

```
In [1]: from scipy import stats
        from scipy.stats import norm
```

```
In [2]: # Assume Null Hypothesis is:  $H_0 = \text{Avg Life of Bulb} \geq 260 \text{ days}$ 
        # Alternate Hypothesis is:  $H_a = \text{Avg Life of Bulb} < 260 \text{ days}$ 
```

```
In [3]: # find t-scores at  $x=260$ ;  $t=(s\_mean-P\_mean)/(s\_SD/\sqrt{n})$ 
        t=(260-270)/(90/18**0.5)
        t
```

```
Out[3]: -0.4714045207910317
```

```
In [4]: # Find  $P(X \geq 260)$  for null hypothesis
```

```
In [5]: #  $p\_value=1-\text{stats.t.cdf}(\text{abs}(t\_scores), df=n-1)$ ... Using cdf function
        p_value=1-stats.t.cdf(abs(-0.4714), df=17)
        p_value
```

```
Out[5]: 0.32167411684460556
```

```
In [6]: # OR  $p\_value=\text{stats.t.sf}(\text{abs}(t\_score), df=n-1)$ ... Using sf function
        p_value=stats.t.sf(abs(-0.4714), df=17)
        p_value
```

```
Out[6]: 0.32167411684460556
```

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In [ ]:
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