PO12Q - Introduction to Quantitative Political Analysis II: Worksheet Week 2 - Solutions

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1 | Recoding

```
wdi <- wdi %>%
  mutate(politybin=
           ordered(
             cut(polity5, breaks=c(-11,1,11),
                 labels=c("Dictatorship","Democracy"))))

wdi <- wdi %>%
  mutate(gdpcat=
           ordered(
             cut(gdppc, breaks=c(0,3274.5, 189524),
                 labels=c("Developing","Developed"))))

wdi <- wdi %>%
  mutate(growth=
           ordered(
             cut(gdpgrowth, breaks=c(-Inf,279.417, Inf),
                 labels=c("slow-growing","fast-growing"))))
```

2 | Two-Sample Test of a Proportion

- Which proportion of developing and developed countries are democratic?
    - **developing=63.16%, developed=78.9%**
- Do we verify or falsify our hypothesis at a 95% confidence level?
    - **Yes, $p < 0.05$**

2.1 Exercises

- Is a higher proportion of fast-growing countries democratic than slow-growing countries? Use a 95% confidence level.

```
table(wdi$growth, wdi$democracy)
##
##                    0   1
##    slow-growing   60  70
##    fast-growing    7  41
```

```
prop.test(c(75,32),c(110,37), correct=F, alternative = "less")
##
##   2-sample test for equality of proportions without continuity correction
##
## data:  c(75, 32) out of c(110, 37)
## X-squared = 4.6837, df = 1, p-value = 0.01522
## alternative hypothesis: less
## 95 percent confidence interval:
##   -1.00000000 -0.06522477
## sample estimates:
##     prop 1    prop 2
## 0.6818182  0.8648649
```

```
################################################################
# Yes, they are: the p-value is small enough.
################################################################
```

3 | Two-Sample Test of Means

- Can we conclude at a 95% confidence level, that people live longer in developed countries than in developing countries?
  - **We can: the p-value is small enough, and the mean in the developing group is smaller than in the developed group**

3.1 Exercises

- Do people live longer under democracies than under dictatorahips? Use a 95% confidence level.

```
leveneTest(wdi$lifeexp ~ wdi$politybin)
## Levene's Test for Homogeneity of Variance (center = median)
##        Df F value Pr(>F)
## group   1  0.2372  0.627
##       151
```

```
################################################################
# This means we accept H0, and the variances are equal.
################################################################

t.test(lifeexp ~ politybin, data=wdi, var.equal = TRUE, alternative="less")
##
##   Two Sample t-test
##
## data:  lifeexp by politybin
## t = -2.1328, df = 151, p-value = 0.01728
## alternative hypothesis: true difference in means between group Dictatorship and group
    Democracy is less than 0
## 95 percent confidence interval:
##       -Inf -0.692887
## sample estimates:
## mean in group Dictatorship    mean in group Democracy
##                 68.85677                   71.94973
```

```
################################################################
# They do! The p-value is small.
################################################################
```