```
> cor.test(GI,Human.development)

        Pearson's product-moment correlation

data:  GI and Human.development
t = -6.9485, df = 165, p-value = 8.137e-11
alternative hypothesis: true correlation is not equal to 0
95 percent confidence interval:
 -0.5853564 -0.3491520
sample estimates:
      cor
-0.4757877
```
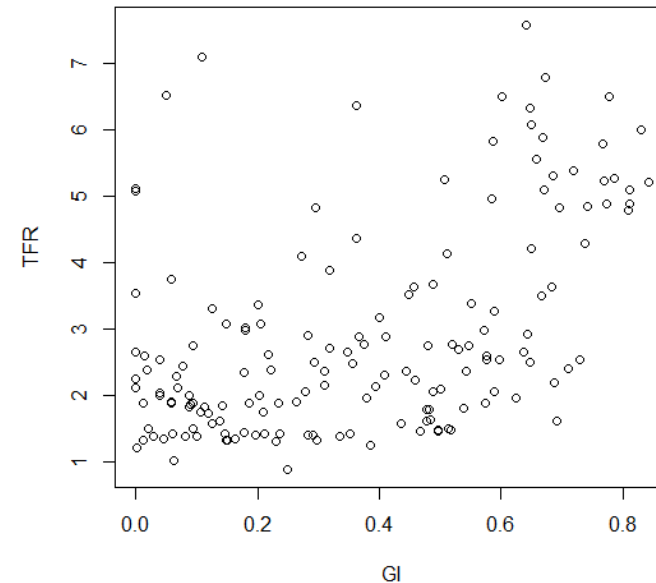
```
> cor.test(GI,TFR)

        Pearson's product-moment correlation

data:  GI and TFR
t = 7.2353, df = 159, p-value = 1.859e-11
alternative hypothesis: true correlation is not equal to 0
95 percent confidence interval:
 0.3716194 0.6057328
sample estimates:
      cor
0.4976871
```

Human Development   Total Fertility Rate
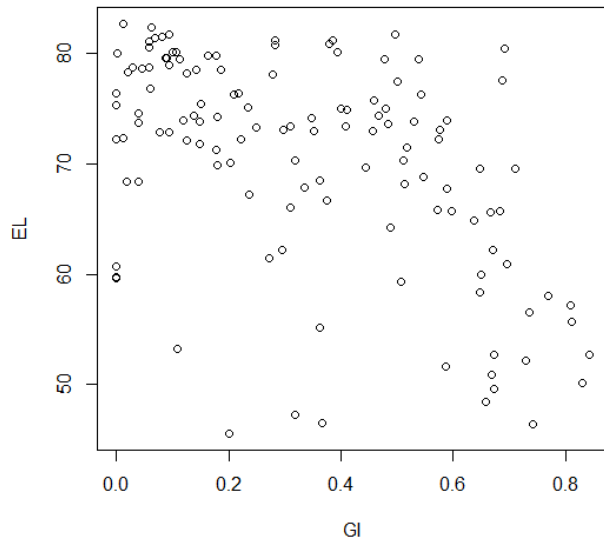
> cor.test(GI,EL)

        Pearson's product-moment correlation

data: GI and EL
t = -6.5014, df = 124, p-value = 1.754e-09
alternative hypothesis: true correlation is not equal to 0
95 percent confidence interval:
 -0.6240726 -0.3611433
sample estimates:
       cor
-0.5042016
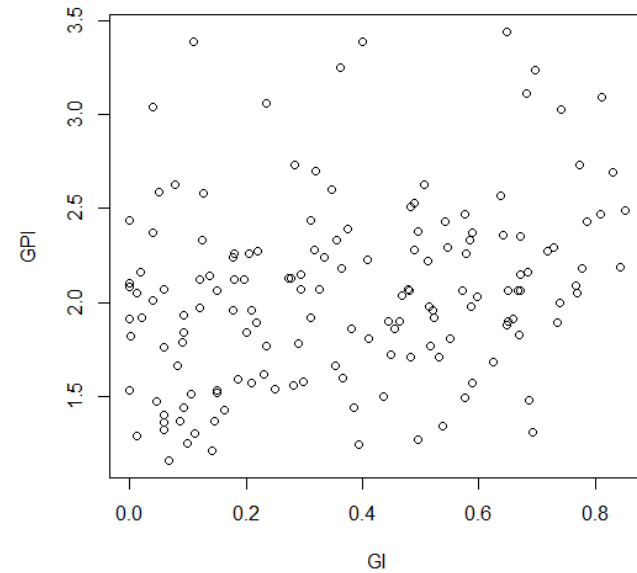
> cor.test(GI,GPI)

        Pearson's product-moment correlation

data: GI and GPI
 = 3.5653, df = 151, p-value = 0.0004871
lternative hypothesis: true correlation is not equal to 0
5 percent confidence interval:
0.1255193 0.4188080
ample estimates:
     cor
 .2786476

Life Expectancy   Global Peace
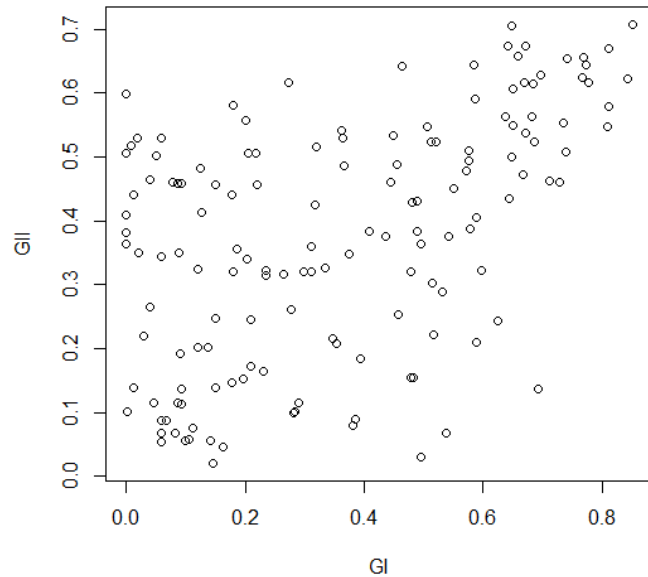
```
> cor.test(GI,GII)

        Pearson's product-moment correlation

data:  GI and GII
t = 7.1868, df = 145, p-value = 3.23e-11
alternative hypothesis: true correlation is not equal to 0
95 percent confidence interval:
 0.3823210 0.6227201
sample estimates:
      cor
0.5124934
```

```
> cor.test(GI,Urbanization.rate)

        Pearson's product-moment correlation

data:  GI and Urbanization.rate
t = -2.7947, df = 159, p-value = 0.005834
alternative hypothesis: true correlation is not equal to 0
95 percent confidence interval:
 -0.35904196 -0.06384595
sample estimates:
      cor
-0.2163839
```
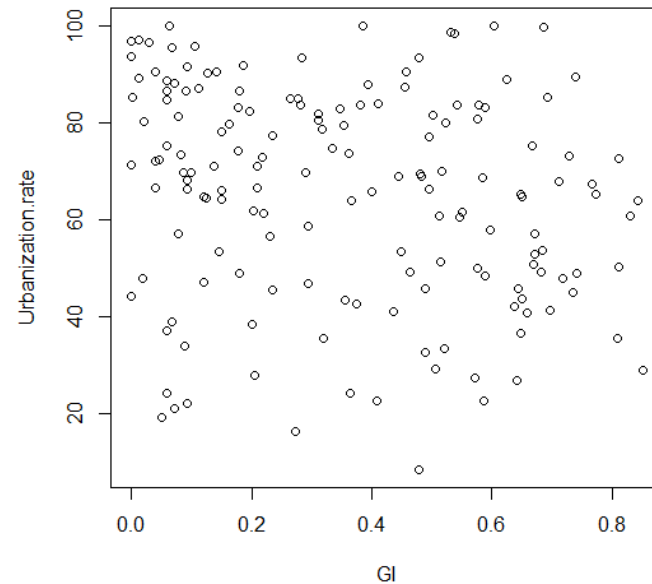
Gender Inequality   Urbanization Rate

picture3

S2 | =COUNTIF(C2:R2,"")

	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
1	GII	Exchange rate	Economic g	Total fertil	Life expec	Economic	Crime/10	gender ec	Woman p	Mobileph	urbanizati	Human d	GNI/pers	consumer price	
2	0.705	55.38	4.2	6.33	58.4	N/A		0.705	27.6	70	36.7	0.468	1904	127.2	1
3	0.245	105.67	1.3	1.75	76.3	65.2	157	0.245	17.9	116.2	71.1	0.716	9225	107.6	0
4	0.425	79.37	2.7	2.72	70.3	49.6		0.425	25.8	102	78.7	0.717	12555	117.5	1
5		0.75		6.5											13
6		96.52	4.1		49.6	47.3	2079	-	34.1	61.9	57.1	0.526	6323	136.1	2
7		2.7	0.6				10	-	19.4	127.1	22.1	0.774	18800	108.1	5

D176 | =AVERAGE(D2:D174)

	A	B	C	D	E	F
157	TOGO	TGO	0.8118		0.579	494
158	TONGA	TON	0.0869		0.458	
159	TRINIDAD AND T	TTO	0.4783	2.07	0.321	6
160	TUNISIA	TUN	0.0391	2.01	0.265	1
161	TURKEY	TUR	0.31	2.44	0.36	
162	TURKMENISTAN	TKM	0.2932	2.15		
163	UGANDA	UGA	0.363	2.18	0.529	2586
164	UKRAINE	UKR	0.3349	2.24	0.326	7
165	UNITED ARAB EM	ARE	0.6246	1.68	0.244	3
166	UNITED KINGDO	GBR	0.0901	1.79	0.193	0
167	UNITED STATES	USA	0.278	2.13	0.262	
168	URUGUAY	URY	0	1.53	0.364	20
169	UZBEKISTAN	UZB	0.3564	2.33		
170	VANUATU	VUT	0.0405			
171	VENEZUELA	VEN	0.0392	2.37	0.464	6
172	VIETNAM	VNM	0.235	1.77	0.322	2093
173	ZAMBIA	ZMB	0.6681	1.83	0.617	
174	ZIMBABWE	ZWE	0.3187	2.7	0.516	
175				25	26	
176				2.034797		

D175 | =COUNTIF(D2:D174,"")

	A	B	C	D	E	F	G	H	I	J
157	TOGO	TGO	0.8118		0.579	494.04	5.1	4.89		4
158	TONGA	TON	0.0869		0.458		0.5			
159	TRINIDAD AND T	TTO	0.4783	2.07	0.321	6.44	1.6	1.8		6
160	TUNISIA	TUN	0.0391	2.01	0.265	1.63	2.8	2.05	74.6	
161	TURKEY	TUR	0.31	2.44	0.36	1.9	4	2.16	73.4	6
162	TURKMENISTAN	TKM	0.2932	2.15			10.2	2.5		4
163	UGANDA	UGA	0.363	2.18	0.529	2586.89		6.38	55.2	6
164	UKRAINE	UKR	0.3349	2.24	0.326	7.99	1.9	1.39	67.9	4
165	UNITED ARAB EM	ARE	0.6246	1.68	0.244	3.67		1.97		7
166	UNITED KINGDO	GBR	0.0901	1.79	0.193	0.64	1.7	1.88	79.6	7
167	UNITED STATES	USA	0.278	2.13	0.262	1	1.9	2.06	78.1	
168	URUGUAY	URY	0	1.53	0.364	20.48	4.4	2.12	76.4	6
169	UZBEKISTAN	UZB	0.3564	2.33			8	2.49		
170	VANUATU	VUT	0.0405				2.8			5
171	VENEZUELA	VEN	0.0392	2.37	0.464	6.05	1.3	2.55	73.7	3
172	VIETNAM	VNM	0.235	1.77	0.322	20933.4	5.4	1.89	75.1	5
173	ZAMBIA	ZMB	0.6681	1.83	0.617	5.4	6.4	5.9	50.9	
174	ZIMBABWE	ZWE	0.3187	2.7	0.516		1.8	3.9	47.3	2
175				25	26	20	18	18	49	

picture4

```
> all.lm <- lm(GI ~ GPI+GII+Exchange.rate+Economic.growth.rate+
+ Total.fertility.rate+Economic.Freedom+gender.equality+Woman.politician+
+ Mobilephone.member.100+urbanization.rate+Human.development+GNI.person+
+ consumer.price,data=filtered)
> step(all.lm)
Start:  AIC=-519.41
GI ~ GPI + GII + Exchange.rate + Economic.growth.rate + Total.fertility.rate$
    Economic.Freedom + gender.equality + Woman.politician + Mobilephone.memb$
    urbanization.rate + Human.development + GNI.person + consumer.price


                        Df Sum of Sq   RSS     AIC
- Woman.politician       1   0.00278 6.9647 -521.34
- consumer.price         1   0.00313 6.9650 -521.33
- Economic.growth.rate   1   0.01990 6.9818 -520.92
- Exchange.rate          1   0.02273 6.9846 -520.85
- urbanization.rate      1   0.02419 6.9861 -520.81
- gender.equality        1   0.02894 6.9909 -520.70
- GPI                    1   0.03242 6.9943 -520.61
- Mobilephone.member.100 1   0.03333 6.9953 -520.59
- GII                    1   0.07709 7.0390 -519.52
- Economic.Freedom       1   0.07910 7.0410 -519.47
<none>                             6.96
- Total.fertility.rate   1   0.15088 7.11
- GNI.person             1   0.31884 7.28
- Human.development      1   0.33124 7.29

Step:  AIC=-521.34
GI ~ GPI + GII + Exchange.rate + Economic.
    Economic.Freedom + gender.equality + M
    urbanization.rate + Human.development

                        Df Sum of Sq    R
```

```
Step:   AIC=-531.65
GI ~ GII + Total.fertility.rate + Mobilephone.member.100 + Human.development$
    GNI.person

                        Df Sum of Sq    RSS     AIC
<none>                             7.1167 -531.65
- Mobilephone.member.100 1   0.08997 7.2067 -531.50
- GII                    1   0.13414 7.2508 -530.45
- Total.fertility.rate   1   0.22697 7.3437 -528.28
- Human.development      1   0.25069 7.3674 -527.73
- GNI.person             1   0.37954 7.4962 -524.76

Call:
lm(formula = GI ~ GII + Total.fertility.rate + Mobilephone.member.100 +
    Human.development + GNI.person, data = filtered)

Coefficients:
            (Intercept)                    GII    Total.fertility.rate
              4.151e-01               2.796e-01                4.464e-02
 Mobilephone.member.100       Human.development              GNI.person
              7.398e-04              -6.367e-01                4.011e-06
```

```
> new.lm <- lm(formula = GI ~ GII + Total.fertility.rate + Mobilephone.membe$
+       Human.development + GNI.person, data = filtered)
> summary(new.lm)

Call:
lm(formula = GI ~ GII + Total.fertility.rate + Mobilephone.member.100 +
    Human.development + GNI.person, data = filtered)

Residuals:
     Min       1Q   Median       3Q      Max
-0.56950 -0.15251 -0.00686  0.15925  0.51478

Coefficients:
                         Estimate Std. Error t value Pr(>|t|)
(Intercept)             4.151e-01  2.240e-01   1.854  0.06558 .
GII                     2.796e-01  1.586e-01   1.764  0.07966 .
Total.fertility.rate    4.464e-02  1.946e-02   2.294  0.02305 *
Mobilephone.member.100  7.398e-04  5.122e-04   1.444  0.15055
Human.development      -6.367e-01  2.641e-01  -2.411  0.01701 *
GNI.person              4.011e-06  1.352e-06   2.966  0.00346 **
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.2077 on 165 degrees of freedom
  (5 observations deleted due to missingness)
Multiple R-squared:  0.3335,    Adjusted R-squared:  0.3133
F-statistic: 16.51 on 5 and 165 DF,  p-value: 3.357e-13
```

```
> new2.lm <- lm(formula = GI ~ GII + Total.fertility.rate +
+       Human.development + GNI.person, data = filtered)
> summary(new2.lm)

Call:
lm(formula = GI ~ GII + Total.fertility.rate + Human.development +
    GNI.person, data = filtered)

Residuals:
     Min       1Q   Median       3Q      Max
-0.59048 -0.14858 -0.00747  0.16529  0.47052

Coefficients:
                       Estimate Std. Error t value Pr(>|t|)
(Intercept)           3.979e-01  2.244e-01   1.773  0.07801 .
GII                   3.112e-01  1.576e-01   1.975  0.04996 *
Total.fertility.rate  4.387e-02  1.951e-02   2.248  0.02588 *
Human.development    -5.191e-01  2.520e-01  -2.059  0.04101 *
GNI.person            4.259e-06  1.345e-06   3.165  0.00184 **
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.2084 on 166 degrees of freedom
  (5 observations deleted due to missingness)
Multiple R-squared:  0.325,     Adjusted R-squared:  0.3088
F-statistic: 19.99 on 4 and 166 DF,  p-value: 1.891e-13
```

```
> shapiro.test(new2.lm$resid)

        Shapiro-Wilk normality test

data:  new2.lm$resid
W = 0.98374, p-value = 0.04344


> bptest(new2.lm)

        studentized Breusch-Pagan test

data:  new2.lm
BP = 5.9089, df = 4, p-value = 0.2061


> dwtest(new2.lm)

        Durbin-Watson test

data:  new2.lm
DW = 1.6996, p-value = 0.02353
alternative hypothesis: true autocorrelation is greater than 0
```
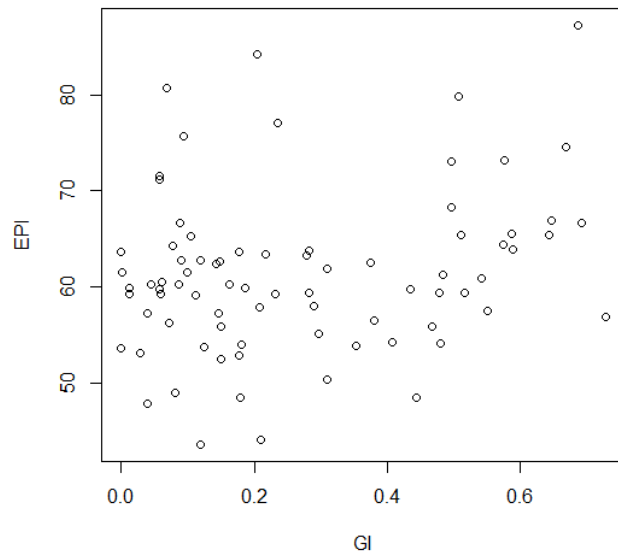
```
> LIF.lm2 <- lm(EL ~ GI)
> summary(LIF.lm2)

Call:
lm(formula = EL ~ GI)

Residuals:
    Min      1Q  Median      3Q     Max
-27.381  -3.610   1.640   5.415  17.233

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)   76.946      1.273  60.442  < 2e-16 ***
GI           -19.757      3.039  -6.501 1.75e-09 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 8.363 on 124 degrees of freedom
  (1 observation deleted due to missingness)
Multiple R-squared:  0.2542,    Adjusted R-squared:  0.2482
F-statistic: 42.27 on 1 and 124 DF,  p-value: 1.754e-09
```

```
> HDI.lm2 <- lm(Human.development ~ GI)
> summary(HDI.lm2)

Call:
lm(formula = Human.development ~ GI)

Residuals:
     Min       1Q   Median       3Q      Max
-0.39406 -0.08020  0.00452  0.10226  0.31061

Coefficients:
             Estimate Std. Error t value Pr(>|t|)
(Intercept)   0.79817    0.01857  42.980  < 2e-16 ***
GI           -0.29864    0.04298  -6.948 8.14e-11 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.1374 on 165 degrees of freedom
Multiple R-squared:  0.2264,    Adjusted R-squared:  0.2217
F-statistic: 48.28 on 1 and 165 DF,  p-value: 8.137e-11
```

```
> TFR.lm2 <- lm(TFR ~ GI)
> summary(TFR.lm2)

Call:
lm(formula = TFR ~ GI)

Residuals:
    Min      1Q  Median      3Q     Max
-2.3064 -0.9323 -0.2542  0.6834  4.9731

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)   1.7881     0.1878   9.521  < 2e-16 ***
GI            3.1028     0.4288   7.235 1.86e-11 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 1.348 on 159 degrees of freedom
Multiple R-squared:  0.2477,    Adjusted R-squared:  0.243
F-statistic: 52.35 on 1 and 159 DF,  p-value: 1.859e-11
```

```
> shapiro.test(LIF.lm2$resid)

        Shapiro-Wilk normality test

data:  LIF.lm2$resid
W = 0.94437, p-value = 5.644e-05

> bptest(LIF.lm2)

        studentized Breusch-Pagan test

data:  LIF.lm2
BP = 0.83858, df = 1, p-value = 0.3598

> dwtest(LIF.lm2)

        Durbin-Watson test

data:  LIF.lm2
DW = 1.9079, p-value = 0.3002
alternative hypothesis: true autocorrelation is greater than 0
```

```
.lm2$resid)

ilk normality test

sid
lue = 0.033

ed Breusch-Pagan test

= 1, p-value = 0.5562

son test

ue = 0.2281
hesis: true autocorrelation is greater than 0
```

```
apiro.test(TFR.lm2$resid)

        Shapiro-Wilk normality test

:  TFR.lm2$resid
0.93151, p-value = 5.841e-07

test(TFR.lm2)

        studentized Breusch-Pagan test

:  TFR.lm2
0.8854, df = 1, p-value = 0.3467

test(TFR.lm2)

        Durbin-Watson test

:  TFR.lm2
1.9489, p-value = 0.3687
rnative hypothesis: true autocorrelation is greater than 0
```
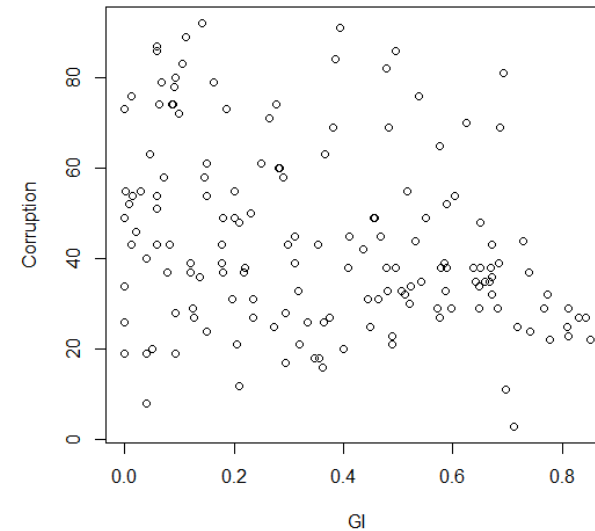
```
> cor.test(GI,EPI)

        Pearson's product-moment correlation

data:  GI and EPI
t = 2.2238, df = 77, p-value = 0.02909
alternative hypothesis: true correlation is not equal to 0
95 percent confidence interval:
 0.02596134 0.44272395
sample estimates:
      cor
0.2456616
```
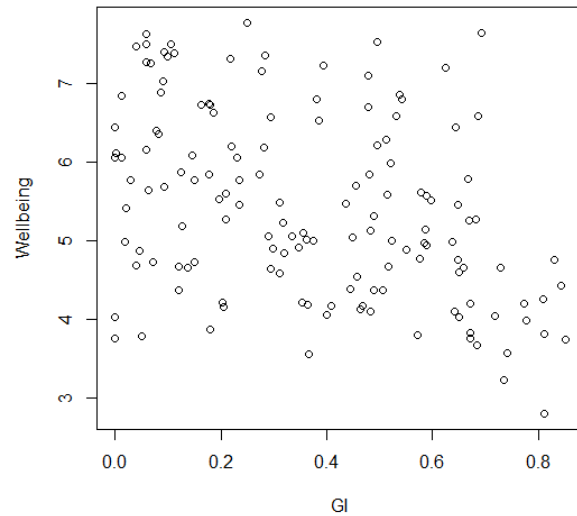
```
> cor.test(GI,Corruption)

        Pearson's product-moment correlation

data:  GI and Corruption
t = -3.8405, df = 155, p-value = 0.0001785
alternative hypothesis: true correlation is not equal to 0
95 percent confidence interval:
 -0.4314878 -0.1448212
sample estimates:
      cor
-0.2947726
```

Economic Participation Rate   World Corruption
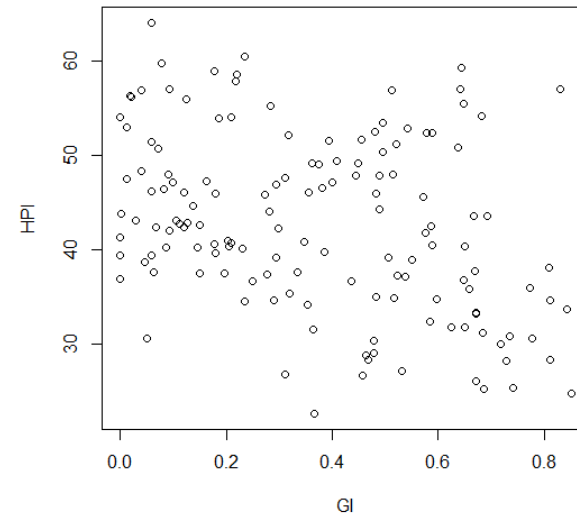
```
> cor.test(GI,Wellbeing)

        Pearson's product-moment correlation

data:  GI and Wellbeing
t = -5.195, df = 142, p-value = 6.972e-07
alternative hypothesis: true correlation is not equal to 0
95 percent confidence interval:
 -0.5286496 -0.2525659
sample estimates:
      cor
-0.3996316
```

```
> cor.test(GI,HPI)

        Pearson's product-moment correlation

data:  GI and HPI
t = -4.4691, df = 142, p-value = 1.594e-05
alternative hypothesis: true correlation is not equal to 0
95 percent confidence interval:
 -0.4867684 -0.1990076
sample estimates:
      cor
-0.3511525
```

Wellbeing   Happy Planet Index

If r = +.70 or higher Very strong positive relationship
+.40 to +.69 Strong positive relationship
+.30 to +.39 Moderate positive relationship
+.20 to +.29 weak positive relationship
+.01 to +.19 No or negligible relationship
-.01 to -.19 No or negligible relationship
-.20 to -.29 weak negative relationship
-.30 to -.39 Moderate negative relationship
-.40 to -.69 Strong negative relationship
-.70 or higher Very strong negative relationship

"Pearson's R Correlation – A Rule of Thumb." *Pearson's R Correlation – A Rule of Thumb*. N.p., n.d. Web. 14 July 2015.