Untitled6

October 20, 2018

In [ ]:
```
#1. What is our independent variable? What is our dependent variable?

Independent variable: congruent or incongruent condition.
Dependent variable: Time taken to complete test.

#2. What is an appropriate set of hypotheses for this task? What kind of statistical t


Null Hypothesis, H0 - No change in time between two reading tasks (congruent or incongr
Alternate Hypothesis, H1 - incongruent task take more time than congruent.
H0: i | c (i - population mean of incongruent values, c - population mean of congruent

H1: i > c (i - population mean of incongruent values, c - population mean of congruent

statistical test dependent t-test (two tailed)

    We need to compare the means of two related groups to determine the statistically s
    We are assuming distributions are nearly normal and we are comparing 2 dependent sa
    our sample size less than 30 and we don't know the population standard deviations
```

In [1]:
```
#(3) Report some descriptive statistics regarding this dataset. Include at least one m
import math
import pandas as pd
import numpy as np
import seaborn as sns
import os
from scipy.stats import t
```

In [2]:
```
os.chdir("/home/raghusharma/Downloads")
df = pd.read_csv('stroopdata.csv')
print(df.mean(axis=0))
print(df.std(axis=0))
print("standard deviation for congruent {0:.2f}".format(np.std(df['Congruent'].values)
print("standard deviation for Incongruent {0:.2f}".format(np.std(df['Incongruent'].valu
```

```
Congruent      14.051125
Incongruent    22.015917
dtype: float64
```

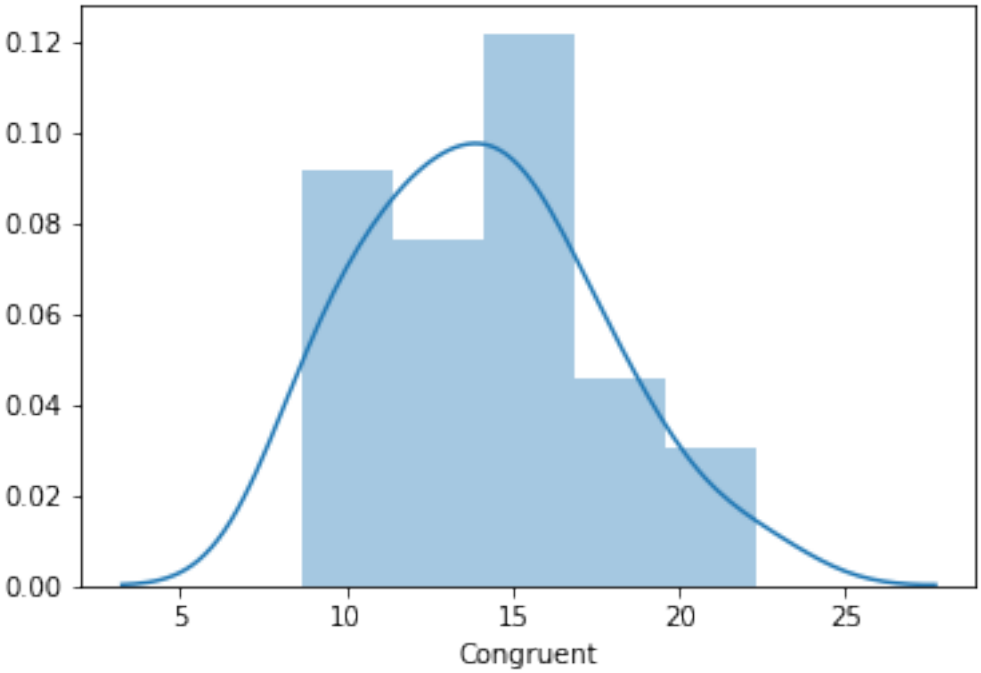
```
Congruent      3.559358
Incongruent    4.797057
dtype: float64
standard deviation for congruent 3.48
standard deviation for Incongruent 4.70
```

In [3]:
```
#(4) Provide one or two visualizations that show the distribution of the sample data.

        sns.distplot(df['Congruent'])
```

```
/home/raghusharma/anaconda3/lib/python3.6/site-packages/matplotlib/axes/_axes.py:6462: UserWarn
  warnings.warn("The 'normed' kwarg is deprecated, and has been "
```

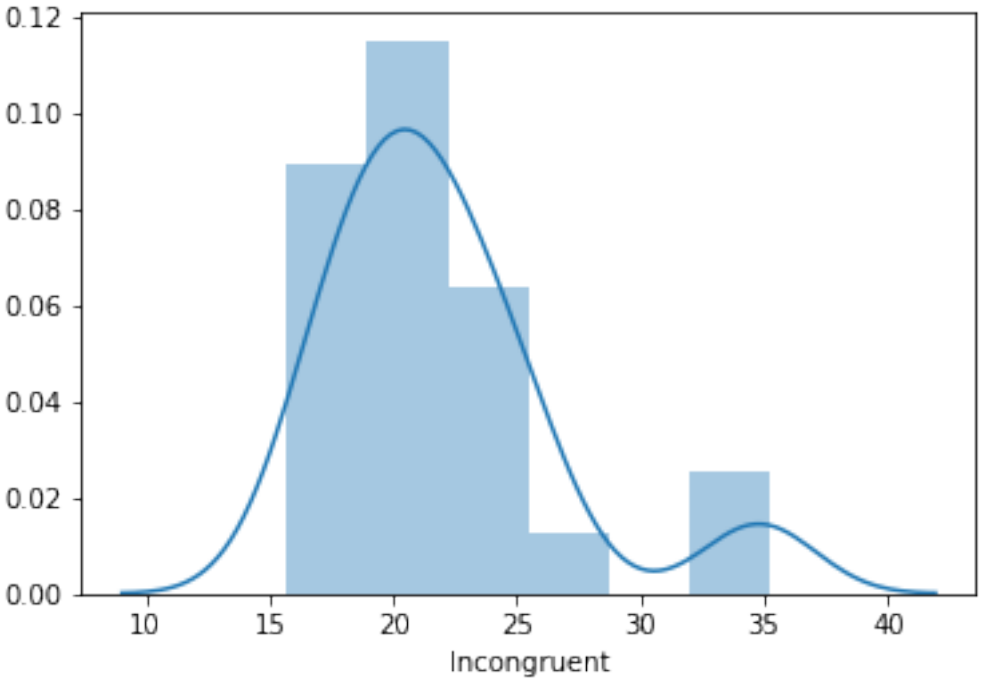
Out[3]: <matplotlib.axes._subplots.AxesSubplot at 0x7f631169b860>



In [4]:
```
sns.distplot(df['Incongruent'])
```

```
/home/raghusharma/anaconda3/lib/python3.6/site-packages/matplotlib/axes/_axes.py:6462: UserWarn
  warnings.warn("The 'normed' kwarg is deprecated, and has been "
```

Out[4]: <matplotlib.axes._subplots.AxesSubplot at 0x7f630d9abb38>



In [ ]: *#(5) Now, perform the statistical test and report the results. What is the confidence*

In [5]:
```
print(df['Congruent'].size)
print(df['Incongruent'].size)
```

```
24
24
```

In [9]:
```
t.ppf(.95, 23)
```

Out[9]: 1.7138715277470473

In [ ]: For a confidence level of 95% and 23 degrees of freedom, our t-critical value ends up l

Our point estimate for the difference of the means is: 22.02 - 14.05 = 7.97

Our standard deviation of the differences is calculated below.

In [10]:
```
df['Difference'] = df['Congruent'] - df['Incongruent']
print("standard deviation for congruent {0:.4f}".format(df['Difference'].std(axis=0)))
```

```
standard deviation for congruent 4.8648
```

In [11]:
```
7.97/(4.8648 / math.sqrt(24))
```

Out[11]: 8.025996238275749

In [ ]: Our t-statistic (8.02) is greater than our critical value (1.7139),So we can reject the
Which matches up with what we expected, That it takes much less time to do the congruen