

# Diasporas, Data, D3.js, *Oh my!*









🖤 Was it all even worth it?



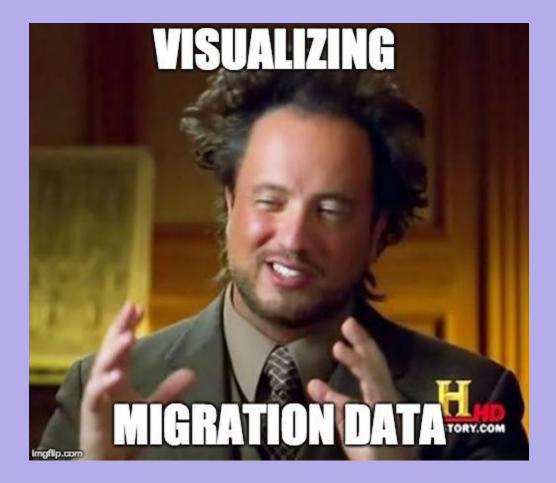


### -1 – What I built

Visualizing the aftermath of a genocide.











### 200 - 300 Million Bengalis in the world

### 32 Million Have migrated out of Bangladesh since 2000









### Running through the UN archives with my woes.

Year	Sort order	Major area, region, country or area of destination	Notes	Code	Type of data (a)	Bangladesh
1990	1990002	More developed regions	b	901		160,805
1990	1990003	Less developed regions	С	902	-	5,290,741
1990	1990004	Least developed countries	d	941		2,047
1990	1990005	Less developed regions, excluding least developed countries		934		5,288,694
1990	1990006	High-income countries	e	1503		1,038,610
1990	1990007	Middle-income countries	e	1517		4,412,312
1990	1990008	Upper-middle-income countries	е	1502		34,282
1990	1990009	Lower-middle-income countries	е	1501		4,378,030
1990	1990010	Low-income countries	e	1500		624
1990	1990011	Sub-Saharan Africa	f	947		2,649
1990	1990012	AFRICA		903	1	3,079
1990	1990013	Eastern Africa		910		More 132



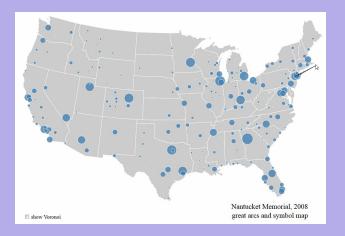


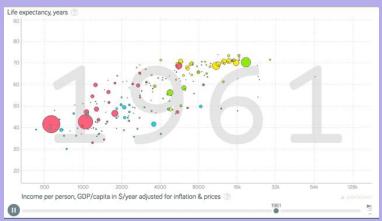
Region, subregion, country or area	Notes	Code	More Developed Regions	132 Less Developed Regions	Least developed countries	High-incom Countries	
French Gulana		254	N	Y	N	N/A	
Guyana		328	N	Y	N	N	
Paraguay		600	N	Y	N	N	
Peru		604	N	Y	N	N	
Suriname		740	N	Y	N	N	
Uruguay		858	N	Y	N	Y	
Venezuela (Bolivarian Republic of)		862	N	Y	N	N	
NORTHERN AMERICA	1	905		1		1	
Bermuda		60	Y	N	N	Y	
Canada		124	Y	N	N	Y	
Greenland		304	Y	N	N	Y	
Saint Pierre and Migueion		666	Y	N	N	N/A	
		840	Y	N	N	Y	
OCEANIA	1	909		1		1	
Australia/New Zealand	1	927		1		1	
Australia	- 24	36	Y	N	N	Y	
New Zealand	1	554	Y	N	N	Y	
	French Gulana Guyana Paraguay Peru Suriname Uruguay Venezuela (Solivarian Republic of) NORTHERN AMERICA Bermuda Canada Canada Greenland Saint Pierre and Miguelon United States of America OCEANIA AustraliaNew Zealand Australia	Paraguay       Paraguay       Paraguay       Paraguay       Paraguay       Paraguay       Venezuela (Soliverien Republic of)       NORTHERN AMERICA       Bermuda       Caraeda       Greenland       Saint Plare and Miquelon       Unide States of America       OCEANIA       Australia/New Zealand       Nortalial       24	910           Region, subregion, country or area         Notes         Code           French Guiana         254         328           Guyana         328         600           Paraguay         600         604           Suriname         740         044           Uruguay         858         604           NORTHERN AMERICA         905         862           NORTHERN AMERICA         905         905           Bormuda         660         606           Canada         314         324           Saint Pierre and Miqueion         666         066           Unitad States of America         840         909           Australia/New Zealand         927         Australia         224           New Zealand         554         554         554	910         More           Region, subregion, country or area         Notes         Code         Developed           French Guiana         254         N           Guyana         328         N           Paraguay         600         N           Paraguay         604         N           Surname         740         N           Uruguay         858         N           Venezuela (Bolivarian Republic of)         862         N           NORTHERN AMERICA         905         905           Bormuda         60         Y           Greenland         304         Y           Saint Pierre and Miqueion         840         Y           OCEANIA         909         4ustralia/New Zealand         927           Australia         24         36         Y	910         132         Less           Region, subregion, country or area         Notes         Code         Developed Regions         Developed Regions           French Guiana         254         N         Y           Guyana         328         N         Y           Paraguay         600         N         Y           Paraguay         604         N         Y           Surmame         740         N         Y           Uruguay         858         N         Y           Venezuela (Boliverian Republic of)         862         N         Y           NORTHERN AMERICA         3905         Surmada         600         Y         N           Generatia         304         Y         N         Surmada         304         Y         N           Greenland         304         Y         N         Surmada         309         N         V         N         OCEANIA         309         N         V         N <t< td=""><td>910         More Developed Region, subregion, country or area         More Notes         More Code         More Developed Regions         Least developed Regions           French Guiana         254         N         Y         N           Guyana         328         N         Y         N           Paraguay         600         N         Y         N           Paraguay         600         N         Y         N           Suriname         740         N         Y         N           Uruguay         858         N         Y         N           Venezuela (Solivarian Republic of)         852         N         Y         N           NORTHERN AMERICA         905        </td></t<>	910         More Developed Region, subregion, country or area         More Notes         More Code         More Developed Regions         Least developed Regions           French Guiana         254         N         Y         N           Guyana         328         N         Y         N           Paraguay         600         N         Y         N           Paraguay         600         N         Y         N           Suriname         740         N         Y         N           Uruguay         858         N         Y         N           Venezuela (Solivarian Republic of)         852         N         Y         N           NORTHERN AMERICA         905	

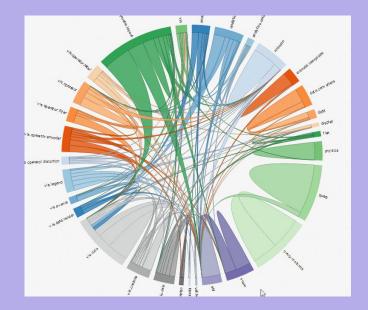
# D3.JS is a great introduction to data visualization.











### EmpireJS 2018

### @thathijabae

AI	B	C	D	E	F	G	H	1	4	A	В	C	D	E	E_	A	В	C	D
				(TAN					1	Year	location	latitude	longitude	num_of_people	1	Mauritius	1990	21	
			3	653					2	1990	Australia	-28.86944	153.04453	2315	2	Seychelles	1990	4	
			1	Ser 19					3	1990	Austria	48.210033	16.363449	1508	3	Uganda	1990	9	
			Uni	ted Nati	ons				4	0.000	Bahrain	26.156258			4	Egypt	1990	89	
Population Division								5		Belgium	51.260197	4.402771		5	Libya	1990	252		
Department of Economic and Social Affairs								6		Bhutan	26.90069			6	Namibia	1990	30		
														0					
Workbook: UN_MigrantStockByOriginAndDestination_2017								7		Bolivia	-17.413977			1	SouthAfrica	1990	1763		
		Table 3. Female migrant stock at mid-year b	by origin and	i by majo	r area, reg	ion, country or	area of destina	ition, 1990-2017	8		BruneiDarus	1		659	8	China	1990	631	
		December 2017	Convright ©	2017 by Ur	ited Mation	s. All rights reserve	-		9	1990	Bulgaria	42.698334	23.319941	22	9	HongKongSA	1990	194	
									10	1990	Canada	-124.01289	48.370846	4203	10	NorthKorea	1990	21	
S	Suggest	ed citation: United Nations, Department of Economic and Social Affairs. Po	opulation Division	n (2017). Tre	nds in Interna	tional Migrant Stock:	The 2017 revision (I	<b>Jnited Nations databas</b>	<sup>se</sup> 11	1990	China	22.210928	113.552971	1858	11	Japan	1990	1075	
									12	1990	HongKongSA	22.28552	114.15769	297	12	SouthKorea	1990	654	
				8		Country or area of	origin		13		CostaRica	9,934739			13	Bhutan	1990	16	
	iort	Major area, region, country or area of destination	Notes	Code	Type of data (a)	Total	Other North	Other South	14		Cyprus	35.095192			14	India	1990	2324893	
					and (a)		ALC: NOT THE REAL PROPERTY OF		15		Czechia	50.598427			15	Maldives	1990	892	
	0001	WORLD		900		75,086,026	1,083,738	3,020,492											
	0002	More developed regions Less developed regions	c	901 902		42,121,221 32,964,805	572,738 511,000	1,585,626	16	(	NorthKorea	37.90889			16	Nepal	1990	43	
	0004	Least developed regions	d	941		5.516.710	109,006	260,135	17		Denmark	55.676098				SriLanka	1990	5	
	0005	Less developed regions, excluding least developed countries		934		27,448,095	401,994	1,174,731	18	1990	Egypt	31.205753	29.924526	112	18	BruneiDarus	1990	593	
	0006	High-income countries	8	1503		36,450,724	560,571	1,734,535	19	1990	ElSalvador	13.90519	-89.500206	11	19	Malaysia	1990	22967	
	0007	Middle-income countries	e	1517		34,222,945 16,462,057	447,988	1,066,306	20	1990	Fiji	-17.713371	178.065033	1368	20	Myanmar	1990	1158	
	0008	Upper-middle-income countries Lower-middle-income countries	6	1502		16,462,057	111,258 336,730	678,326	- 21	1990	Finland	60,165249	24,945831	115	21	Philippines	1990	39	
	0010	Low-income countries	9	1500		4,269,524	69,888	211,569	22	1990	France	48.858093	2.294694			Singapore	1990	5840	
	0011	Sub-Saharan Africa	1	947		6,945,013	124,206	389,831	23		Germany	52.520008			and the second second	Thailand	1990	438	
		AFRICA		903		7,411,059	129,604	403,619	24		Greece	37.98381			24	Timor-Leste	1990	60	
	0013	Eastern Africa Burundi		910 108	BR	2,892,842 169,843	55,171 4,560	143,229 25,839											
	0014	Comoros		174	B	7.362	330	<u>∠0,039</u> 415	25		Hungary	47.497913			25	VietNam	1990	215	
	0016	Djibouti		262	BR	57,979	809	2,428	- 26		India	28.6448			26	Bahrain	1990	18393	
	0017	Entrea		232	1	5,620	166	347	27	1990	Ireland	53.35014	-6.266155	157	27	Cyprus	1990	159	
	0018	Ethiopia		231 404	BR	548,106	3,490	10,472	28	1990	Italy	43.769562	11.255814	5421	28	Jordan	1990	651	
	0019	Kenya Madagascar		404	BR	136,440	16,369 1.570	27,870	29	1990	Japan	35.652832	139.839478	2110	29	Kuwait	1990	109188	
	0021	Malawi	-	454	BR	581,204	7,012	11,255	30	1990	Jordan	31.963158	35,930359	948	30	Lebanon	1990	297	
	0022	Mauritius	1	480	C	1,850	66	160			Kuwait	29.378586		126783	31	Oman	1990	49323	
	0023	Mayotte		175	B	6,449	549	657	- 32		Latvia	56.946285			32	Qatar	1990	33076	
	0024	Mozambique Réunion	-	508 638	8 R 8	56,272 26,486	7,418	20,291 3,326	33		Lebanon	33.88863	35.49548		33	SaudiArabia	1990	357396	
	0025	Rwanda		646	BR	20,466	3, 157 467	9,908											
	0027	Seychelles		690	В	1,517	147	232	34		Libya	32.885353			34	Turkey	1990	73	
	0028	Somalia		706	IR	234,093	2,985	5,969	35		Luxembourg				35	UnitedArabE	1990	139177	
	0029	South Sudan Uganda		728	BR	268,223	210	10.257	36	1990	Malaysia	3.519863	101.538116		36	Bulgaria	1990	18	
1990 1990	0031	United Republic of Tanzania	2	834	BR	290,635	779	1,404	37	1990	Maldives	0.5	73.399658	1623	37	Czechia	1990	7	
1990 1990	0032	Zambia	1	894	BR	136,222	1,283	2,971	38	1000	Malta	35 017073	14 400043	6	28	Hundary	1000	52	-

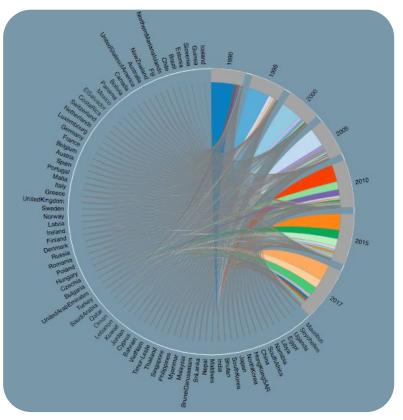




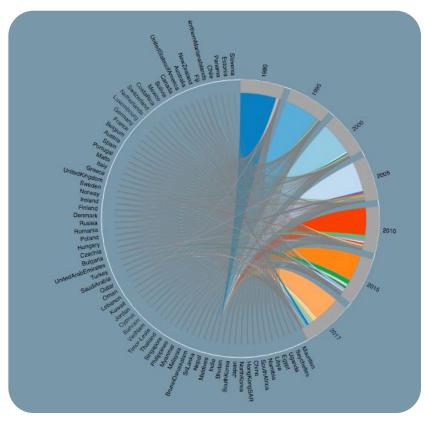




### Persons identified as male:



### Persons identified as female:



### <u>–</u>How I built it –

Let's look at some code.



### ••••

```
var selectedCountry = null;
```

```
var margin = {
   top: 20,
   right: 20,
   bottom: 20,
   left: 20
};
```

```
var width = 1350,
    height = 800;
```

// Map sizing, numbers based on stylistic placement.
var projection = d3.geo.mercator()
 .scale(160)
 .translate([width / 1.9, height / 1.7]);

```
// Enables zoom behavior.
// The scaleExtent range prevents excessive zoomin
var zoom = d3.behavior.zoom()
.scaleExtent([1, 8])
.on("zoom", zoom);
```

```
var path = d3.geo.path()
  .pointRadius(2)
  .projection(projection);
```

### // Draws the map

```
var svg = d3.select(".map")
.append('svg')
.attr('width', width + margin.left + margin.right)
.attr('height', height + margin.top + margin.bottom)
.attr('transform', 'translate(' + margin.left + "," + margin.top + ')')
.call(zoom);
```

// Makes sure that svg elements are bound together
var g = svg.append('g');

### .

```
d3.json(worldMapJson, function(error, countries) {
    d3.json(populationsJson, function(error, populations) {
        let mapG = svg.append("g");
        let map = svg.append("g");
    }
}
```

```
//Map Styles
```

```
mapG.selectAll("path")
    .data(countries.features)
    .enter().append("path")
    .attr("d", path)
    .style("fill","black")
    .style("stroke","white")
    .style("stroke-width","0.1");
let trans = {};
let zoom = d3.zoom()
    .scaleExtent([1, 8])
    .on("zoom", () => {
        trans["stroke-width"] = 1.5 / d3.event.transform.k + "px";
        trans["transform"] = d3.event.transform;
        mapG.style("stroke-width", trans["stroke-width"]);
        mapG.attr("transform", trans["transform"]);
        map.style("stroke-width", trans["stroke-width"]);
        map.attr("transform", trans["transform"]);
svg.call(zoom);
```

### •••

{"type":"FeatureCollection","features":[ {"type":"Feature","properties":{"name":"Afghanistan"},"geometry": {"type":"Polygon","coordinates":[[61.210817,35.650072],[62.230651,35.270664],[62.984662,35.404041], [63.193538,35.857166],[63.982896,36.007957],[64.546479,36.312073],[64.746105,37.111818], [65.588948,37.305217],[65.745631,37.661164],[66.217385,37.39379],[66.518607,37.362784], [67.075782,37.356144],[67.83,37.144994],[68.135562,37.023115],[68.859446,37.344336],[69.196273,37.151144], [69.518785,37.608997],[70.116578,37.588223],[70.270574,37.735165],[70.376304,38.138396], [70.806821,38.486282],[71.348131,38.258905],[71.239404,37.953265],[71.541918,37.905774], [71.448693,37.065645],[71.844638,36.738171],[72.193041,36.948288],[72.63689,37.047558], [73.260056,37.495257],[73.948696,37.421566],[74.980002,37.41999],[75.158028,37.133031], [74.575893,37.020841],[74.067552,36.836176],[72.920025,36.720007],[71.846292,36.509942], [71.262348,36.074388],[71.498768,35.650563],[71.613076,35.153203],[71.115019,34.733126], [71.156773,34.348911],[70.881803,33.988856],[69.930543,34.02012],[70.323594,33.358533], [69.687147,33.105499],[69.262522,32.501944],[69.317764,31.901412],[68.926677,31.620189], [68.556932, 31.71331], [67.792689, 31.58293], [67.683394, 31.303154], [66.938891, 31.304911], [66.381458, 30.738899],[66.346473,29.887943],[65.046862,29.472181],[64.350419,29.560031],[64.148002,29.340819], [63.550261,29.468331],[62.549857,29.318572],[60.874248,29.829239],[61.781222,30.73585], [61.699314,31.379506],[60.941945,31.548075],[60.863655,32.18292],[60.536078,32.981269],[60.9637,33.528832], [60.52843,33.676446],[60.803193,34.404102],[61.210817,35.650072]]]},"id":"AFG"},

### •••

Year, location, latitude, longitude, num\_of\_people 1990, Australia, -28, 86944, 153, 04453, 2315 1995, Australia, -28.86944, 153.04453, 5562 2000, Australia, -28.86944, 153.04453, 8480 2005, Australia, -28.86944, 153.04453, 16130 2010, Australia, -28.86944, 153.04453, 29590 2015, Australia, -28.86944, 153.04453, 37092 2017, Australia, -28, 86944, 153, 04453, 38888 1990, Austria, 48.210033, 16.363449, 1508 1995, Austria, 48.210033, 16.363449, 1701 2000, Austria, 48.210033, 16.363449, 1894 2005, Austria, 48.210033, 16.363449, 2117 2010, Austria, 48.210033, 16.363449, 2340 2015, Austria, 48, 210033, 16, 363449, 2737 2017, Austria, 48.210033, 16.363449, 3013 1990, Bahrain, 26.156258, 50.400505, 20442 1995, Bahrain, 26.156258, 50.400505, 24630 2000, Bahrain, 26.156258, 50.400505, 28889 2005, Bahrain, 26.156258, 50.400505, 49900 2010, Bahrain, 26.156258, 50.400505, 81920 2015, Bahrain, 26.156258, 50.400505, 78396 2017, Bahrain, 26.156258, 50.400505, 80457 1990, Belgium, 51.260197, 4.402771, 268 1995, Belgium, 51.260197, 4.402771, 397 2000, Belgium, 51.260197, 4.402771, 515 2005, Belgium, 51.260197, 4.402771, 781

### .

```
function render(year,cause) {
    map = svg.append("q");
    map.style("stroke-width", trans["stroke-width"]);
   map.attr("transform", trans["transform"]);
    let data = nestD.find(n => +n.kev === vear);
   if(!data) return;
    data = data.values;
    if(cause) {
        data = data.filter(d=>d["location"] === cause);
    for(let i = 0; i < data.length; i ++) {</pre>
        map.append("circle")
            .attr("cx", projection([data[i].longitude, data[i].latitude])[0])
            .attr("cy", projection([data[i].longitude, data[i].latitude])[1])
            .attr("r", (Math.sgrt(data[i]["num of people"]))/15)
            .style("fill", "red");
    let causeArr = causeArr2.find(d => +d.time === year);
```

### 

Year location, latitude, longitude, num\_of\_people 1990, Australia, -28, 86944, 153, 04453, 2315 1995, Australia, -28.86944, 153.04453, 5562 2000, Australia, -28.86944, 153.04453, 8480 2005, Australia, -28.86944, 153.04453, 16130 2010, Australia, -28.86944, 153.04453, 29590 2015, Australia, -28.86944, 153.04453, 37092 2017, Australia, -28, 86944, 153, 04453, 38888 1990, Austria, 48.210033, 16.363449, 1508 1995, Austria, 48.210033, 16.363449, 1701 2000, Austria, 48.210033, 16.363449, 1894 2005, Austria, 48.210033, 16.363449, 2117 2010, Austria, 48.210033, 16.363449, 2340 2015, Austria, 48, 210033, 16, 363449, 2737 2017, Austria, 48.210033, 16.363449, 3013 1990, Bahrain, 26.156258, 50.400505, 20442 1995, Bahrain, 26.156258, 50.400505, 24630 2000, Bahrain, 26.156258, 50.400505, 28889 2005, Bahrain, 26.156258, 50.400505, 49900 2010, Bahrain, 26, 156258, 50, 400505, 81920 2015, Bahrain, 26.156258, 50.400505, 78396 2017, Bahrain, 26.156258, 50.400505, 80457 1990, Belgium, 51.260197, 4.402771, 268 1995, Belgium, 51.260197, 4.402771, 397 2000, Belgium, 51.260197, 4.402771, 515 2005, Belgium, 51.260197, 4.402771, 781

### .....

```
function render(year,cause) {
   map.remove();
   map = svg.append("q");
   map.style("stroke-width", trans["stroke-width"]);
   map.attr("transform", trans["transform"]);
   let data = nestD.find(n => +n.kev === vear);
   if(!data) return;
   data = data.values;
   if(cause) {
       data = data.filter(d=>d["location"] === cause);
   for(let i = 0; i < data.length; i ++) {</pre>
        map.append("circle")
            .attr("cx", projection([data[i].longitude, data[i].latitude])[0])
            .attr("cy", projection([data[i].longitude, data[i].latitude])[1])
            .attr("r", (Math.sgrt(data[i]["num of people"]))/15)
            .style("fill", "red");
    let causeArr = causeArr2.find(d => +d.time === year);
```

### •••

Year, location, latitude, longitude, pum\_of\_people 1990, Australia, -28, 86944, 153, 04453, 2315 1995, Australia, -28.86944, 153.04453, 5562 2000, Australia, -28.86944, 153.04453, 8480 2005, Australia, -28.86944, 153.04453, 16130 2010, Australia, -28.86944, 153.04453, 29590 2015, Australia, -28.86944, 153.04453, 37092 2017, Australia, -28, 86944, 153, 04453, 38888 1990, Austria, 48.210033, 16.363449, 1508 1995, Austria, 48.210033, 16.363449, 1701 2000, Austria, 48.210033, 16.363449, 1894 2005, Austria, 48.210033, 16.363449, 2117 2010, Austria, 48.210033, 16.363449, 2340 2015, Austria, 48, 210033, 16, 363449, 2737 2017, Austria, 48.210033, 16.363449, 3013 1990, Bahrain, 26.156258, 50.400505, 20442 1995, Bahrain, 26.156258, 50.400505, 24630 2000, Bahrain, 26.156258, 50.400505, 28889 2005, Bahrain, 26.156258, 50.400505, 49900 2010, Bahrain, 26.156258, 50.400505, 81920 2015, Bahrain, 26.156258, 50.400505, 78396 2017, Bahrain, 26.156258, 50.400505, 80457 1990, Belgium, 51.260197, 4.402771, 268 1995, Belgium, 51.260197, 4.402771, 397 2000, Belgium, 51.260197, 4.402771, 515 2005, Belgium, 51.260197, 4.402771, 781

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Year, location, latitude, longitude, num\_of\_people 1990, Australia, -28, 86944, 153, 04453, 2315 1995, Australia, -28.86944, 153.04453, 5562 2000, Australia, -28.86944, 153.04453, 8480 2005, Australia, -28.86944, 153.04453, 16130 2010, Australia, -28.86944, 153.04453, 29590 2015, Australia, -28.86944, 153.04453, 37092 2017, Australia, -28, 86944, 153, 04453, 38888 1990, Austria, 48.210033, 16.363449, 1508 1995, Austria, 48.210033, 16.363449, 1701 2000, Austria, 48.210033, 16.363449, 1894 2005, Austria, 48.210033, 16.363449, 2117 2010, Austria, 48.210033, 16.363449, 2340 2015, Austria, 48, 210033, 16, 363449, 2737 2017, Austria, 48.210033, 16.363449, 3013 1990, Bahrain, 26.156258, 50.400505, 20442 1995, Bahrain, 26.156258, 50.400505, 24630 2000, Bahrain, 26.156258, 50.400505, 28889 2005, Bahrain, 26.156258, 50.400505, 49900 2010, Bahrain, 26.156258, 50.400505, 81920 2015, Bahrain, 26.156258, 50.400505, 78396 2017, Bahrain, 26.156258, 50.400505, 80457 1990, Belgium, 51.260197, 4.402771, 268 1995, Belgium, 51.260197, 4.402771, 397 2000, Belgium, 51.260197, 4.402771, 515 2005, Belgium, 51.260197, 4.402771, 781

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## Why did I <sup>3</sup>-build this?

Existential Crisis Time!







N. R. Narayana Murthy:

Engineering or technology is all about using the power of science to make life better for people, to reduce cost, to improve comfort, to improve productivity, etc.



### **Does it even matter?**







noun | di·as·po·ra | \ dī-'as-p(ə-)rə , dē- \

the movement, migration, or scattering of a people away from an established or ancestral homeland

or

any group migration or flight from a country or region.





### Data is always collected with an agenda.

# I wanted to make my father's memories of war concrete with some hard numbers.



# With great power comes great responsibility.





## Thank you!

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