Perform Two-Sample Binomial Proportions Test in Python and R

http://mlwiki.org/index.php/Binomial_Proportion_Tests

- R: https://www.rdocumentation.org/packages/stats/versions/3.6.2/topics/prop.test
- Python https://www.statsmodels.org/stable/generated/statsmodels.stats.proportion.proportions_ztest.html

Python:

```
import numpy as np
from statsmodels.stats.proportion import proportions_ztest

x = np.array([0, 0, 0, 1, 1, 1, 0, 0, 1, 1, 1, 1, 1, 0, 0, 0])
y = np.array([0, 0, 0, 0, 1, 0, 1, 0, 0, 0, 0, 0, 1, 0, 0, 0])

proportions_ztest(count=[x.sum(), y.sum()], nobs=[x.shape[0], y.shape[0]])
tstat, p_val = proportions_ztest(count=[x.sum(), y.sum()], nobs=[x.shape[0], y.shape[0]])
print(tstat, p_val)

>1.8609684207969417 0.06274863637056455
```

R:

```
x = c(0, 0, 0, 1, 1, 1, 0, 0, 1, 1, 1, 1, 1, 0, 0, 0)
y = c(0, 0, 0, 0, 1, 0, 1, 0, 0, 0, 0, 0, 1, 0, 0, 0)

prop.test(c(sum(x), sum(y)), c(length(x), length(y)), correct=FALSE)

# Yates Continuity Correction can be too conservative: https://en.wikipedia.org/wiki/Yates%
27s_correction_for_continuity
> prop.test(c(sum(x), sum(y)), c(length(x), length(y)), correct=FALSE)

        2-sample test for equality of proportions without continuity
        correction

data:  c(sum(x), sum(y)) out of c(length(x), length(y))
X-squared = 3.4632, df = 1, p-value = 0.06275
alternative hypothesis: two.sided
95 percent confidence interval:
 0.001695907 0.623304093
sample estimates:
prop 1 prop 2
0.5000 0.1875
```