

# diabetes.R

Trishala

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```
my_data <- read.csv("C:/Users/Trishala/Desktop/diabetes.csv")
summary(my_data)
```

##	Pregnancies	Glucose	BloodPressure	SkinThickness
##	Min. : 0.000	Min. : 0.0	Min. : 0.00	Min. : 0.00
##	1st Qu.: 1.000	1st Qu.: 99.0	1st Qu.: 62.00	1st Qu.: 0.00
##	Median : 3.000	Median :117.0	Median : 72.00	Median :23.00
##	Mean : 3.845	Mean :120.9	Mean : 69.11	Mean :20.54
##	3rd Qu.: 6.000	3rd Qu.:140.2	3rd Qu.: 80.00	3rd Qu.:32.00
##	Max. :17.000	Max. :199.0	Max. :122.00	Max. :99.00
##	Insulin	BMI	DiabetesPedigreeFunction	Age
##	Min. : 0.0	Min. : 0.00	Min. :0.0780	Min. :21.00
##	1st Qu.: 0.0	1st Qu.:27.30	1st Qu.:0.2437	1st Qu.:24.00
##	Median : 30.5	Median :32.00	Median :0.3725	Median :29.00
##	Mean : 79.8	Mean :31.99	Mean :0.4719	Mean :33.24
##	3rd Qu.:127.2	3rd Qu.:36.60	3rd Qu.:0.6262	3rd Qu.:41.00
##	Max. :846.0	Max. :67.10	Max. :2.4200	Max. :81.00
##	Outcome			
##	Min. :0.000			
##	1st Qu.:0.000			
##	Median :0.000			
##	Mean :0.349			
##	3rd Qu.:1.000			
##	Max. :1.000			

```
#columns
#PregnanciesNumber of times pregnant
#GlucosePlasma glucose concentration a 2 hours in an oral glucose tolerance test
#BloodPressureDiastolic blood pressure (mm Hg)
#SkinThicknessTriceps skin fold thickness (mm)
#Insulin2-Hour serum insulin (mu U/ml)
#BMIBody mass index (weight in kg/(height in m)^2)
#DiabetesPedigreeFunctionDiabetes pedigree function
#AgeAge (years)
#OutcomeClass variable (0 or 1) 268 of 768 are 1, the others are 0
head(my_data)
```

##	Pregnancies	Glucose	BloodPressure	SkinThickness	Insulin	BMI
## 1	6	148	72	35	0	33.6
## 2	1	85	66	29	0	26.6
## 3	8	183	64	0	0	23.3
## 4	1	89	66	23	94	28.1
## 5	0	137	40	35	168	43.1
## 6	5	116	74	0	0	25.6
##	DiabetesPedigreeFunction	Age	Outcome			
## 1	0.627	50	1			
## 2	0.351	31	0			
## 3	0.672	32	1			
## 4	0.167	21	0			
## 5	2.288	33	1			
## 6	0.201	30	0			

```
structure(my_data)
```

##	Pregnancies	Glucose	BloodPressure	SkinThickness	Insulin	BMI
## 1	6	148	72	35	0	33.6
## 2	1	85	66	29	0	26.6
## 3	8	183	64	0	0	23.3
## 4	1	89	66	23	94	28.1
## 5	0	137	40	35	168	43.1
## 6	5	116	74	0	0	25.6
## 7	3	78	50	32	88	31.0
## 8	10	115	0	0	0	35.3

## 9	2	197	70	45	543 30.5
## 10	8	125	96	0	0 0.0
## 11	4	110	92	0	0 37.6
## 12	10	168	74	0	0 38.0
## 13	10	139	80	0	0 27.1
## 14	1	189	60	23	846 30.1
## 15	5	166	72	19	175 25.8
## 16	7	100	0	0	0 30.0
## 17	0	118	84	47	230 45.8
## 18	7	107	74	0	0 29.6
## 19	1	103	30	38	83 43.3
## 20	1	115	70	30	96 34.6
## 21	3	126	88	41	235 39.3
## 22	8	99	84	0	0 35.4
## 23	7	196	90	0	0 39.8
## 24	9	119	80	35	0 29.0
## 25	11	143	94	33	146 36.6
## 26	10	125	70	26	115 31.1
## 27	7	147	76	0	0 39.4
## 28	1	97	66	15	140 23.2
## 29	13	145	82	19	110 22.2
## 30	5	117	92	0	0 34.1
## 31	5	109	75	26	0 36.0
## 32	3	158	76	36	245 31.6
## 33	3	88	58	11	54 24.8
## 34	6	92	92	0	0 19.9
## 35	10	122	78	31	0 27.6
## 36	4	103	60	33	192 24.0
## 37	11	138	76	0	0 33.2
## 38	9	102	76	37	0 32.9
## 39	2	90	68	42	0 38.2
## 40	4	111	72	47	207 37.1
## 41	3	180	64	25	70 34.0
## 42	7	133	84	0	0 40.2
## 43	7	106	92	18	0 22.7
## 44	9	171	110	24	240 45.4
## 45	7	159	64	0	0 27.4
## 46	0	180	66	39	0 42.0
## 47	1	146	56	0	0 29.7
## 48	2	71	70	27	0 28.0
## 49	7	103	66	32	0 39.1
## 50	7	105	0	0	0 0.0
## 51	1	103	80	11	82 19.4
## 52	1	101	50	15	36 24.2
## 53	5	88	66	21	23 24.4
## 54	8	176	90	34	300 33.7
## 55	7	150	66	42	342 34.7
## 56	1	73	50	10	0 23.0
## 57	7	187	68	39	304 37.7
## 58	0	100	88	60	110 46.8
## 59	0	146	82	0	0 40.5
## 60	0	105	64	41	142 41.5
## 61	2	84	0	0	0 0.0
## 62	8	133	72	0	0 32.9
## 63	5	44	62	0	0 25.0
## 64	2	141	58	34	128 25.4
## 65	7	114	66	0	0 32.8
## 66	5	99	74	27	0 29.0
## 67	0	109	88	30	0 32.5
## 68	2	109	92	0	0 42.7
## 69	1	95	66	13	38 19.6
## 70	4	146	85	27	100 28.9
## 71	2	100	66	20	90 32.9
## 72	5	139	64	35	140 28.6
## 73	13	126	90	0	0 43.4
## 74	4	129	86	20	270 35.1
## 75	1	79	75	30	0 32.0
## 76	1	0	48	20	0 24.7
## 77	7	62	78	0	0 32.6
## 78	5	95	72	33	0 37.7
## 79	0	131	0	0	0 43.2
## 80	2	112	66	22	0 25.0
## 81	3	113	66	13	0 23.4

## 81	3	113	44	13	0 22.4
## 82	2	74	0	0	0 0.0
## 83	7	83	78	26	71 29.3
## 84	0	101	65	28	0 24.6
## 85	5	137	108	0	0 48.8
## 86	2	110	74	29	125 32.4
## 87	13	106	72	54	0 36.6
## 88	2	100	68	25	71 38.5
## 89	15	136	70	32	110 37.1
## 90	1	107	68	19	0 26.5
## 91	1	80	55	0	0 19.1
## 92	4	123	80	15	176 32.0
## 93	7	81	78	40	48 46.7
## 94	4	134	72	0	0 23.8
## 95	2	142	82	18	64 24.7
## 96	6	144	72	27	228 33.9
## 97	2	92	62	28	0 31.6
## 98	1	71	48	18	76 20.4
## 99	6	93	50	30	64 28.7
## 100	1	122	90	51	220 49.7
## 101	1	163	72	0	0 39.0
## 102	1	151	60	0	0 26.1
## 103	0	125	96	0	0 22.5
## 104	1	81	72	18	40 26.6
## 105	2	85	65	0	0 39.6
## 106	1	126	56	29	152 28.7
## 107	1	96	122	0	0 22.4
## 108	4	144	58	28	140 29.5
## 109	3	83	58	31	18 34.3
## 110	0	95	85	25	36 37.4
## 111	3	171	72	33	135 33.3
## 112	8	155	62	26	495 34.0
## 113	1	89	76	34	37 31.2
## 114	4	76	62	0	0 34.0
## 115	7	160	54	32	175 30.5
## 116	4	146	92	0	0 31.2
## 117	5	124	74	0	0 34.0
## 118	5	78	48	0	0 33.7
## 119	4	97	60	23	0 28.2
## 120	4	99	76	15	51 23.2
## 121	0	162	76	56	100 53.2
## 122	6	111	64	39	0 34.2
## 123	2	107	74	30	100 33.6
## 124	5	132	80	0	0 26.8
## 125	0	113	76	0	0 33.3
## 126	1	88	30	42	99 55.0
## 127	3	120	70	30	135 42.9
## 128	1	118	58	36	94 33.3
## 129	1	117	88	24	145 34.5
## 130	0	105	84	0	0 27.9
## 131	4	173	70	14	168 29.7
## 132	9	122	56	0	0 33.3
## 133	3	170	64	37	225 34.5
## 134	8	84	74	31	0 38.3
## 135	2	96	68	13	49 21.1
## 136	2	125	60	20	140 33.8
## 137	0	100	70	26	50 30.8
## 138	0	93	60	25	92 28.7
## 139	0	129	80	0	0 31.2
## 140	5	105	72	29	325 36.9
## 141	3	128	78	0	0 21.1
## 142	5	106	82	30	0 39.5
## 143	2	108	52	26	63 32.5
## 144	10	108	66	0	0 32.4
## 145	4	154	62	31	284 32.8
## 146	0	102	75	23	0 0.0
## 147	9	57	80	37	0 32.8
## 148	2	106	64	35	119 30.5
## 149	5	147	78	0	0 33.7
## 150	2	90	70	17	0 27.3
## 151	1	136	74	50	204 37.4
## 152	4	114	65	0	0 21.9
## 153	9	156	86	28	155 34.3

## 154	1	153	82	42	485 40.6
## 155	8	188	78	0	0 47.9
## 156	7	152	88	44	0 50.0
## 157	2	99	52	15	94 24.6
## 158	1	109	56	21	135 25.2
## 159	2	88	74	19	53 29.0
## 160	17	163	72	41	114 40.9
## 161	4	151	90	38	0 29.7
## 162	7	102	74	40	105 37.2
## 163	0	114	80	34	285 44.2
## 164	2	100	64	23	0 29.7
## 165	0	131	88	0	0 31.6
## 166	6	104	74	18	156 29.9
## 167	3	148	66	25	0 32.5
## 168	4	120	68	0	0 29.6
## 169	4	110	66	0	0 31.9
## 170	3	111	90	12	78 28.4
## 171	6	102	82	0	0 30.8
## 172	6	134	70	23	130 35.4
## 173	2	87	0	23	0 28.9
## 174	1	79	60	42	48 43.5
## 175	2	75	64	24	55 29.7
## 176	8	179	72	42	130 32.7
## 177	6	85	78	0	0 31.2
## 178	0	129	110	46	130 67.1
## 179	5	143	78	0	0 45.0
## 180	5	130	82	0	0 39.1
## 181	6	87	80	0	0 23.2
## 182	0	119	64	18	92 34.9
## 183	1	0	74	20	23 27.7
## 184	5	73	60	0	0 26.8
## 185	4	141	74	0	0 27.6
## 186	7	194	68	28	0 35.9
## 187	8	181	68	36	495 30.1
## 188	1	128	98	41	58 32.0
## 189	8	109	76	39	114 27.9
## 190	5	139	80	35	160 31.6
## 191	3	111	62	0	0 22.6
## 192	9	123	70	44	94 33.1
## 193	7	159	66	0	0 30.4
## 194	11	135	0	0	0 52.3
## 195	8	85	55	20	0 24.4
## 196	5	158	84	41	210 39.4
## 197	1	105	58	0	0 24.3
## 198	3	107	62	13	48 22.9
## 199	4	109	64	44	99 34.8
## 200	4	148	60	27	318 30.9
## 201	0	113	80	16	0 31.0
## 202	1	138	82	0	0 40.1
## 203	0	108	68	20	0 27.3
## 204	2	99	70	16	44 20.4
## 205	6	103	72	32	190 37.7
## 206	5	111	72	28	0 23.9
## 207	8	196	76	29	280 37.5
## 208	5	162	104	0	0 37.7
## 209	1	96	64	27	87 33.2
## 210	7	184	84	33	0 35.5
## 211	2	81	60	22	0 27.7
## 212	0	147	85	54	0 42.8
## 213	7	179	95	31	0 34.2
## 214	0	140	65	26	130 42.6
## 215	9	112	82	32	175 34.2
## 216	12	151	70	40	271 41.8
## 217	5	109	62	41	129 35.8
## 218	6	125	68	30	120 30.0
## 219	5	85	74	22	0 29.0
## 220	5	112	66	0	0 37.8
## 221	0	177	60	29	478 34.6
## 222	2	158	90	0	0 31.6
## 223	7	119	0	0	0 25.2
## 224	7	142	60	33	190 28.8
## 225	1	100	66	15	56 23.6
## 226	1	87	78	27	32 34.6

## 227	0	101	76	0	0 35.7
## 228	3	162	52	38	0 37.2
## 229	4	197	70	39	744 36.7
## 230	0	117	80	31	53 45.2
## 231	4	142	86	0	0 44.0
## 232	6	134	80	37	370 46.2
## 233	1	79	80	25	37 25.4
## 234	4	122	68	0	0 35.0
## 235	3	74	68	28	45 29.7
## 236	4	171	72	0	0 43.6
## 237	7	181	84	21	192 35.9
## 238	0	179	90	27	0 44.1
## 239	9	164	84	21	0 30.8
## 240	0	104	76	0	0 18.4
## 241	1	91	64	24	0 29.2
## 242	4	91	70	32	88 33.1
## 243	3	139	54	0	0 25.6
## 244	6	119	50	22	176 27.1
## 245	2	146	76	35	194 38.2
## 246	9	184	85	15	0 30.0
## 247	10	122	68	0	0 31.2
## 248	0	165	90	33	680 52.3
## 249	9	124	70	33	402 35.4
## 250	1	111	86	19	0 30.1
## 251	9	106	52	0	0 31.2
## 252	2	129	84	0	0 28.0
## 253	2	90	80	14	55 24.4
## 254	0	86	68	32	0 35.8
## 255	12	92	62	7	258 27.6
## 256	1	113	64	35	0 33.6
## 257	3	111	56	39	0 30.1
## 258	2	114	68	22	0 28.7
## 259	1	193	50	16	375 25.9
## 260	11	155	76	28	150 33.3
## 261	3	191	68	15	130 30.9
## 262	3	141	0	0	0 30.0
## 263	4	95	70	32	0 32.1
## 264	3	142	80	15	0 32.4
## 265	4	123	62	0	0 32.0
## 266	5	96	74	18	67 33.6
## 267	0	138	0	0	0 36.3
## 268	2	128	64	42	0 40.0
## 269	0	102	52	0	0 25.1
## 270	2	146	0	0	0 27.5
## 271	10	101	86	37	0 45.6
## 272	2	108	62	32	56 25.2
## 273	3	122	78	0	0 23.0
## 274	1	71	78	50	45 33.2
## 275	13	106	70	0	0 34.2
## 276	2	100	70	52	57 40.5
## 277	7	106	60	24	0 26.5
## 278	0	104	64	23	116 27.8
## 279	5	114	74	0	0 24.9
## 280	2	108	62	10	278 25.3
## 281	0	146	70	0	0 37.9
## 282	10	129	76	28	122 35.9
## 283	7	133	88	15	155 32.4
## 284	7	161	86	0	0 30.4
## 285	2	108	80	0	0 27.0
## 286	7	136	74	26	135 26.0
## 287	5	155	84	44	545 38.7
## 288	1	119	86	39	220 45.6
## 289	4	96	56	17	49 20.8
## 290	5	108	72	43	75 36.1
## 291	0	78	88	29	40 36.9
## 292	0	107	62	30	74 36.6
## 293	2	128	78	37	182 43.3
## 294	1	128	48	45	194 40.5
## 295	0	161	50	0	0 21.9
## 296	6	151	62	31	120 35.5
## 297	2	146	70	38	360 28.0
## 298	0	126	84	29	215 30.7
## 299	14	100	70	25	104 36.6

## 299	14	100	78	25	184 30.0
## 300	8	112	72	0	0 23.6
## 301	0	167	0	0	0 32.3
## 302	2	144	58	33	135 31.6
## 303	5	77	82	41	42 35.8
## 304	5	115	98	0	0 52.9
## 305	3	150	76	0	0 21.0
## 306	2	120	76	37	105 39.7
## 307	10	161	68	23	132 25.5
## 308	0	137	68	14	148 24.8
## 309	0	128	68	19	180 30.5
## 310	2	124	68	28	205 32.9
## 311	6	80	66	30	0 26.2
## 312	0	106	70	37	148 39.4
## 313	2	155	74	17	96 26.6
## 314	3	113	50	10	85 29.5
## 315	7	109	80	31	0 35.9
## 316	2	112	68	22	94 34.1
## 317	3	99	80	11	64 19.3
## 318	3	182	74	0	0 30.5
## 319	3	115	66	39	140 38.1
## 320	6	194	78	0	0 23.5
## 321	4	129	60	12	231 27.5
## 322	3	112	74	30	0 31.6
## 323	0	124	70	20	0 27.4
## 324	13	152	90	33	29 26.8
## 325	2	112	75	32	0 35.7
## 326	1	157	72	21	168 25.6
## 327	1	122	64	32	156 35.1
## 328	10	179	70	0	0 35.1
## 329	2	102	86	36	120 45.5
## 330	6	105	70	32	68 30.8
## 331	8	118	72	19	0 23.1
## 332	2	87	58	16	52 32.7
## 333	1	180	0	0	0 43.3
## 334	12	106	80	0	0 23.6
## 335	1	95	60	18	58 23.9
## 336	0	165	76	43	255 47.9
## 337	0	117	0	0	0 33.8
## 338	5	115	76	0	0 31.2
## 339	9	152	78	34	171 34.2
## 340	7	178	84	0	0 39.9
## 341	1	130	70	13	105 25.9
## 342	1	95	74	21	73 25.9
## 343	1	0	68	35	0 32.0
## 344	5	122	86	0	0 34.7
## 345	8	95	72	0	0 36.8
## 346	8	126	88	36	108 38.5
## 347	1	139	46	19	83 28.7
## 348	3	116	0	0	0 23.5
## 349	3	99	62	19	74 21.8
## 350	5	0	80	32	0 41.0
## 351	4	92	80	0	0 42.2
## 352	4	137	84	0	0 31.2
## 353	3	61	82	28	0 34.4
## 354	1	90	62	12	43 27.2
## 355	3	90	78	0	0 42.7
## 356	9	165	88	0	0 30.4
## 357	1	125	50	40	167 33.3
## 358	13	129	0	30	0 39.9
## 359	12	88	74	40	54 35.3
## 360	1	196	76	36	249 36.5
## 361	5	189	64	33	325 31.2
## 362	5	158	70	0	0 29.8
## 363	5	103	108	37	0 39.2
## 364	4	146	78	0	0 38.5
## 365	4	147	74	25	293 34.9
## 366	5	99	54	28	83 34.0
## 367	6	124	72	0	0 27.6
## 368	0	101	64	17	0 21.0
## 369	3	81	86	16	66 27.5
## 370	1	133	102	28	140 32.8
## 371	3	173	82	48	465 38.4

## 372	0	118	64	23	89 0.0
## 373	0	84	64	22	66 35.8
## 374	2	105	58	40	94 34.9
## 375	2	122	52	43	158 36.2
## 376	12	140	82	43	325 39.2
## 377	0	98	82	15	84 25.2
## 378	1	87	60	37	75 37.2
## 379	4	156	75	0	0 48.3
## 380	0	93	100	39	72 43.4
## 381	1	107	72	30	82 30.8
## 382	0	105	68	22	0 20.0
## 383	1	109	60	8	182 25.4
## 384	1	90	62	18	59 25.1
## 385	1	125	70	24	110 24.3
## 386	1	119	54	13	50 22.3
## 387	5	116	74	29	0 32.3
## 388	8	105	100	36	0 43.3
## 389	5	144	82	26	285 32.0
## 390	3	100	68	23	81 31.6
## 391	1	100	66	29	196 32.0
## 392	5	166	76	0	0 45.7
## 393	1	131	64	14	415 23.7
## 394	4	116	72	12	87 22.1
## 395	4	158	78	0	0 32.9
## 396	2	127	58	24	275 27.7
## 397	3	96	56	34	115 24.7
## 398	0	131	66	40	0 34.3
## 399	3	82	70	0	0 21.1
## 400	3	193	70	31	0 34.9
## 401	4	95	64	0	0 32.0
## 402	6	137	61	0	0 24.2
## 403	5	136	84	41	88 35.0
## 404	9	72	78	25	0 31.6
## 405	5	168	64	0	0 32.9
## 406	2	123	48	32	165 42.1
## 407	4	115	72	0	0 28.9
## 408	0	101	62	0	0 21.9
## 409	8	197	74	0	0 25.9
## 410	1	172	68	49	579 42.4
## 411	6	102	90	39	0 35.7
## 412	1	112	72	30	176 34.4
## 413	1	143	84	23	310 42.4
## 414	1	143	74	22	61 26.2
## 415	0	138	60	35	167 34.6
## 416	3	173	84	33	474 35.7
## 417	1	97	68	21	0 27.2
## 418	4	144	82	32	0 38.5
## 419	1	83	68	0	0 18.2
## 420	3	129	64	29	115 26.4
## 421	1	119	88	41	170 45.3
## 422	2	94	68	18	76 26.0
## 423	0	102	64	46	78 40.6
## 424	2	115	64	22	0 30.8
## 425	8	151	78	32	210 42.9
## 426	4	184	78	39	277 37.0
## 427	0	94	0	0	0 0.0
## 428	1	181	64	30	180 34.1
## 429	0	135	94	46	145 40.6
## 430	1	95	82	25	180 35.0
## 431	2	99	0	0	0 22.2
## 432	3	89	74	16	85 30.4
## 433	1	80	74	11	60 30.0
## 434	2	139	75	0	0 25.6
## 435	1	90	68	8	0 24.5
## 436	0	141	0	0	0 42.4
## 437	12	140	85	33	0 37.4
## 438	5	147	75	0	0 29.9
## 439	1	97	70	15	0 18.2
## 440	6	107	88	0	0 36.8
## 441	0	189	104	25	0 34.3
## 442	2	83	66	23	50 32.2
## 443	4	117	64	27	120 33.2
## 444	8	108	70	0	0 30.5

## 445	4	117	62	12	0 29.7
## 446	0	180	78	63	14 59.4
## 447	1	100	72	12	70 25.3
## 448	0	95	80	45	92 36.5
## 449	0	104	64	37	64 33.6
## 450	0	120	74	18	63 30.5
## 451	1	82	64	13	95 21.2
## 452	2	134	70	0	0 28.9
## 453	0	91	68	32	210 39.9
## 454	2	119	0	0	0 19.6
## 455	2	100	54	28	105 37.8
## 456	14	175	62	30	0 33.6
## 457	1	135	54	0	0 26.7
## 458	5	86	68	28	71 30.2
## 459	10	148	84	48	237 37.6
## 460	9	134	74	33	60 25.9
## 461	9	120	72	22	56 20.8
## 462	1	71	62	0	0 21.8
## 463	8	74	70	40	49 35.3
## 464	5	88	78	30	0 27.6
## 465	10	115	98	0	0 24.0
## 466	0	124	56	13	105 21.8
## 467	0	74	52	10	36 27.8
## 468	0	97	64	36	100 36.8
## 469	8	120	0	0	0 30.0
## 470	6	154	78	41	140 46.1
## 471	1	144	82	40	0 41.3
## 472	0	137	70	38	0 33.2
## 473	0	119	66	27	0 38.8
## 474	7	136	90	0	0 29.9
## 475	4	114	64	0	0 28.9
## 476	0	137	84	27	0 27.3
## 477	2	105	80	45	191 33.7
## 478	7	114	76	17	110 23.8
## 479	8	126	74	38	75 25.9
## 480	4	132	86	31	0 28.0
## 481	3	158	70	30	328 35.5
## 482	0	123	88	37	0 35.2
## 483	4	85	58	22	49 27.8
## 484	0	84	82	31	125 38.2
## 485	0	145	0	0	0 44.2
## 486	0	135	68	42	250 42.3
## 487	1	139	62	41	480 40.7
## 488	0	173	78	32	265 46.5
## 489	4	99	72	17	0 25.6
## 490	8	194	80	0	0 26.1
## 491	2	83	65	28	66 36.8
## 492	2	89	90	30	0 33.5
## 493	4	99	68	38	0 32.8
## 494	4	125	70	18	122 28.9
## 495	3	80	0	0	0 0.0
## 496	6	166	74	0	0 26.6
## 497	5	110	68	0	0 26.0
## 498	2	81	72	15	76 30.1
## 499	7	195	70	33	145 25.1
## 500	6	154	74	32	193 29.3
## 501	2	117	90	19	71 25.2
## 502	3	84	72	32	0 37.2
## 503	6	0	68	41	0 39.0
## 504	7	94	64	25	79 33.3
## 505	3	96	78	39	0 37.3
## 506	10	75	82	0	0 33.3
## 507	0	180	90	26	90 36.5
## 508	1	130	60	23	170 28.6
## 509	2	84	50	23	76 30.4
## 510	8	120	78	0	0 25.0
## 511	12	84	72	31	0 29.7
## 512	0	139	62	17	210 22.1
## 513	9	91	68	0	0 24.2
## 514	2	91	62	0	0 27.3
## 515	3	99	54	19	86 25.6
## 516	3	163	70	18	105 31.6
## 517	0	145	88	24	165 30.2



## 517	9	145	88	34	105 30.5
## 518	7	125	86	0	0 37.6
## 519	13	76	60	0	0 32.8
## 520	6	129	90	7	326 19.6
## 521	2	68	70	32	66 25.0
## 522	3	124	80	33	130 33.2
## 523	6	114	0	0	0 0.0
## 524	9	130	70	0	0 34.2
## 525	3	125	58	0	0 31.6
## 526	3	87	60	18	0 21.8
## 527	1	97	64	19	82 18.2
## 528	3	116	74	15	105 26.3
## 529	0	117	66	31	188 30.8
## 530	0	111	65	0	0 24.6
## 531	2	122	60	18	106 29.8
## 532	0	107	76	0	0 45.3
## 533	1	86	66	52	65 41.3
## 534	6	91	0	0	0 29.8
## 535	1	77	56	30	56 33.3
## 536	4	132	0	0	0 32.9
## 537	0	105	90	0	0 29.6
## 538	0	57	60	0	0 21.7
## 539	0	127	80	37	210 36.3
## 540	3	129	92	49	155 36.4
## 541	8	100	74	40	215 39.4
## 542	3	128	72	25	190 32.4
## 543	10	90	85	32	0 34.9
## 544	4	84	90	23	56 39.5
## 545	1	88	78	29	76 32.0
## 546	8	186	90	35	225 34.5
## 547	5	187	76	27	207 43.6
## 548	4	131	68	21	166 33.1
## 549	1	164	82	43	67 32.8
## 550	4	189	110	31	0 28.5
## 551	1	116	70	28	0 27.4
## 552	3	84	68	30	106 31.9
## 553	6	114	88	0	0 27.8
## 554	1	88	62	24	44 29.9
## 555	1	84	64	23	115 36.9
## 556	7	124	70	33	215 25.5
## 557	1	97	70	40	0 38.1
## 558	8	110	76	0	0 27.8
## 559	11	103	68	40	0 46.2
## 560	11	85	74	0	0 30.1
## 561	6	125	76	0	0 33.8
## 562	0	198	66	32	274 41.3
## 563	1	87	68	34	77 37.6
## 564	6	99	60	19	54 26.9
## 565	0	91	80	0	0 32.4
## 566	2	95	54	14	88 26.1
## 567	1	99	72	30	18 38.6
## 568	6	92	62	32	126 32.0
## 569	4	154	72	29	126 31.3
## 570	0	121	66	30	165 34.3
## 571	3	78	70	0	0 32.5
## 572	2	130	96	0	0 22.6
## 573	3	111	58	31	44 29.5
## 574	2	98	60	17	120 34.7
## 575	1	143	86	30	330 30.1
## 576	1	119	44	47	63 35.5
## 577	6	108	44	20	130 24.0
## 578	2	118	80	0	0 42.9
## 579	10	133	68	0	0 27.0
## 580	2	197	70	99	0 34.7
## 581	0	151	90	46	0 42.1
## 582	6	109	60	27	0 25.0
## 583	12	121	78	17	0 26.5
## 584	8	100	76	0	0 38.7
## 585	8	124	76	24	600 28.7
## 586	1	93	56	11	0 22.5
## 587	8	143	66	0	0 34.9
## 588	6	103	66	0	0 24.3
## 589	3	176	86	27	156 33.3

## 590	0	73	0	0	0 21.1
## 591	11	111	84	40	0 46.8
## 592	2	112	78	50	140 39.4
## 593	3	132	80	0	0 34.4
## 594	2	82	52	22	115 28.5
## 595	6	123	72	45	230 33.6
## 596	0	188	82	14	185 32.0
## 597	0	67	76	0	0 45.3
## 598	1	89	24	19	25 27.8
## 599	1	173	74	0	0 36.8
## 600	1	109	38	18	120 23.1
## 601	1	108	88	19	0 27.1
## 602	6	96	0	0	0 23.7
## 603	1	124	74	36	0 27.8
## 604	7	150	78	29	126 35.2
## 605	4	183	0	0	0 28.4
## 606	1	124	60	32	0 35.8
## 607	1	181	78	42	293 40.0
## 608	1	92	62	25	41 19.5
## 609	0	152	82	39	272 41.5
## 610	1	111	62	13	182 24.0
## 611	3	106	54	21	158 30.9
## 612	3	174	58	22	194 32.9
## 613	7	168	88	42	321 38.2
## 614	6	105	80	28	0 32.5
## 615	11	138	74	26	144 36.1
## 616	3	106	72	0	0 25.8
## 617	6	117	96	0	0 28.7
## 618	2	68	62	13	15 20.1
## 619	9	112	82	24	0 28.2
## 620	0	119	0	0	0 32.4
## 621	2	112	86	42	160 38.4
## 622	2	92	76	20	0 24.2
## 623	6	183	94	0	0 40.8
## 624	0	94	70	27	115 43.5
## 625	2	108	64	0	0 30.8
## 626	4	90	88	47	54 37.7
## 627	0	125	68	0	0 24.7
## 628	0	132	78	0	0 32.4
## 629	5	128	80	0	0 34.6
## 630	4	94	65	22	0 24.7
## 631	7	114	64	0	0 27.4
## 632	0	102	78	40	90 34.5
## 633	2	111	60	0	0 26.2
## 634	1	128	82	17	183 27.5
## 635	10	92	62	0	0 25.9
## 636	13	104	72	0	0 31.2
## 637	5	104	74	0	0 28.8
## 638	2	94	76	18	66 31.6
## 639	7	97	76	32	91 40.9
## 640	1	100	74	12	46 19.5
## 641	0	102	86	17	105 29.3
## 642	4	128	70	0	0 34.3
## 643	6	147	80	0	0 29.5
## 644	4	90	0	0	0 28.0
## 645	3	103	72	30	152 27.6
## 646	2	157	74	35	440 39.4
## 647	1	167	74	17	144 23.4
## 648	0	179	50	36	159 37.8
## 649	11	136	84	35	130 28.3
## 650	0	107	60	25	0 26.4
## 651	1	91	54	25	100 25.2
## 652	1	117	60	23	106 33.8
## 653	5	123	74	40	77 34.1
## 654	2	120	54	0	0 26.8
## 655	1	106	70	28	135 34.2
## 656	2	155	52	27	540 38.7
## 657	2	101	58	35	90 21.8
## 658	1	120	80	48	200 38.9
## 659	11	127	106	0	0 39.0
## 660	3	80	82	31	70 34.2
## 661	10	162	84	0	0 27.7
## 662	1	199	76	43	0 42.9

## 663	8	167	106	46	231 37.6
## 664	9	145	80	46	130 37.9
## 665	6	115	60	39	0 33.7
## 666	1	112	80	45	132 34.8
## 667	4	145	82	18	0 32.5
## 668	10	111	70	27	0 27.5
## 669	6	98	58	33	190 34.0
## 670	9	154	78	30	100 30.9
## 671	6	165	68	26	168 33.6
## 672	1	99	58	10	0 25.4
## 673	10	68	106	23	49 35.5
## 674	3	123	100	35	240 57.3
## 675	8	91	82	0	0 35.6
## 676	6	195	70	0	0 30.9
## 677	9	156	86	0	0 24.8
## 678	0	93	60	0	0 35.3
## 679	3	121	52	0	0 36.0
## 680	2	101	58	17	265 24.2
## 681	2	56	56	28	45 24.2
## 682	0	162	76	36	0 49.6
## 683	0	95	64	39	105 44.6
## 684	4	125	80	0	0 32.3
## 685	5	136	82	0	0 0.0
## 686	2	129	74	26	205 33.2
## 687	3	130	64	0	0 23.1
## 688	1	107	50	19	0 28.3
## 689	1	140	74	26	180 24.1
## 690	1	144	82	46	180 46.1
## 691	8	107	80	0	0 24.6
## 692	13	158	114	0	0 42.3
## 693	2	121	70	32	95 39.1
## 694	7	129	68	49	125 38.5
## 695	2	90	60	0	0 23.5
## 696	7	142	90	24	480 30.4
## 697	3	169	74	19	125 29.9
## 698	0	99	0	0	0 25.0
## 699	4	127	88	11	155 34.5
## 700	4	118	70	0	0 44.5
## 701	2	122	76	27	200 35.9
## 702	6	125	78	31	0 27.6
## 703	1	168	88	29	0 35.0
## 704	2	129	0	0	0 38.5
## 705	4	110	76	20	100 28.4
## 706	6	80	80	36	0 39.8
## 707	10	115	0	0	0 0.0
## 708	2	127	46	21	335 34.4
## 709	9	164	78	0	0 32.8
## 710	2	93	64	32	160 38.0
## 711	3	158	64	13	387 31.2
## 712	5	126	78	27	22 29.6
## 713	10	129	62	36	0 41.2
## 714	0	134	58	20	291 26.4
## 715	3	102	74	0	0 29.5
## 716	7	187	50	33	392 33.9
## 717	3	173	78	39	185 33.8
## 718	10	94	72	18	0 23.1
## 719	1	108	60	46	178 35.5
## 720	5	97	76	27	0 35.6
## 721	4	83	86	19	0 29.3
## 722	1	114	66	36	200 38.1
## 723	1	149	68	29	127 29.3
## 724	5	117	86	30	105 39.1
## 725	1	111	94	0	0 32.8
## 726	4	112	78	40	0 39.4
## 727	1	116	78	29	180 36.1
## 728	0	141	84	26	0 32.4
## 729	2	175	88	0	0 22.9
## 730	2	92	52	0	0 30.1
## 731	3	130	78	23	79 28.4
## 732	8	120	86	0	0 28.4
## 733	2	174	88	37	120 44.5
## 734	2	106	56	27	165 29.0
## 735	2	105	75	0	0 22.2

##	133	2	103	73	0	0 23.3
##	736	4	95	60	32	0 35.4
##	737	0	126	86	27	120 27.4
##	738	8	65	72	23	0 32.0
##	739	2	99	60	17	160 36.6
##	740	1	102	74	0	0 39.5
##	741	11	120	80	37	150 42.3
##	742	3	102	44	20	94 30.8
##	743	1	109	58	18	116 28.5
##	744	9	140	94	0	0 32.7
##	745	13	153	88	37	140 40.6
##	746	12	100	84	33	105 30.0
##	747	1	147	94	41	0 49.3
##	748	1	81	74	41	57 46.3
##	749	3	187	70	22	200 36.4
##	750	6	162	62	0	0 24.3
##	751	4	136	70	0	0 31.2
##	752	1	121	78	39	74 39.0
##	753	3	108	62	24	0 26.0
##	754	0	181	88	44	510 43.3
##	755	8	154	78	32	0 32.4
##	756	1	128	88	39	110 36.5
##	757	7	137	90	41	0 32.0
##	758	0	123	72	0	0 36.3
##	759	1	106	76	0	0 37.5
##	760	6	190	92	0	0 35.5
##	761	2	88	58	26	16 28.4
##	762	9	170	74	31	0 44.0
##	763	9	89	62	0	0 22.5
##	764	10	101	76	48	180 32.9
##	765	2	122	70	27	0 36.8
##	766	5	121	72	23	112 26.2
##	767	1	126	60	0	0 30.1
##	768	1	93	70	31	0 30.4

##	DiabetesPedigreeFunction	Age	Outcome
##	1	0.627	50
##	2	0.351	31
##	3	0.672	32
##	4	0.167	21
##	5	2.288	33
##	6	0.201	30
##	7	0.248	26
##	8	0.134	29
##	9	0.158	53
##	10	0.232	54
##	11	0.191	30
##	12	0.537	34
##	13	1.441	57
##	14	0.398	59
##	15	0.587	51
##	16	0.484	32
##	17	0.551	31
##	18	0.254	31
##	19	0.183	33
##	20	0.529	32
##	21	0.704	27
##	22	0.388	50
##	23	0.451	41
##	24	0.263	29
##	25	0.254	51
##	26	0.205	41
##	27	0.257	43
##	28	0.487	22
##	29	0.245	57
##	30	0.337	38
##	31	0.546	60
##	32	0.851	28
##	33	0.267	22
##	34	0.188	28
##	35	0.512	45
##	36	0.966	33
##	37	0.420	35
##	38	0.665	46

## 39	0.503	27	1
## 40	1.390	56	1
## 41	0.271	26	0
## 42	0.696	37	0
## 43	0.235	48	0
## 44	0.721	54	1
## 45	0.294	40	0
## 46	1.893	25	1
## 47	0.564	29	0
## 48	0.586	22	0
## 49	0.344	31	1
## 50	0.305	24	0
## 51	0.491	22	0
## 52	0.526	26	0
## 53	0.342	30	0
## 54	0.467	58	1
## 55	0.718	42	0
## 56	0.248	21	0
## 57	0.254	41	1
## 58	0.962	31	0
## 59	1.781	44	0
## 60	0.173	22	0
## 61	0.304	21	0
## 62	0.270	39	1
## 63	0.587	36	0
## 64	0.699	24	0
## 65	0.258	42	1
## 66	0.203	32	0
## 67	0.855	38	1
## 68	0.845	54	0
## 69	0.334	25	0
## 70	0.189	27	0
## 71	0.867	28	1
## 72	0.411	26	0
## 73	0.583	42	1
## 74	0.231	23	0
## 75	0.396	22	0
## 76	0.140	22	0
## 77	0.391	41	0
## 78	0.370	27	0
## 79	0.270	26	1
## 80	0.307	24	0
## 81	0.140	22	0
## 82	0.102	22	0
## 83	0.767	36	0
## 84	0.237	22	0
## 85	0.227	37	1
## 86	0.698	27	0
## 87	0.178	45	0
## 88	0.324	26	0
## 89	0.153	43	1
## 90	0.165	24	0
## 91	0.258	21	0
## 92	0.443	34	0
## 93	0.261	42	0
## 94	0.277	60	1
## 95	0.761	21	0
## 96	0.255	40	0
## 97	0.130	24	0
## 98	0.323	22	0
## 99	0.356	23	0
## 100	0.325	31	1
## 101	1.222	33	1
## 102	0.179	22	0
## 103	0.262	21	0
## 104	0.283	24	0
## 105	0.930	27	0
## 106	0.801	21	0
## 107	0.207	27	0
## 108	0.287	37	0
## 109	0.336	25	0
## 110	0.247	24	1
## 111	0.199	24	1

## 112	0.543	46	1
## 113	0.192	23	0
## 114	0.391	25	0
## 115	0.588	39	1
## 116	0.539	61	1
## 117	0.220	38	1
## 118	0.654	25	0
## 119	0.443	22	0
## 120	0.223	21	0
## 121	0.759	25	1
## 122	0.260	24	0
## 123	0.404	23	0
## 124	0.186	69	0
## 125	0.278	23	1
## 126	0.496	26	1
## 127	0.452	30	0
## 128	0.261	23	0
## 129	0.403	40	1
## 130	0.741	62	1
## 131	0.361	33	1
## 132	1.114	33	1
## 133	0.356	30	1
## 134	0.457	39	0
## 135	0.647	26	0
## 136	0.088	31	0
## 137	0.597	21	0
## 138	0.532	22	0
## 139	0.703	29	0
## 140	0.159	28	0
## 141	0.268	55	0
## 142	0.286	38	0
## 143	0.318	22	0
## 144	0.272	42	1
## 145	0.237	23	0
## 146	0.572	21	0
## 147	0.096	41	0
## 148	1.400	34	0
## 149	0.218	65	0
## 150	0.085	22	0
## 151	0.399	24	0
## 152	0.432	37	0
## 153	1.189	42	1
## 154	0.687	23	0
## 155	0.137	43	1
## 156	0.337	36	1
## 157	0.637	21	0
## 158	0.833	23	0
## 159	0.229	22	0
## 160	0.817	47	1
## 161	0.294	36	0
## 162	0.204	45	0
## 163	0.167	27	0
## 164	0.368	21	0
## 165	0.743	32	1
## 166	0.722	41	1
## 167	0.256	22	0
## 168	0.709	34	0
## 169	0.471	29	0
## 170	0.495	29	0
## 171	0.180	36	1
## 172	0.542	29	1
## 173	0.773	25	0
## 174	0.678	23	0
## 175	0.370	33	0
## 176	0.719	36	1
## 177	0.382	42	0
## 178	0.319	26	1
## 179	0.190	47	0
## 180	0.956	37	1
## 181	0.084	32	0
## 182	0.725	23	0
## 183	0.299	21	0
## 184	0.268	27	0

## 184	0.268	21	0
## 185	0.244	40	0
## 186	0.745	41	1
## 187	0.615	60	1
## 188	1.321	33	1
## 189	0.640	31	1
## 190	0.361	25	1
## 191	0.142	21	0
## 192	0.374	40	0
## 193	0.383	36	1
## 194	0.578	40	1
## 195	0.136	42	0
## 196	0.395	29	1
## 197	0.187	21	0
## 198	0.678	23	1
## 199	0.905	26	1
## 200	0.150	29	1
## 201	0.874	21	0
## 202	0.236	28	0
## 203	0.787	32	0
## 204	0.235	27	0
## 205	0.324	55	0
## 206	0.407	27	0
## 207	0.605	57	1
## 208	0.151	52	1
## 209	0.289	21	0
## 210	0.355	41	1
## 211	0.290	25	0
## 212	0.375	24	0
## 213	0.164	60	0
## 214	0.431	24	1
## 215	0.260	36	1
## 216	0.742	38	1
## 217	0.514	25	1
## 218	0.464	32	0
## 219	1.224	32	1
## 220	0.261	41	1
## 221	1.072	21	1
## 222	0.805	66	1
## 223	0.209	37	0
## 224	0.687	61	0
## 225	0.666	26	0
## 226	0.101	22	0
## 227	0.198	26	0
## 228	0.652	24	1
## 229	2.329	31	0
## 230	0.089	24	0
## 231	0.645	22	1
## 232	0.238	46	1
## 233	0.583	22	0
## 234	0.394	29	0
## 235	0.293	23	0
## 236	0.479	26	1
## 237	0.586	51	1
## 238	0.686	23	1
## 239	0.831	32	1
## 240	0.582	27	0
## 241	0.192	21	0
## 242	0.446	22	0
## 243	0.402	22	1
## 244	1.318	33	1
## 245	0.329	29	0
## 246	1.213	49	1
## 247	0.258	41	0
## 248	0.427	23	0
## 249	0.282	34	0
## 250	0.143	23	0
## 251	0.380	42	0
## 252	0.284	27	0
## 253	0.249	24	0
## 254	0.238	25	0
## 255	0.926	44	1
## 256	0.543	21	1

## 257	0.557	30	0
## 258	0.092	25	0
## 259	0.655	24	0
## 260	1.353	51	1
## 261	0.299	34	0
## 262	0.761	27	1
## 263	0.612	24	0
## 264	0.200	63	0
## 265	0.226	35	1
## 266	0.997	43	0
## 267	0.933	25	1
## 268	1.101	24	0
## 269	0.078	21	0
## 270	0.240	28	1
## 271	1.136	38	1
## 272	0.128	21	0
## 273	0.254	40	0
## 274	0.422	21	0
## 275	0.251	52	0
## 276	0.677	25	0
## 277	0.296	29	1
## 278	0.454	23	0
## 279	0.744	57	0
## 280	0.881	22	0
## 281	0.334	28	1
## 282	0.280	39	0
## 283	0.262	37	0
## 284	0.165	47	1
## 285	0.259	52	1
## 286	0.647	51	0
## 287	0.619	34	0
## 288	0.808	29	1
## 289	0.340	26	0
## 290	0.263	33	0
## 291	0.434	21	0
## 292	0.757	25	1
## 293	1.224	31	1
## 294	0.613	24	1
## 295	0.254	65	0
## 296	0.692	28	0
## 297	0.337	29	1
## 298	0.520	24	0
## 299	0.412	46	1
## 300	0.840	58	0
## 301	0.839	30	1
## 302	0.422	25	1
## 303	0.156	35	0
## 304	0.209	28	1
## 305	0.207	37	0
## 306	0.215	29	0
## 307	0.326	47	1
## 308	0.143	21	0
## 309	1.391	25	1
## 310	0.875	30	1
## 311	0.313	41	0
## 312	0.605	22	0
## 313	0.433	27	1
## 314	0.626	25	0
## 315	1.127	43	1
## 316	0.315	26	0
## 317	0.284	30	0
## 318	0.345	29	1
## 319	0.150	28	0
## 320	0.129	59	1
## 321	0.527	31	0
## 322	0.197	25	1
## 323	0.254	36	1
## 324	0.731	43	1
## 325	0.148	21	0
## 326	0.123	24	0
## 327	0.692	30	1
## 328	0.200	37	0
## 329	0.127	23	1



## 330	0.122	37	0
## 331	1.476	46	0
## 332	0.166	25	0
## 333	0.282	41	1
## 334	0.137	44	0
## 335	0.260	22	0
## 336	0.259	26	0
## 337	0.932	44	0
## 338	0.343	44	1
## 339	0.893	33	1
## 340	0.331	41	1
## 341	0.472	22	0
## 342	0.673	36	0
## 343	0.389	22	0
## 344	0.290	33	0
## 345	0.485	57	0
## 346	0.349	49	0
## 347	0.654	22	0
## 348	0.187	23	0
## 349	0.279	26	0
## 350	0.346	37	1
## 351	0.237	29	0
## 352	0.252	30	0
## 353	0.243	46	0
## 354	0.580	24	0
## 355	0.559	21	0
## 356	0.302	49	1
## 357	0.962	28	1
## 358	0.569	44	1
## 359	0.378	48	0
## 360	0.875	29	1
## 361	0.583	29	1
## 362	0.207	63	0
## 363	0.305	65	0
## 364	0.520	67	1
## 365	0.385	30	0
## 366	0.499	30	0
## 367	0.368	29	1
## 368	0.252	21	0
## 369	0.306	22	0
## 370	0.234	45	1
## 371	2.137	25	1
## 372	1.731	21	0
## 373	0.545	21	0
## 374	0.225	25	0
## 375	0.816	28	0
## 376	0.528	58	1
## 377	0.299	22	0
## 378	0.509	22	0
## 379	0.238	32	1
## 380	1.021	35	0
## 381	0.821	24	0
## 382	0.236	22	0
## 383	0.947	21	0
## 384	1.268	25	0
## 385	0.221	25	0
## 386	0.205	24	0
## 387	0.660	35	1
## 388	0.239	45	1
## 389	0.452	58	1
## 390	0.949	28	0
## 391	0.444	42	0
## 392	0.340	27	1
## 393	0.389	21	0
## 394	0.463	37	0
## 395	0.803	31	1
## 396	1.600	25	0
## 397	0.944	39	0
## 398	0.196	22	1
## 399	0.389	25	0
## 400	0.241	25	1
## 401	0.161	31	1
## 402	0.151	55	0

## 402	0.151	33	0
## 403	0.286	35	1
## 404	0.280	38	0
## 405	0.135	41	1
## 406	0.520	26	0
## 407	0.376	46	1
## 408	0.336	25	0
## 409	1.191	39	1
## 410	0.702	28	1
## 411	0.674	28	0
## 412	0.528	25	0
## 413	1.076	22	0
## 414	0.256	21	0
## 415	0.534	21	1
## 416	0.258	22	1
## 417	1.095	22	0
## 418	0.554	37	1
## 419	0.624	27	0
## 420	0.219	28	1
## 421	0.507	26	0
## 422	0.561	21	0
## 423	0.496	21	0
## 424	0.421	21	0
## 425	0.516	36	1
## 426	0.264	31	1
## 427	0.256	25	0
## 428	0.328	38	1
## 429	0.284	26	0
## 430	0.233	43	1
## 431	0.108	23	0
## 432	0.551	38	0
## 433	0.527	22	0
## 434	0.167	29	0
## 435	1.138	36	0
## 436	0.205	29	1
## 437	0.244	41	0
## 438	0.434	28	0
## 439	0.147	21	0
## 440	0.727	31	0
## 441	0.435	41	1
## 442	0.497	22	0
## 443	0.230	24	0
## 444	0.955	33	1
## 445	0.380	30	1
## 446	2.420	25	1
## 447	0.658	28	0
## 448	0.330	26	0
## 449	0.510	22	1
## 450	0.285	26	0
## 451	0.415	23	0
## 452	0.542	23	1
## 453	0.381	25	0
## 454	0.832	72	0
## 455	0.498	24	0
## 456	0.212	38	1
## 457	0.687	62	0
## 458	0.364	24	0
## 459	1.001	51	1
## 460	0.460	81	0
## 461	0.733	48	0
## 462	0.416	26	0
## 463	0.705	39	0
## 464	0.258	37	0
## 465	1.022	34	0
## 466	0.452	21	0
## 467	0.269	22	0
## 468	0.600	25	0
## 469	0.183	38	1
## 470	0.571	27	0
## 471	0.607	28	0
## 472	0.170	22	0
## 473	0.259	22	0
## 474	0.210	50	0

## 475	0.126	24	0
## 476	0.231	59	0
## 477	0.711	29	1
## 478	0.466	31	0
## 479	0.162	39	0
## 480	0.419	63	0
## 481	0.344	35	1
## 482	0.197	29	0
## 483	0.306	28	0
## 484	0.233	23	0
## 485	0.630	31	1
## 486	0.365	24	1
## 487	0.536	21	0
## 488	1.159	58	0
## 489	0.294	28	0
## 490	0.551	67	0
## 491	0.629	24	0
## 492	0.292	42	0
## 493	0.145	33	0
## 494	1.144	45	1
## 495	0.174	22	0
## 496	0.304	66	0
## 497	0.292	30	0
## 498	0.547	25	0
## 499	0.163	55	1
## 500	0.839	39	0
## 501	0.313	21	0
## 502	0.267	28	0
## 503	0.727	41	1
## 504	0.738	41	0
## 505	0.238	40	0
## 506	0.263	38	0
## 507	0.314	35	1
## 508	0.692	21	0
## 509	0.968	21	0
## 510	0.409	64	0
## 511	0.297	46	1
## 512	0.207	21	0
## 513	0.200	58	0
## 514	0.525	22	0
## 515	0.154	24	0
## 516	0.268	28	1
## 517	0.771	53	1
## 518	0.304	51	0
## 519	0.180	41	0
## 520	0.582	60	0
## 521	0.187	25	0
## 522	0.305	26	0
## 523	0.189	26	0
## 524	0.652	45	1
## 525	0.151	24	0
## 526	0.444	21	0
## 527	0.299	21	0
## 528	0.107	24	0
## 529	0.493	22	0
## 530	0.660	31	0
## 531	0.717	22	0
## 532	0.686	24	0
## 533	0.917	29	0
## 534	0.501	31	0
## 535	1.251	24	0
## 536	0.302	23	1
## 537	0.197	46	0
## 538	0.735	67	0
## 539	0.804	23	0
## 540	0.968	32	1
## 541	0.661	43	1
## 542	0.549	27	1
## 543	0.825	56	1
## 544	0.159	25	0
## 545	0.365	29	0
## 546	0.423	37	1
## 547	1.034	53	1

## 548	0.160	28	0
## 549	0.341	50	0
## 550	0.680	37	0
## 551	0.204	21	0
## 552	0.591	25	0
## 553	0.247	66	0
## 554	0.422	23	0
## 555	0.471	28	0
## 556	0.161	37	0
## 557	0.218	30	0
## 558	0.237	58	0
## 559	0.126	42	0
## 560	0.300	35	0
## 561	0.121	54	1
## 562	0.502	28	1
## 563	0.401	24	0
## 564	0.497	32	0
## 565	0.601	27	0
## 566	0.748	22	0
## 567	0.412	21	0
## 568	0.085	46	0
## 569	0.338	37	0
## 570	0.203	33	1
## 571	0.270	39	0
## 572	0.268	21	0
## 573	0.430	22	0
## 574	0.198	22	0
## 575	0.892	23	0
## 576	0.280	25	0
## 577	0.813	35	0
## 578	0.693	21	1
## 579	0.245	36	0
## 580	0.575	62	1
## 581	0.371	21	1
## 582	0.206	27	0
## 583	0.259	62	0
## 584	0.190	42	0
## 585	0.687	52	1
## 586	0.417	22	0
## 587	0.129	41	1
## 588	0.249	29	0
## 589	1.154	52	1
## 590	0.342	25	0
## 591	0.925	45	1
## 592	0.175	24	0
## 593	0.402	44	1
## 594	1.699	25	0
## 595	0.733	34	0
## 596	0.682	22	1
## 597	0.194	46	0
## 598	0.559	21	0
## 599	0.088	38	1
## 600	0.407	26	0
## 601	0.400	24	0
## 602	0.190	28	0
## 603	0.100	30	0
## 604	0.692	54	1
## 605	0.212	36	1
## 606	0.514	21	0
## 607	1.258	22	1
## 608	0.482	25	0
## 609	0.270	27	0
## 610	0.138	23	0
## 611	0.292	24	0
## 612	0.593	36	1
## 613	0.787	40	1
## 614	0.878	26	0
## 615	0.557	50	1
## 616	0.207	27	0
## 617	0.157	30	0
## 618	0.257	23	0
## 619	1.282	50	1
## 620	0.141	24	1

## 620	0.141	24	1
## 621	0.246	28	0
## 622	1.698	28	0
## 623	1.461	45	0
## 624	0.347	21	0
## 625	0.158	21	0
## 626	0.362	29	0
## 627	0.206	21	0
## 628	0.393	21	0
## 629	0.144	45	0
## 630	0.148	21	0
## 631	0.732	34	1
## 632	0.238	24	0
## 633	0.343	23	0
## 634	0.115	22	0
## 635	0.167	31	0
## 636	0.465	38	1
## 637	0.153	48	0
## 638	0.649	23	0
## 639	0.871	32	1
## 640	0.149	28	0
## 641	0.695	27	0
## 642	0.303	24	0
## 643	0.178	50	1
## 644	0.610	31	0
## 645	0.730	27	0
## 646	0.134	30	0
## 647	0.447	33	1
## 648	0.455	22	1
## 649	0.260	42	1
## 650	0.133	23	0
## 651	0.234	23	0
## 652	0.466	27	0
## 653	0.269	28	0
## 654	0.455	27	0
## 655	0.142	22	0
## 656	0.240	25	1
## 657	0.155	22	0
## 658	1.162	41	0
## 659	0.190	51	0
## 660	1.292	27	1
## 661	0.182	54	0
## 662	1.394	22	1
## 663	0.165	43	1
## 664	0.637	40	1
## 665	0.245	40	1
## 666	0.217	24	0
## 667	0.235	70	1
## 668	0.141	40	1
## 669	0.430	43	0
## 670	0.164	45	0
## 671	0.631	49	0
## 672	0.551	21	0
## 673	0.285	47	0
## 674	0.880	22	0
## 675	0.587	68	0
## 676	0.328	31	1
## 677	0.230	53	1
## 678	0.263	25	0
## 679	0.127	25	1
## 680	0.614	23	0
## 681	0.332	22	0
## 682	0.364	26	1
## 683	0.366	22	0
## 684	0.536	27	1
## 685	0.640	69	0
## 686	0.591	25	0
## 687	0.314	22	0
## 688	0.181	29	0
## 689	0.828	23	0
## 690	0.335	46	1
## 691	0.856	34	0
## 692	0.257	44	1

## 693	0.886	23	0
## 694	0.439	43	1
## 695	0.191	25	0
## 696	0.128	43	1
## 697	0.268	31	1
## 698	0.253	22	0
## 699	0.598	28	0
## 700	0.904	26	0
## 701	0.483	26	0
## 702	0.565	49	1
## 703	0.905	52	1
## 704	0.304	41	0
## 705	0.118	27	0
## 706	0.177	28	0
## 707	0.261	30	1
## 708	0.176	22	0
## 709	0.148	45	1
## 710	0.674	23	1
## 711	0.295	24	0
## 712	0.439	40	0
## 713	0.441	38	1
## 714	0.352	21	0
## 715	0.121	32	0
## 716	0.826	34	1
## 717	0.970	31	1
## 718	0.595	56	0
## 719	0.415	24	0
## 720	0.378	52	1
## 721	0.317	34	0
## 722	0.289	21	0
## 723	0.349	42	1
## 724	0.251	42	0
## 725	0.265	45	0
## 726	0.236	38	0
## 727	0.496	25	0
## 728	0.433	22	0
## 729	0.326	22	0
## 730	0.141	22	0
## 731	0.323	34	1
## 732	0.259	22	1
## 733	0.646	24	1
## 734	0.426	22	0
## 735	0.560	53	0
## 736	0.284	28	0
## 737	0.515	21	0
## 738	0.600	42	0
## 739	0.453	21	0
## 740	0.293	42	1
## 741	0.785	48	1
## 742	0.400	26	0
## 743	0.219	22	0
## 744	0.734	45	1
## 745	1.174	39	0
## 746	0.488	46	0
## 747	0.358	27	1
## 748	1.096	32	0
## 749	0.408	36	1
## 750	0.178	50	1
## 751	1.182	22	1
## 752	0.261	28	0
## 753	0.223	25	0
## 754	0.222	26	1
## 755	0.443	45	1
## 756	1.057	37	1
## 757	0.391	39	0
## 758	0.258	52	1
## 759	0.197	26	0
## 760	0.278	66	1
## 761	0.766	22	0
## 762	0.403	43	1
## 763	0.142	33	0
## 764	0.171	63	0
## 765	0.340	27	0

```
## 766                0.245  30      0
## 767                0.349  47      1
## 768                0.315  23      0
```

```
library(Amelia) #This library is used to plot missmap
```

```
## Loading required package: Rcpp
```

```
## ##
## ## Amelia II: Multiple Imputation
## ## (Version 1.7.5, built: 2018-05-07)
## ## Copyright (C) 2005-2019 James Honaker, Gary King and Matthew Blackwell
## ## Refer to http://gking.harvard.edu/amelia/ for more information
## ##
```

```
library(ggplot2)
library(ggcorrplot)
```

```
## Warning: package 'ggcorrplot' was built under R version 3.5.2
```

```
library(GGally)
```

```
## Warning: package 'GGally' was built under R version 3.5.2
```

```
library(PerformanceAnalytics)
```

```
## Warning: package 'PerformanceAnalytics' was built under R version 3.5.2
```

```
## Loading required package: xts
```

```
## Loading required package: zoo
```

```
##
## Attaching package: 'zoo'
```

```
## The following objects are masked from 'package:base':
##
##   as.Date, as.Date.numeric
```

```
##
## Attaching package: 'PerformanceAnalytics'
```

```
## The following object is masked from 'package:graphics':
##
##   legend
```

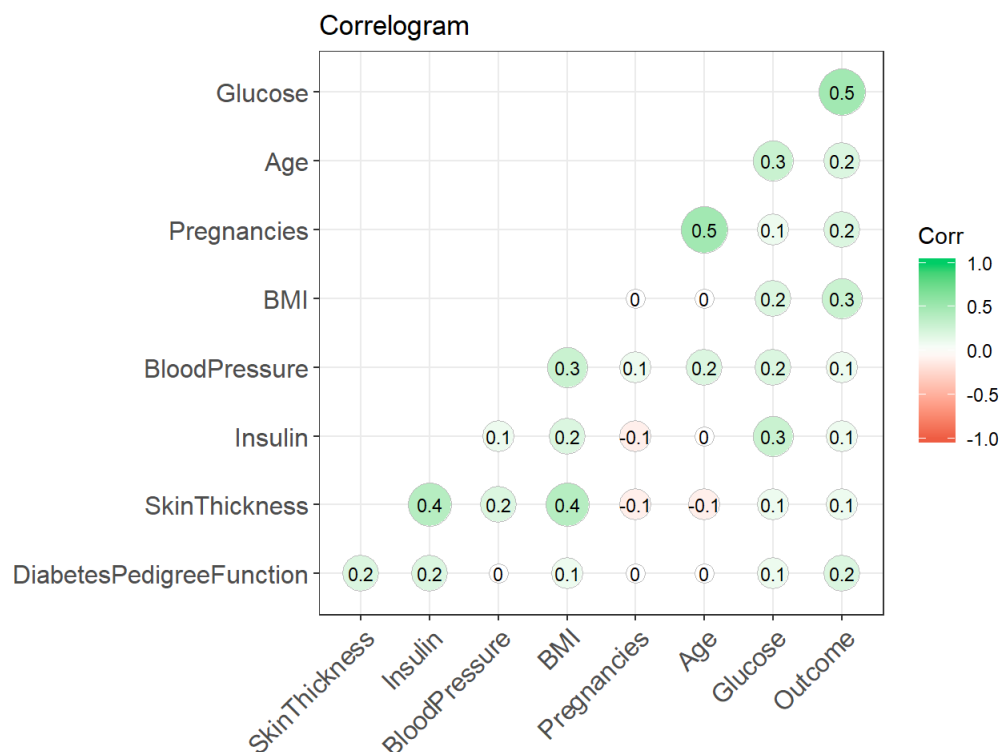
```
library(gridExtra)
```

```
# Correlation matrix
#This plot shows us correlation coefficients of all the variables.
```

```
data(my_data)
```

```
## Warning in data(my_data): data set 'my_data' not found
```

```
corr <- round(cor(my_data), 1)
# Plot
ggcorrplot(corr, hc.order = TRUE,
  type = "lower",
  lab = TRUE,
  lab_size = 3,
  method="circle",
  colors = c("tomato2", "white", "springgreen3"),
  title="Correlogram",
  ggtheme=theme_bw)
```



*# From the plot, we can say that the variable Glucose has a higher impact on the Outcome variable. They are highly Co-rrelated.*

*#Pregnancies and Age are strongly correlated with coeeficient value 0.54.*

*#SkinThickness , BMI and Skinthickness and Insulin are positively correlated with coeeficient values 0.4.*

*#Changing outcome from numerical to categorical varibale.*

```
my_data$Outcome<- is.factor(my_data$Outcome)
```

```
levels(my_data$Outcome) <- c("No", "Yes")
```

*#correlation plot*

*#This plot shows the relationship between the variables.*

```
ggpairs(my_data, aes(color=Outcome, alpha=0.75), lower=list(continuous="smooth"))+ theme_bw()+
  labs(title="Correlation Plot of Variance(diabetes)") +
  theme(plot.title=element_text(face='bold',color='black',hjust=0.5,size=12))
```

```
## `stat_bin()` using `bins = 30`. Pick better value with `binwidth`.
```

```
## `stat_bin()` using `bins = 30`. Pick better value with `binwidth`.
```

```
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```

```
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```

```
## `stat_bin()` using `bins = 30`. Pick better value with `binwidth`.
```

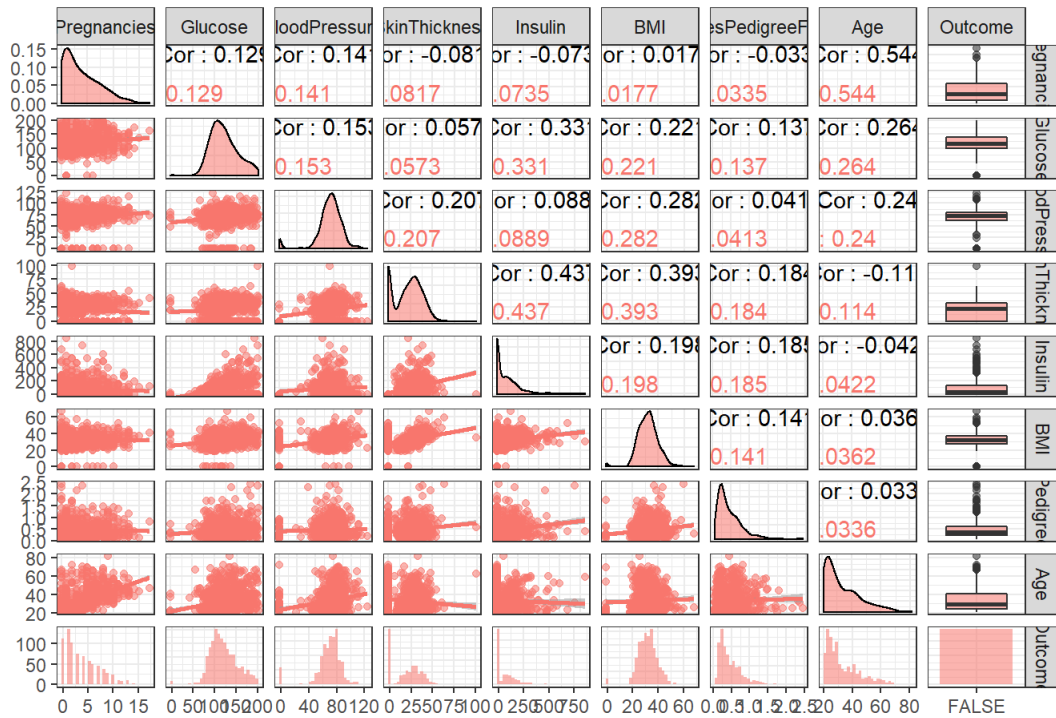
```
## `stat_bin()` using `bins = 30`. Pick better value with `binwidth`.
```

```
## `stat_bin()` using `bins = 30`. Pick better value with `binwidth`.
```

```
## `stat_bin()` using `bins = 30`. Pick better value with `binwidth`.
```



### Correlation Plot of Variance(diabetes)

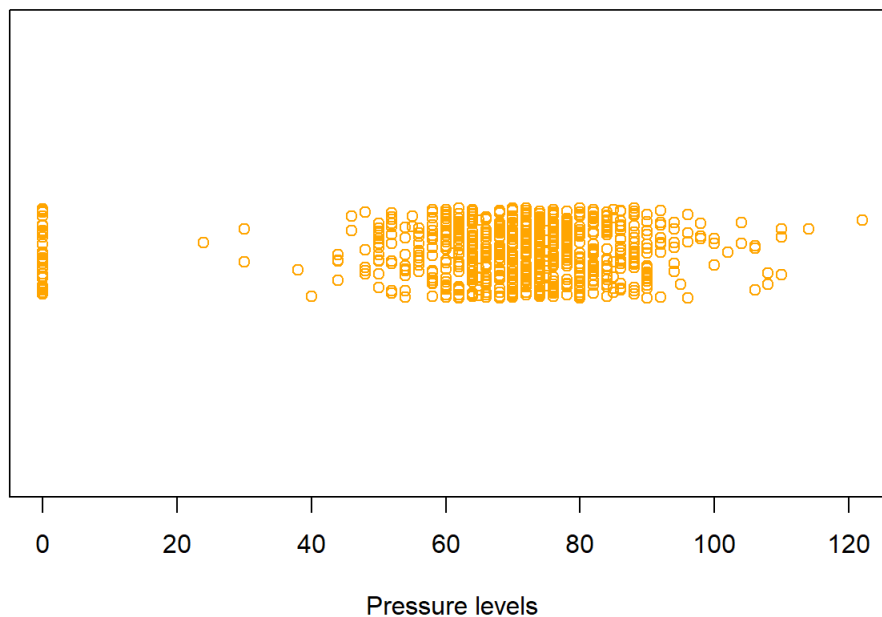


#From the box plots in the last segment, we see the variables Insulin, BloodPressure, and the DiabetesPedigreeFunction contain many outliers.

#stripchart is like scatter plots (or dot plots) of the given data.  
#It's like an alternative to boxplots when sample sizes are small and are also used to check outliers present in each variables

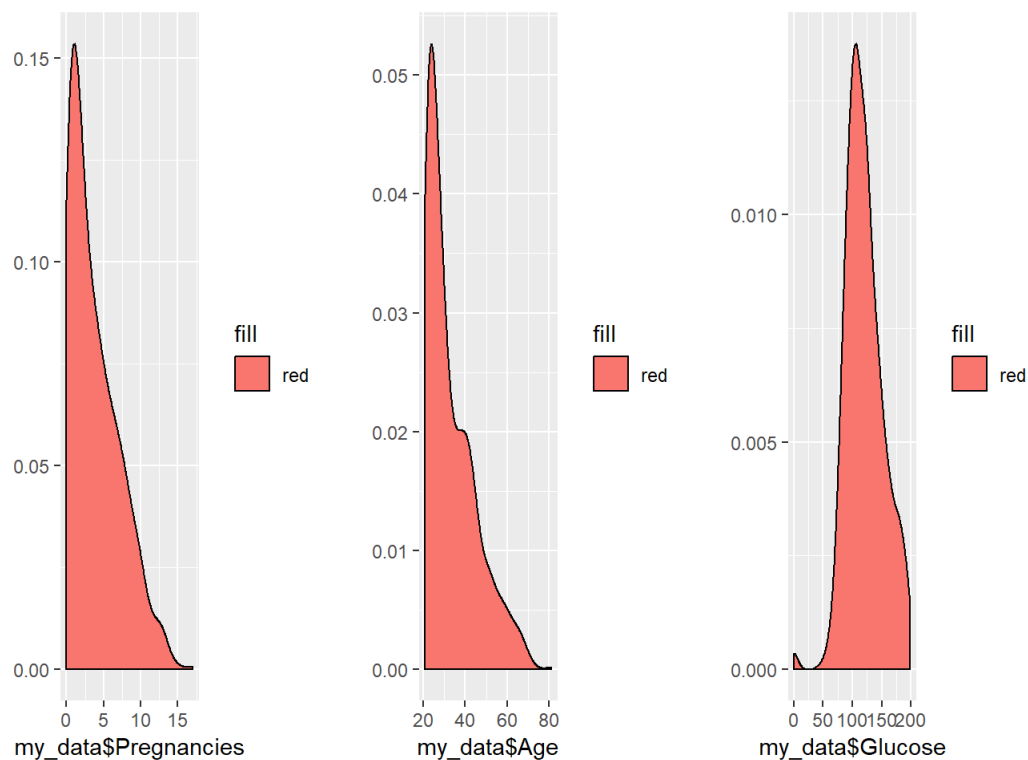
```
stripchart(my_data$BloodPressure,
           main="Blood pressure levels",
           xlab="Pressure levels",
           ylab="",
           method="jitter",
           col="orange",
           pch=1)
```

### Blood pressure levels



```
#Densityplots
```

```
plot1 = qplot(my_data$Pregnancies, data = my_data, geom = "density", fill = "red")
plot2 = qplot(my_data$Age, data = my_data, geom = "density", fill = "red")
plot3 = qplot(my_data$Glucose, data = my_data, geom = "density", fill = "red")
plot4 = qplot(my_data$BloodPressure, data = my_data, geom = "density", fill = "red")
grid.arrange(plot1, plot2, plot3, ncol = 3)
```

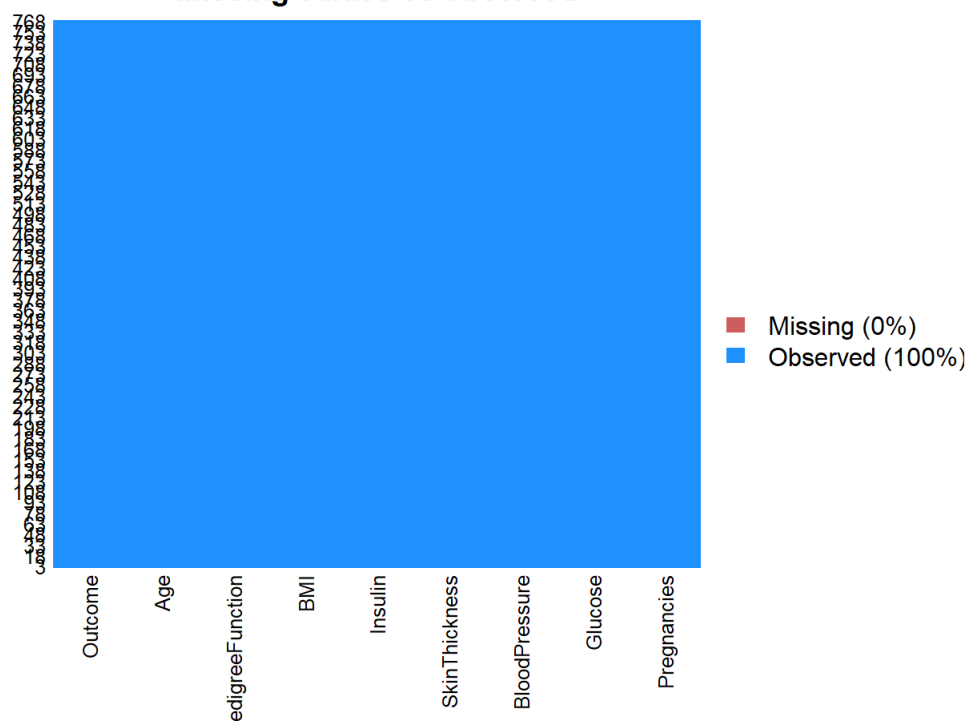


*#The density plot here shows the distribution of the data and if they are positively or negatively skewed.*

*#Plots a missingness map showing where missingness occurs in the dataset*

```
missmap(my_data, main = "Missing values vs observed")
```

### Missing values vs observed



*#No missing Values occurred in our dataset.*