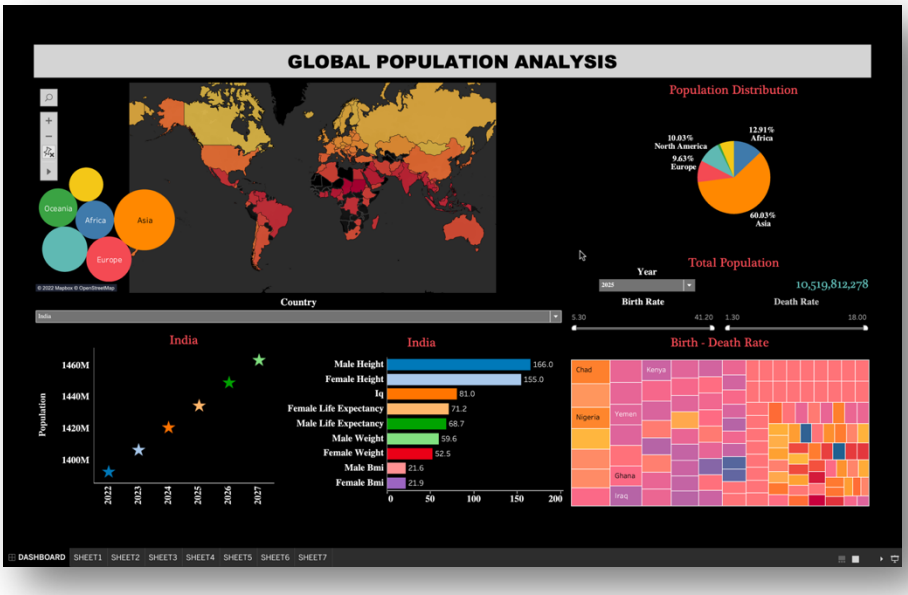
LAB EVALUATION - 2

TABLEAU DASHBOARD

GLOBAL POPULATION ANALYSIS



DASHBOARD LINK:

https://public.tableau.com/views/Dashboard_16689535501990/DASHBOARD?:language=en-GB&publish=yes&:display_count=n&:origin=viz_share_link

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Datasets:

Reading of Tables

```r
library(dplyr)
library(writexl)

#reading data from datasets
continents <- read.csv('datasets/Countries-Continents.csv')
heights <- read.csv('datasets/height_weight_data.csv')
iq <- read.csv('datasets/iq.csv')
life_exp <- read.csv('datasets/life_expectancy.csv')
pop_dens <- read.csv('datasets/population_density.csv')
pop_change <- read.csv('datasets/pop_change.csv')
```

Table 1

Queries.R | continents

Filter

	continent	country
1	Africa	Algeria
2	Africa	Angola
3	Africa	Benin
4	Africa	Botswana
5	Africa	Burkina
6	Africa	Burundi
7	Africa	Cameroon
8	Africa	Cape Verde
9	Africa	Central African Republic
10	Africa	Chad
11	Africa	Comoros
12	Africa	Congo
13	Africa	Congo (Dem. Republic)
14	Africa	Djibouti
15	Africa	Egypt
16	Africa	Equatorial Guinea
17	Africa	Eritrea
18	Africa	Ethiopia
19	Africa	Gabon
20	Africa	Gambia

Showing 1 to 20 of 194 entries, 2 total columns

Table 2

Queries.R | heights | continents

Filter

	country	male_height	female_height	male_weight	female_weight	male_bmi
1	Netherlands	184	170	87.9	73.2	26.1
2	Montenegro	183	170	90.4	75.3	27.0
3	Estonia	182	*NA*	89.9	73.7	27.0
4	Denmark	182	169	86.8	70.2	26.3
5	Bosnia and Herzegovina	182	167	87.1	70.6	26.4
6	Iceland	181	168	89.2	72.6	*NA*
7	Czechia	181	168	91.9	74.2	28.1
8	Slovenia	181	167	*NA*	74.2	26.6
9	Slovakia	*NA*	167	89.5	71.3	27.4
10	Croatia	181	167	91.3	74.7	28.0
11	Serbia	180	168	86.9	72.6	26.7
12	Sweden	180	167	87.1	*NA*	26.8
13	Norway	180	*NA*	89.1	72.6	27.4
14	Lithuania	180	167	88.1	73.1	27.1
15	Poland	180	165	89.0	71.5	27.4
16	Ukraine	180	166	87.6	72.9	*NA*
17	Finland	180	166	86.3	71.0	26.6
18	Latvia	*NA*	168	87.9	74.5	27.1
19	Germany	180	166	88.7	71.7	27.4
20	Dominica	180	167	80.7	80.8	25.0

Showing 1 to 20 of 126 entries, 6 total columns

Table 3

Queries.R | iq | heights | continents

Filter

	country	iq	education_expenditure_per_inhabitant	daily_max_temp
1	Singapore	108	908	31.5
2	Hong Kong	108	915	26.2
3	Taiwan	106		26.9
4	South Korea	106	537	18.2
5	Japan	105	1,258	19.2
6	China	104	27	19.0
7	Switzerland	102	2,539	15.1
8	Netherlands	102	1,701	14.4
9	North Korea	102		15.2
10	Macao	101	628	26.0
11	Iceland	101	2,443	8.1
12	Finland	101	1,990	8.2
13	Canada	101	1,661	7.3
14	Belgium	100	1,676	14.8
15	Germany	100	1,385	13.7
16	United Kingdom	100	1,455	12.9
17	Austria	100	1,764	13.1
18	New Zealand	100	1,283	17.3
19	Norway	99	3,527	9.0
20	Sweden	99	2,359	9.9

Showing 1 to 20 of 108 entries, 4 total columns

Table 4

Queries.R | life_exp | iq | heights | continents

Filter

	country	male_life_expectancy	female_life_expectancy	birth_rate	death_rate
1	Hong Kong	82.9	88.0	5.8	6.8
2	Iceland	81.7	84.5	12.3	7.8
3	Japan	81.6	87.7	6.8	8.8
4	Norway	81.6	84.9	9.8	9.8
5	Singapore	81.5	86.1	8.5	10.8
6	Macao	81.4	87.3	10.7	4.1
7	Australia	81.2	85.3	11.5	6.3
8	Switzerland	81.1	85.2	9.9	8.8
9	Malta	80.8	84.6	8.6	7.9
10	Israel	80.7	84.8	19.2	5.3
11	Sweden	80.7	84.2	10.9	9.5
12	South Korea	80.5	86.5	5.3	5.9
13	Ireland	80.4	84.1	11.2	6.4
14	New Zealand	80.3	83.9	11.3	6.4
15	Italy	80.1	84.7	6.8	12.6
16	Netherlands	79.8	83.1	9.7	9.7
17	Canada	79.7	83.9	9.4	8.1
18	Spain	79.7	85.1	7.1	10.4
19	Denmark	79.6	83.6	10.4	9.4
20	Luxembourg	79.4	84.2	10.2	7.3

Showing 1 to 20 of 115 entries, 5 total columns

Table 5

Queries.R | pop_dens | life_exp | iq | heights | continents

Filter

	country	area	population	pop_per_km_sq
1	Macao	30.0	0.66 M	21657.6
2	Monaco	2.0	0.04 M	19564.4
3	Singapore	719.0	5.45 M	7584.9
4	Hong Kong	1110.0	7.41 M	6678.5
5	Gibraltar	6.8	0.03 M	4954.6
6	Holy See (Vatican City)	0.4	0.00 M	2272.7
7	Bahrain	778.0	1.75 M	2247.2
8	Maldives	300.0	0.54 M	1812.1
9	Malta	320.0	0.52 M	1615.2
10	Saint Martin	34.0	0.04 M	1260.2
11	Bermuda	53.0	0.06 M	1200.5
12	Bangladesh	147630.0	166.30 M	1126.5
13	Guernsey	78.0	0.07 M	865.3
14	Jersey	120.0	0.10 M	854.1
15	Palestine	6020.0	4.92 M	817.7
16	St. Martin	53.0	0.04 M	737.6
17	Mayotte	374.0	0.26 M	685.9
18	Barbados	430.0	0.29 M	669.1
19	Taiwan	35980.0	23.58 M	655.4
20	Lebanon	10450.0	6.77 M	647.8

Showing 1 to 20 of 91 entries, 4 total columns

Table 6

Queries.R | pop_change | pop_dens | life_exp | iq | heights | continents

Filter

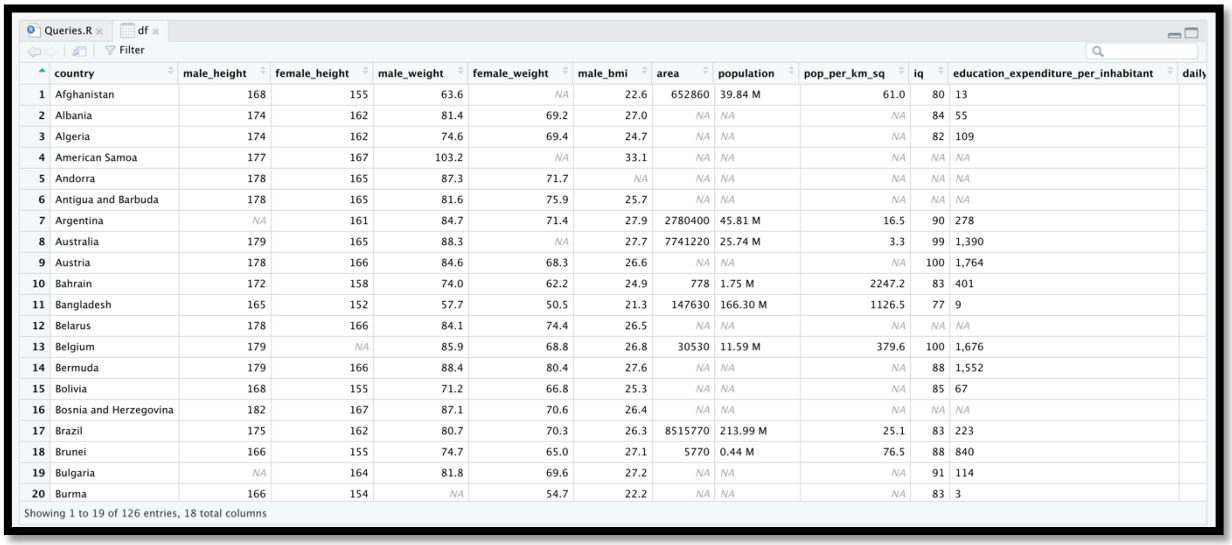
	country	population_change
1	China	0.39%
2	India	0.99%
3	United States	0.59%
4	Indonesia	1.07%
5	Pakistan	2.00%
6	Brazil	0.72%
7	Nigeria	2.58%
8	Bangladesh	1.01%
9	Russia	0.04%
10	Mexico	1.06%
11	Japan	-0.30%
12	Ethiopia	2.57%
13	Philippines	1.35%
14	Egypt	1.94%
15	Vietnam	0.91%
16	DR Congo	3.19%
17	Turkey	1.09%
18	Iran	1.30%
19	Germany	0.32%
20	Thailand	0.25%

Showing 1 to 20 of 236 entries, 2 total columns

Joining Unprocessed Tables:

```
12  #joining the datasets on basis of country
13  df1 <- merge(x=heights,y=pop_dens,by="country",all.x=TRUE)
14  df2 <- merge(x=df1,y=iq,by="country",all.x=TRUE)
15  df3 <- merge(x=df2,y=life_exp,by="country",all.x=TRUE)
16  df4 <- merge(x=df3,y=continents,by="country",all.x=TRUE)
17  df <- merge(x=df4,y=pop_change,by="country",all.x=TRUE)
18
```

Unprocessed merged Table:



Queries.R | df

Filter

	country	male_height	female_height	male_weight	female_weight	male_bmi	area	population	pop_per_km_sq	iq	education_expenditure_per_inhabitant	daily
1	Afghanistan	168	155	63.6	NA	22.6	652860	39.84 M	61.0	80	13	
2	Albania	174	162	81.4	69.2	27.0	NA	NA	NA	84	55	
3	Algeria	174	162	74.6	69.4	24.7	NA	NA	NA	82	109	
4	American Samoa	177	167	103.2	NA	33.1	NA	NA	NA	NA	NA	
5	Andorra	178	165	87.3	71.7	NA	NA	NA	NA	NA	NA	
6	Antigua and Barbuda	178	165	81.6	75.9	25.7	NA	NA	NA	NA	NA	
7	Argentina	NA	161	84.7	71.4	27.9	2780400	45.81 M	16.5	90	278	
8	Australia	179	165	88.3	NA	27.7	7741220	25.74 M	3.3	99	1,390	
9	Austria	178	166	84.6	68.3	26.6	NA	NA	NA	100	1,764	
10	Bahrain	172	158	74.0	62.2	24.9	778	1.75 M	2247.2	83	401	
11	Bangladesh	165	152	57.7	50.5	21.3	147630	166.30 M	1126.5	77	9	
12	Belarus	178	166	84.1	74.4	26.5	NA	NA	NA	NA	NA	
13	Belgium	179	NA	85.9	68.8	26.8	30530	11.59 M	379.6	100	1,676	
14	Bermuda	179	166	88.4	80.4	27.6	NA	NA	NA	88	1,552	
15	Bolivia	168	155	71.2	66.8	25.3	NA	NA	NA	85	67	
16	Bosnia and Herzegovina	182	167	87.1	70.6	26.4	NA	NA	NA	NA	NA	
17	Brazil	175	162	80.7	70.3	26.3	8515770	213.99 M	25.1	83	223	
18	Brunei	166	155	74.7	65.0	27.1	5770	0.44 M	76.5	88	840	
19	Bulgaria	NA	164	81.8	69.6	27.2	NA	NA	NA	91	114	
20	Burma	166	154	NA	54.7	22.2	NA	NA	NA	83	3	

Showing 1 to 19 of 126 entries, 18 total columns

Data Pre-Processing:

```r
#listing the countries whose continent data is not available
df$country[is.na(df$continent)]

#manually adding information of countries whose continent data is missing
df$continent[df$country=="Czechia"]="Europe"
df$continent[df$country=="Bermuda"]="North America"
df$continent[df$country=="Hong Kong"]="Asia"
df$continent[df$country=="Russia"]="Asia"
df$continent[df$country=="American Samoa"]="Oceania"
df$continent[df$country=="Cook Islands"]="Oceania"
df$continent[df$country=="French Polynesia"]="Oceania"
df$continent[df$country=="Taiwan"]="Asia"
df$continent[df$country=="Niue"]="Oceania"
df$continent[df$country=="Puerto Rico"]="North America"
df$continent[df$country=="Tokelau"]="Oceania"

#removing the unit information from population
#For example the population data of India before preprocessing is "1393.41 M"
#but after running the query it will convert to "1393.41"
df$population <- sapply(df$population, function(x) substring(x, 1, nchar(x) - 2))

#converting population data type from string to double format
df$population <- as.double(df$population)

```

```r
#grouping countries by continent
df_cont <- group_by(df,continent)

#replacing the NA values of male height with mean value of male heights w.r.t continent
df_male_height <- summarise(df_cont,height = mean(male_height, na.rm = TRUE))
for(x in df_male_height$continent)
{
  a <- is.na(df$male_height)
  b <- df$continent==x
  df$male_height[a&b] = trunc(df_male_height$height[df_male_height$continent==x])
}

#replacing the NA values of female height with mean value of female heights w.r.t continent
df_female_height<-summarise(df_cont,height=mean(female_height, na.rm = TRUE))
for(x in df_female_height$continent)
{
  a<-is.na(df$female_height)
  b<-df$continent==x
  df$female_height[a&b]=trunc(df_female_height$height[df_female_height$continent==x])
}
```

```r
#replacing the NA values of male weight with mean value of male weights w.r.t continent
df_male_weight<-summarise(df_cont,weight=mean(male_weight, na.rm = TRUE))
for(x in df_male_weight$continent)
{
  a<-is.na(df$male_weight)
  b<-df$continent==x
  df$male_weight[a&b]=round(df_male_weight$weight[df_male_weight$continent==x],1)
}

#replacing the NA values of female weight with mean value of female weights w.r.t continent
df_female_weight<-summarise(df_cont,weight=mean(female_weight, na.rm = TRUE))
for(x in df_female_weight$continent)
{
  a<-is.na(df$female_weight)
  b<-df$continent==x
  df$female_weight[a&b]=round(df_female_weight$weight[df_female_weight$continent==x],1)
}

#adding female BMI information by using the formula: weight/(height)^2
df <- mutate(df,female_bmi=round(female_weight*100*100/(female_height*female_height),1))

#replacing the NA values of male BMI with the the value calculated using the formula: weight/(height)^2
df$male_bmi <- round(mapply(function(x,y,z) if(is.na(x)){y*100*100/(z*z)} else {x},df$male_bmi,df$male_weight,df$male_height),1)

#replacing the NA values of IQ with its mean value across the world
df$iq[is.na(df$iq)] <- round(mean(df$iq, na.rm=TRUE), 1)
```

```r
#converting education expenditure from string to numeric format
df$education_expenditure_per_inhabitant <- as.numeric(df$education_expenditure_per_inhabitant)

#replacing the NA values of education expenditure with its median value across the world
df$education_expenditure_per_inhabitant[is.na(df$education_expenditure_per_inhabitant)] <-
  round(median(df$education_expenditure_per_inhabitant, na.rm=TRUE),0)

#replacing the NA values of max temperature with mean value of max temperature w.r.t continent
df_temp<-summarise(df_cont,temp=mean(daily_max_temp, na.rm = TRUE))
for(x in df_temp$continent)
{
  a<-is.na(df$daily_max_temp)
  b<-df$continent==x
  df$daily_max_temp[a&b]=round(df_temp$temp[df_temp$continent==x],1)
}

#replacing the NA values of male life expectancy with its median value across the world
df$male_life_expectancy[is.na(df$male_life_expectancy)] <- round(median(df$male_life_expectancy, na.rm=TRUE),1)

#replacing the NA values of female life expectancy with its median value across the world
df$female_life_expectancy[is.na(df$female_life_expectancy)] <- round(median(df$female_life_expectancy, na.rm=TRUE),1)

#replacing the NA values of birth rate with its median value across the world
df$birth_rate[is.na(df$birth_rate)] <- round(median(df$birth_rate, na.rm=TRUE),1)

#replacing the NA values of death rate with its median value across the world
df$death_rate[is.na(df$death_rate)] <- round(median(df$death_rate, na.rm=TRUE),1)
```

```r
#replacing the NA values of area of a country with its mean of total area covered by countries across the world
df$area[is.na(df$area)] <- round(mean(df$area, na.rm=TRUE),1)

#replacing the NA values of a country's population with mean of country population w.r.t the continent in which it is situated
df_pop<-summarise(df_cont,pop=mean(population, na.rm = TRUE))
for(x in df_pop$continent)
{
  a<-is.na(df$population)
  b<-df$continent==x
  df$population[a&b]=round(df_pop$pop[df_pop$continent==x],1)
}

#replacing the missing values of population per sq km with the the value calculated using country population and its area
df$pop_per_km_sq <- round(mapply(function(x,y,z) if(is.na(x)){y*1000000/z} else {x},df$pop_per_km_sq,df$population,df$area),1)

#reordering the columns
df <- df[,c(1,17,7:9,18,12,2:6,19,13:16,10)]
```

Processed Merged Table:

Queries.R* | df

Filter

	country	continent	area	population	pop_per_km_sq	population_change	daily_max_temp	male_height	female_height	male_weight	female_weight	male_bmi
1	Afghanistan	Asia	652860	39.84	61.0	2.33%	24.4	168	155	63.6	62.6	
2	Albania	Europe	1388170	25.90	18.7	-0.11%	21.2	174	162	81.4	69.2	
3	Algeria	Africa	1388170	69.40	50.0	1.85%	26.5	174	162	74.6	69.4	
4	American Samoa	Oceania	1388170	7.70	5.5	-0.22%	20.9	177	167	103.2	85.1	
5	Andorra	Europe	1388170	25.90	18.7	0.16%	15.5	178	165	87.3	71.7	
6	Antigua and Barbuda	North America	1388170	85.40	61.5	0.84%	21.8	178	165	81.6	75.9	
7	Argentina	South America	2780400	45.81	16.5	0.93%	23.9	171	161	84.7	71.4	
8	Australia	Oceania	7741220	25.74	3.3	1.18%	24.4	179	165	88.3	85.1	
9	Austria	Europe	1388170	25.90	18.7	0.57%	13.1	178	166	84.6	68.3	
10	Bahrain	Asia	778	1.75	2247.2	3.68%	32.6	172	158	74.0	62.2	
11	Bangladesh	Asia	147630	166.30	1126.5	1.01%	29.8	165	152	57.7	50.5	
12	Belarus	Europe	1388170	25.90	18.7	-0.03%	15.5	178	166	84.1	74.4	
13	Belgium	Europe	30530	11.59	379.6	0.44%	14.8	179	165	85.9	68.8	
14	Bermuda	North America	1388170	85.40	61.5	-0.36%	24.6	179	166	88.4	80.4	
15	Bolivia	South America	1388170	92.60	66.7	1.39%	27.0	168	155	71.2	66.8	
16	Bosnia and Herzegovina	Europe	1388170	25.90	18.7	-0.61%	15.5	182	167	87.1	70.6	
17	Brazil	South America	8515770	213.99	25.1	0.72%	30.7	175	162	80.7	70.3	
18	Brunei	Asia	5770	0.44	76.5	0.97%	31.7	166	155	74.7	65.0	
19	Bulgaria	Europe	1388170	25.90	18.7	-0.74%	18.1	179	164	81.8	69.6	
20	Burma	Asia	1388170	170.30	122.7	0.67%	32.2	166	154	71.5	54.7	

Showing 1 to 19 of 126 entries, 18 total columns

Tableau implementation:

SHEET 1:

Visualizing Birth rate and death rate of each country using highlight table.

Generating Dataset for sheet 1:

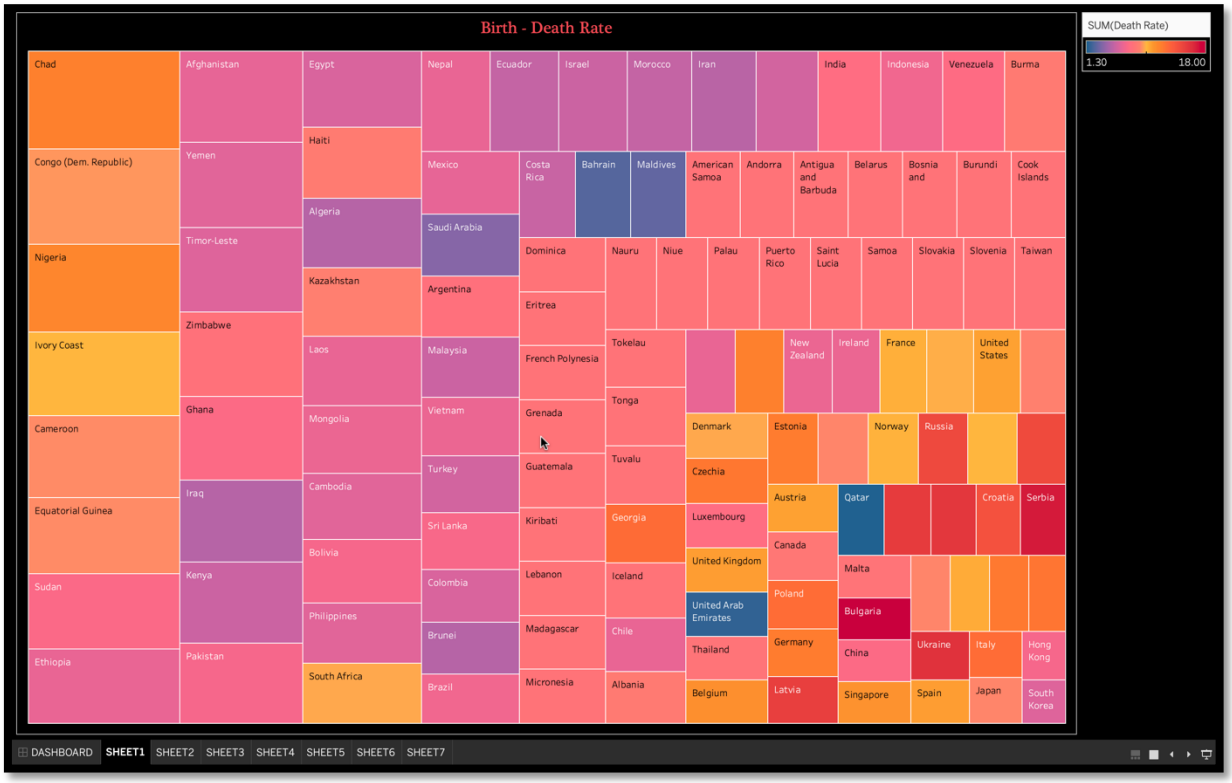
```
sheet1 <- df[,c('continent', 'country', 'birth_rate', 'death_rate')]
write_xlsx(sheet1,"sheet1.xlsx")
```

Queries.R* | sheet1

Filter

	continent	country	birth_rate	death_rate
1	Asia	Afghanistan	31.2	6.2
2	Europe	Albania	11.5	8.3
3	Africa	Algeria	22.8	4.7
4	Oceania	American Samoa	13.0	7.8
5	Europe	Andorra	13.0	7.8
6	North America	Antigua and Barbuda	13.0	7.8
7	South America	Argentina	16.6	7.6
8	Oceania	Australia	11.5	6.3
9	Europe	Austria	9.4	10.3
10	Asia	Bahrain	13.3	2.4
11	Asia	Bangladesh	17.5	5.5
12	Europe	Belarus	13.0	7.8
13	Europe	Belgium	9.9	11.0
14	North America	Bermuda	8.4	8.8
15	South America	Bolivia	21.2	6.8
16	Europe	Bosnia and Herzegovina	13.0	7.8
17	South America	Brazil	13.5	6.6
18	Asia	Brunei	14.1	4.7
19	Europe	Bulgaria	8.5	18.0
20	Asia	Burma	17.2	8.3

Showing 1 to 20 of 126 entries, 4 total columns



Color shows death rate and size of each block shows birth rate i.e., darker color shows higher death rate whereas larger size of block depicts higher birth rate.

SHEET 2:
Visualizing population distribution using pie chart.

Generating Dataset for sheet 2:

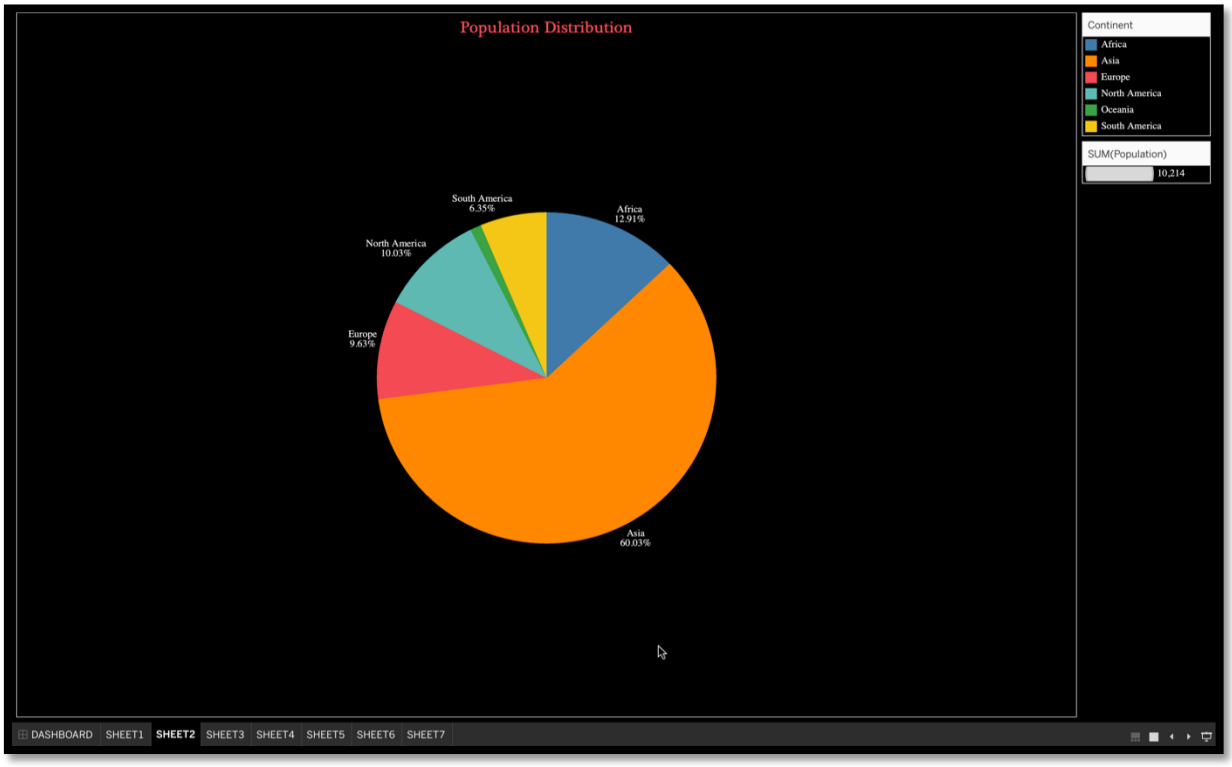
```
147  sheet2 <- df[,c('continent', 'country', 'population')]
148  write_xlsx(sheet2,"sheet2.xlsx")
```

Queries.R* | sheet1 | sheet2

Filter

	continent	country	population
1	Asia	Afghanistan	39.84
2	Europe	Albania	25.90
3	Africa	Algeria	69.40
4	Oceania	American Samoa	7.70
5	Europe	Andorra	25.90
6	North America	Antigua and Barbuda	85.40
7	South America	Argentina	45.81
8	Oceania	Australia	25.74
9	Europe	Austria	25.90
10	Asia	Bahrain	1.75
11	Asia	Bangladesh	166.30
12	Europe	Belarus	25.90
13	Europe	Belgium	11.59
14	North America	Bermuda	85.40
15	South America	Bolivia	92.60
16	Europe	Bosnia and Herzegovina	25.90
17	South America	Brazil	213.99
18	Asia	Brunei	0.44
19	Europe	Bulgaria	25.90
20	Asia	Burma	170.30

Showing 1 to 20 of 126 entries, 3 total columns



SHEET 3:

Visualizing continent area using bubble chart.

Generating Dataset for sheet 3:

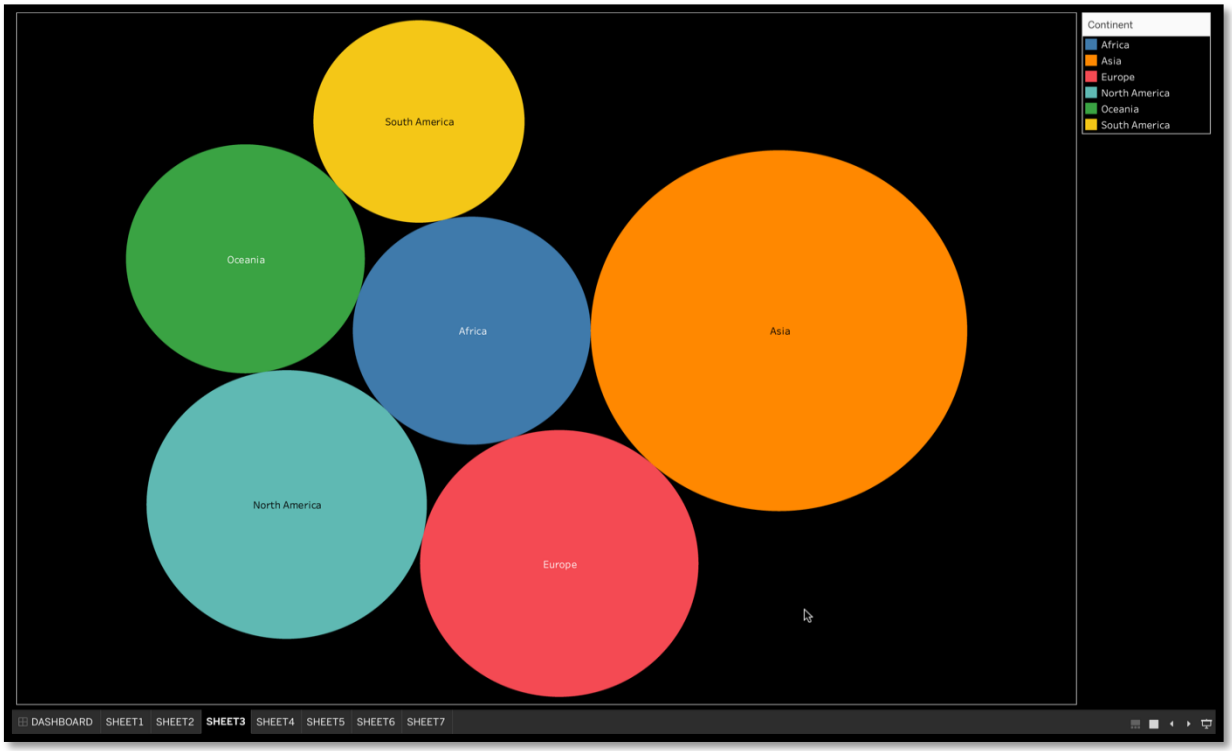
```
151
152  sheet3 <- df[,c('continent', 'country', 'area')]
153  write_xlsx(sheet3,"sheet3.xlsx")
154
```

Queries.R* | sheet3 | sheet1 | sheet2

Filter

	continent	country	area
1	Asia	Afghanistan	652860
2	Europe	Albania	1388170
3	Africa	Algeria	1388170
4	Oceania	American Samoa	1388170
5	Europe	Andorra	1388170
6	North America	Antigua and Barbuda	1388170
7	South America	Argentina	2780400
8	Oceania	Australia	7741220
9	Europe	Austria	1388170
10	Asia	Bahrain	778
11	Asia	Bangladesh	147630
12	Europe	Belarus	1388170
13	Europe	Belgium	30530
14	North America	Bermuda	1388170
15	South America	Bolivia	1388170
16	Europe	Bosnia and Herzegovina	1388170
17	South America	Brazil	8515770
18	Asia	Brunei	5770
19	Europe	Bulgaria	1388170
20	Asia	Burma	1388170

Showing 1 to 20 of 126 entries, 3 total columns



Greater size of bubble implies greater area.

SHEET 4:
Visualizing country wise demographics using bar chart.

Generating Dataset for sheet 4:

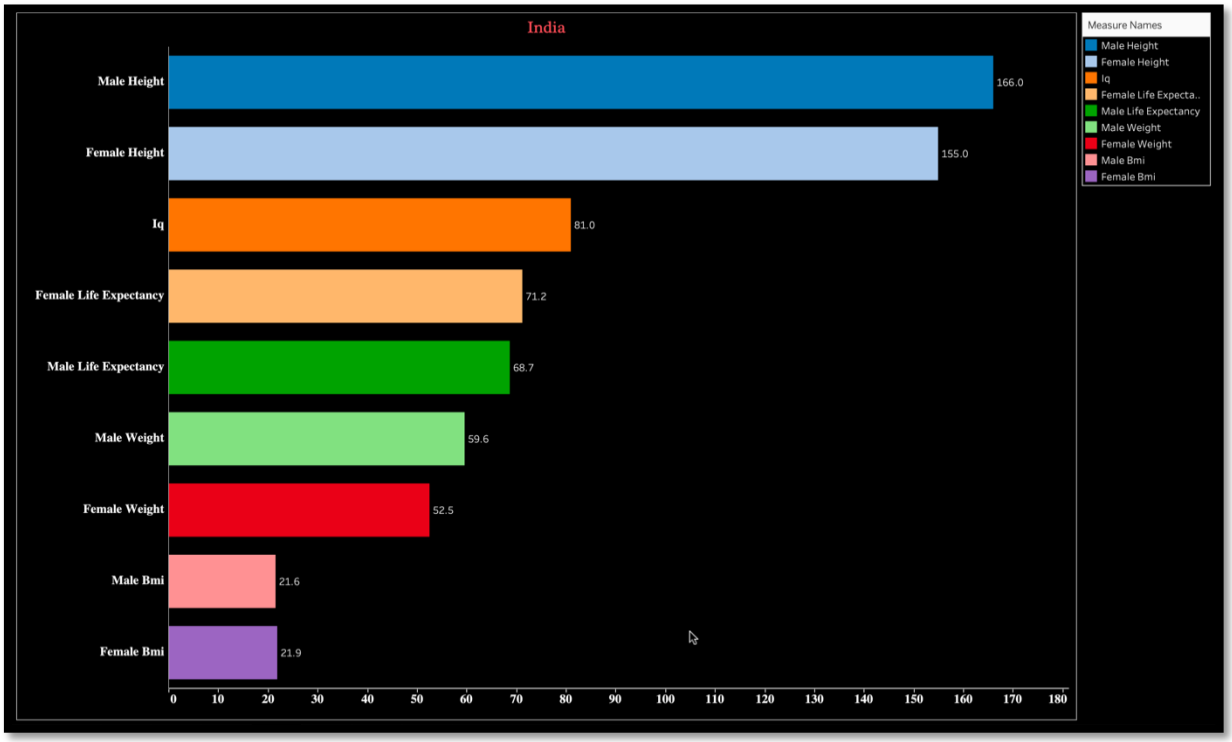
```
157 sheet4 <- df[,c('continent', 'country', 'male_height', 'female_height', 'male_weight', 'female_weight',
158                 'male_bmi', 'female_bmi', 'male_life_expectancy', 'female_life_expectancy', 'iq')]
159 write_xlsx(sheet4,"sheet4.xlsx")
```

Queries.R* | sheet4 | sheet3 | sheet1 | sheet2

Filter

	continent	country	male_height	female_height	male_weight	female_weight	male_bmi	female_bmi	male_life_expectanc
1	Asia	Afghanistan	168	155	63.6	62.6	22.6	26.1	
2	Europe	Albania	174	162	81.4	69.2	27.0	26.4	
3	Africa	Algeria	174	162	74.6	69.4	24.7	26.4	
4	Oceania	American Samoa	177	167	103.2	85.1	33.1	30.5	
5	Europe	Andorra	178	165	87.3	71.7	27.6	26.3	
6	North America	Antigua and Barbuda	178	165	81.6	75.9	25.7	27.9	
7	South America	Argentina	171	161	84.7	71.4	27.9	27.5	
8	Oceania	Australia	179	165	88.3	85.1	27.7	31.3	
9	Europe	Austria	178	166	84.6	68.3	26.6	24.8	
10	Asia	Bahrain	172	158	74.0	62.2	24.9	24.9	
11	Asia	Bangladesh	165	152	57.7	50.5	21.3	21.9	
12	Europe	Belarus	178	166	84.1	74.4	26.5	27.0	
13	Europe	Belgium	179	165	85.9	68.8	26.8	25.3	
14	North America	Bermuda	179	166	88.4	80.4	27.6	29.2	
15	South America	Bolivia	168	155	71.2	66.8	25.3	27.8	
16	Europe	Bosnia and Herzegovina	182	167	87.1	70.6	26.4	25.3	
17	South America	Brazil	175	162	80.7	70.3	26.3	26.8	
18	Asia	Brunei	166	155	74.7	65.0	27.1	27.1	
19	Europe	Bulgaria	179	164	81.8	69.6	27.2	25.9	
20	Asia	Burma	166	154	71.5	54.7	22.2	23.1	

Showing 1 to 19 of 126 entries, 11 total columns



SHEET 5:

Visualizing max temperature of various countries using world map.

Generating Dataset for sheet 5:

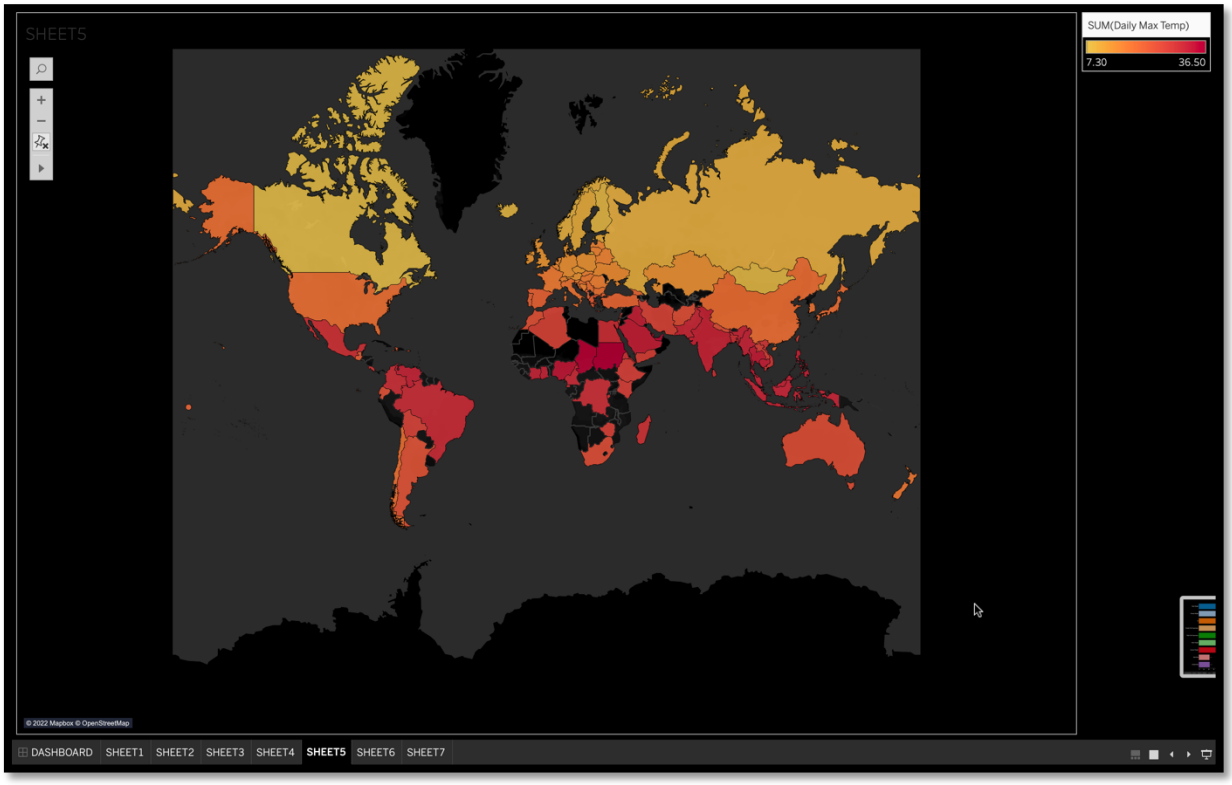
```
write_xlsx(sheet5,"sheet5.xlsx")
sheet5 <- df[,c('continent', 'country', 'area', 'daily_max_temp')]
```

Queries.R* | sheet4 | sheet5 | sheet3 | sheet1 | sheet2

Filter

	continent	country	area	daily_max_temp
1	Asia	Afghanistan	652860	24.4
2	Europe	Albania	1388170	21.2
3	Africa	Algeria	1388170	26.5
4	Oceania	American Samoa	1388170	20.9
5	Europe	Andorra	1388170	15.5
6	North America	Antigua and Barbuda	1388170	21.8
7	South America	Argentina	2780400	23.9
8	Oceania	Australia	7741220	24.4
9	Europe	Austria	1388170	13.1
10	Asia	Bahrain	778	32.6
11	Asia	Bangladesh	147630	29.8
12	Europe	Belarus	1388170	15.5
13	Europe	Belgium	30530	14.8
14	North America	Bermuda	1388170	24.6
15	South America	Bolivia	1388170	27.0
16	Europe	Bosnia and Herzegovina	1388170	15.5
17	South America	Brazil	8515770	30.7
18	Asia	Brunei	5770	31.7
19	Europe	Bulgaria	1388170	18.1
20	Asia	Burma	1388170	32.2

Showing 1 to 20 of 126 entries, 4 total columns



Darker color depicts hotter region while lighter color depicts colder regions. We can also see its area by hovering over any country.

SHEET 6:

Visualizing population growth of each country using scatter plot.

Generating Dataset for sheet 6:

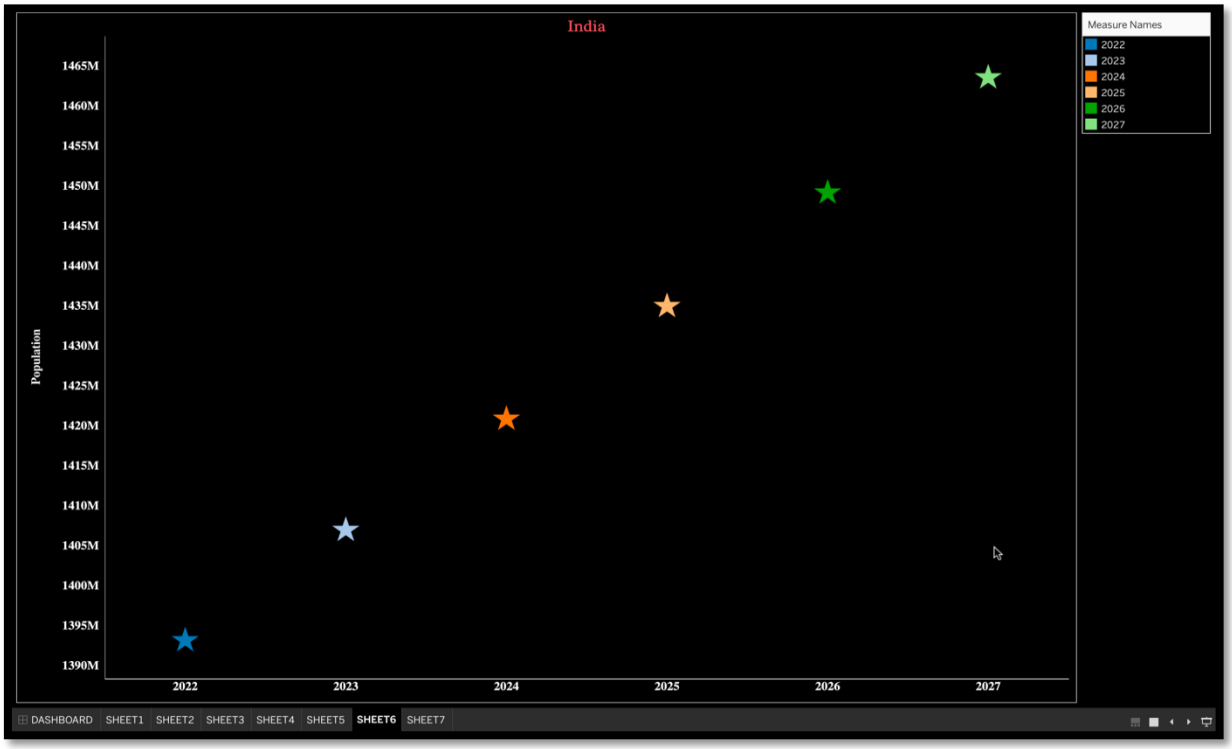
```
167
168 write_xlsx(sheet6,"sheet6.xlsx")
169 sheet6 <- df[,c('continent', 'country', 'population', 'population_change')]
170
```

Queries.R* | sheet4 | sheet5 | sheet6 | sheet3 | sheet1 | sheet2

Filter

	continent	country	population	population_change
1	Asia	Afghanistan	39.84	2.33%
2	Europe	Albania	25.90	-0.11%
3	Africa	Algeria	69.40	1.85%
4	Oceania	American Samoa	7.70	-0.22%
5	Europe	Andorra	25.90	0.16%
6	North America	Antigua and Barbuda	85.40	0.84%
7	South America	Argentina	45.81	0.93%
8	Oceania	Australia	25.74	1.18%
9	Europe	Austria	25.90	0.57%
10	Asia	Bahrain	1.75	3.68%
11	Asia	Bangladesh	166.30	1.01%
12	Europe	Belarus	25.90	-0.03%
13	Europe	Belgium	11.59	0.44%
14	North America	Bermuda	85.40	-0.36%
15	South America	Bolivia	92.60	1.39%
16	Europe	Bosnia and Herzegovina	25.90	-0.61%
17	South America	Brazil	213.99	0.72%
18	Asia	Brunei	0.44	0.97%
19	Europe	Bulgaria	25.90	-0.74%
20	Asia	Burma	170.30	0.67%

Showing 1 to 20 of 126 entries, 4 total columns



SHEET 7:

Visualizing total world population filtered by year.

Generating Dataset for sheet 7:

```
write_xlsx(sheet7,"sheet7.xlsx")
sheet7 <- df[,c('continent', 'country', 'population', 'population_change')]
```

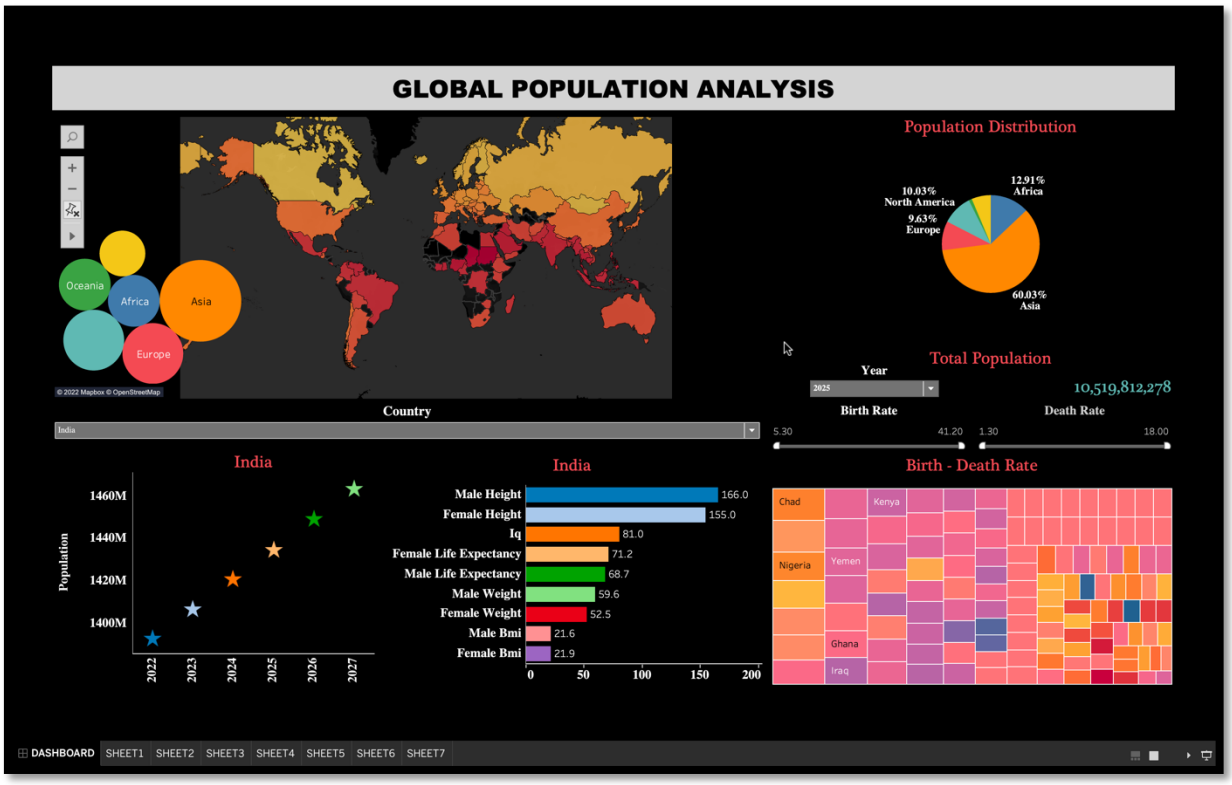
Queries.R* | sheet4 | sheet5 | sheet6 | sheet7 | sheet3 | sheet1 | sheet2

Filter

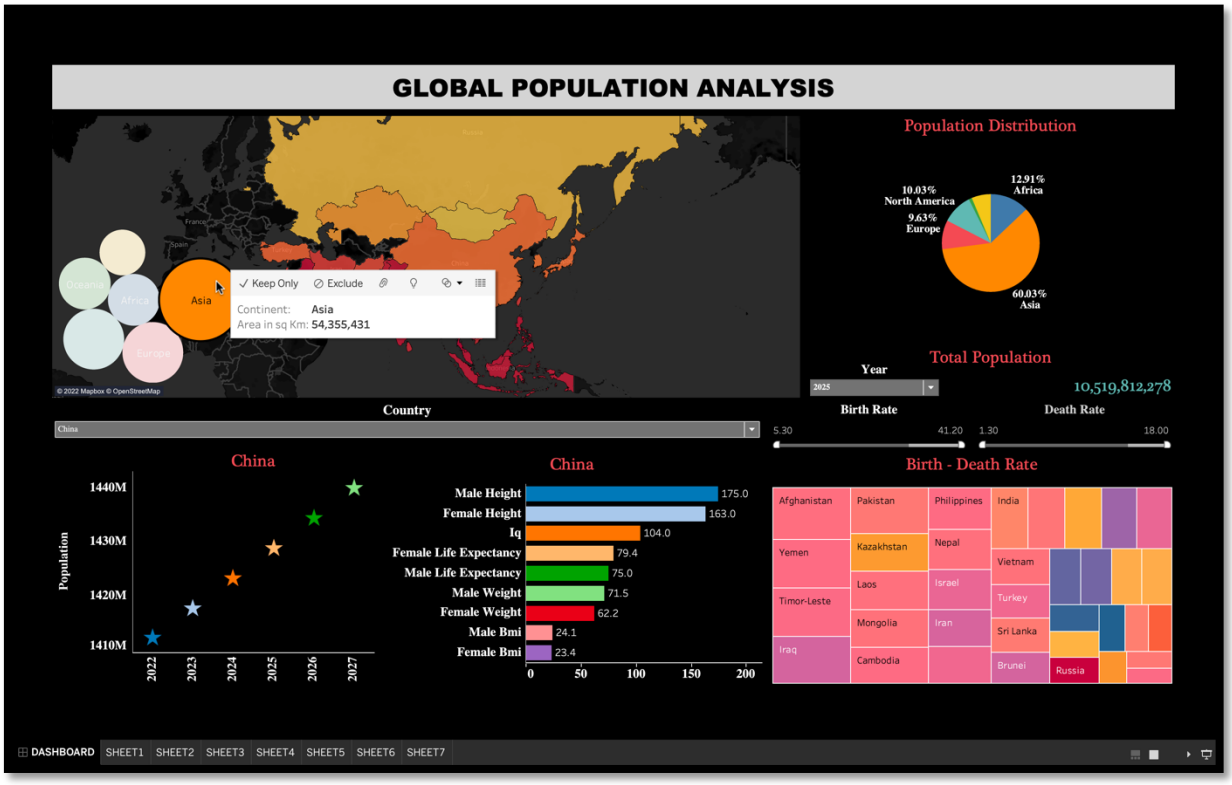
	continent	country	population	population_change
1	Asia	Afghanistan	39.84	2.33%
2	Europe	Albania	25.90	-0.11%
3	Africa	Algeria	69.40	1.85%
4	Oceania	American Samoa	7.70	-0.22%
5	Europe	Andorra	25.90	0.16%
6	North America	Antigua and Barbuda	85.40	0.84%
7	South America	Argentina	45.81	0.93%
8	Oceania	Australia	25.74	1.18%
9	Europe	Austria	25.90	0.57%
10	Asia	Bahrain	1.75	3.68%
11	Asia	Bangladesh	166.30	1.01%
12	Europe	Belarus	25.90	-0.03%
13	Europe	Belgium	11.59	0.44%
14	North America	Bermuda	85.40	-0.36%
15	South America	Bolivia	92.60	1.39%
16	Europe	Bosnia and Herzegovina	25.90	-0.61%
17	South America	Brazil	213.99	0.72%
18	Asia	Brunei	0.44	0.97%
19	Europe	Bulgaria	25.90	-0.74%
20	Asia	Burma	170.30	0.67%

Showing 1 to 20 of 126 entries, 4 total columns

Final Dashboard:



Using Continent as filter:



Using Country as filter: