A battery manufacturer claims that their batteries last at least 500 hours on average. A quality control analyst believes that the actual average life of the batteries is less than 500 hours.

To test this claim, the analyst selects a random sample of 36 batteries, and finds that the sample mean lifetime is 485 hours, with a sample standard deviation of 20 hours.

At a 5% level of significance, test the analyst's claim using the p-value method. Assume battery lifetimes are approximately normally distributed.

Double-click (or enter) to edit

null hypothesis (ho):u=500 alternate hypothesis (h1):u<=500

```
import scipy.stats as stats

sample_mean=485
population_mean=500
n=36
level_of_significance=0.05
sample_sd = 20
df=df = n - 1

t_test=(sample_mean-population_mean)/(sample_sd/n**0.5)
t_test
```

```
-4.5
```

```
p_value=0.0000033975
```

```
if p_value<level_of_significance:
    print("reject null hypothesis")
else:
    print("accept null hypothesis")
```

```
reject null hypothesis
```

Double-click (or enter) to edit