

1. Calculate the 95% confidence interval for a sample mean of 40 and sample standard deviation of 40 with sample size equal to 100.

```
In [3]: import numpy as np
import pandas as pd

In [9]: x=40
sd=40
CI=95
alpha=0.05
n=100
z=1.96

In [11]: MOE=z*(sd/np.sqrt(n))

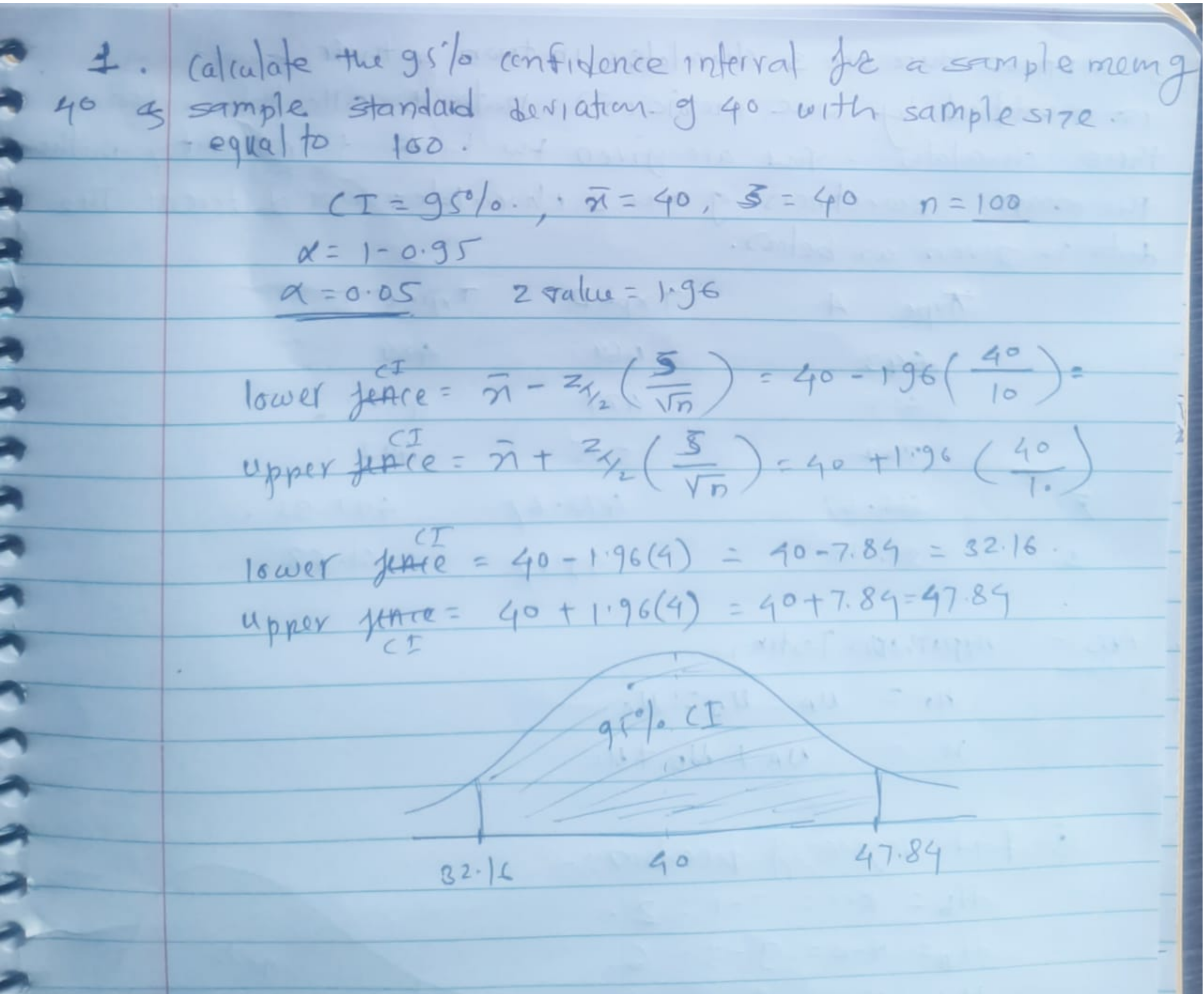
In [12]: MOE

Out[12]: 7.84

In [17]: lower_CI=x-MOE
upper_CI=x+MOE

In [18]: print(lower_CI)
print(x)
print(upper_CI)

32.16
40
47.84
```



2. A population has a mean weight of 68 kg. A random sample of size 25 has a mean weight of 70 with standard deviation =4. Identify whether this sample is representative of the population.

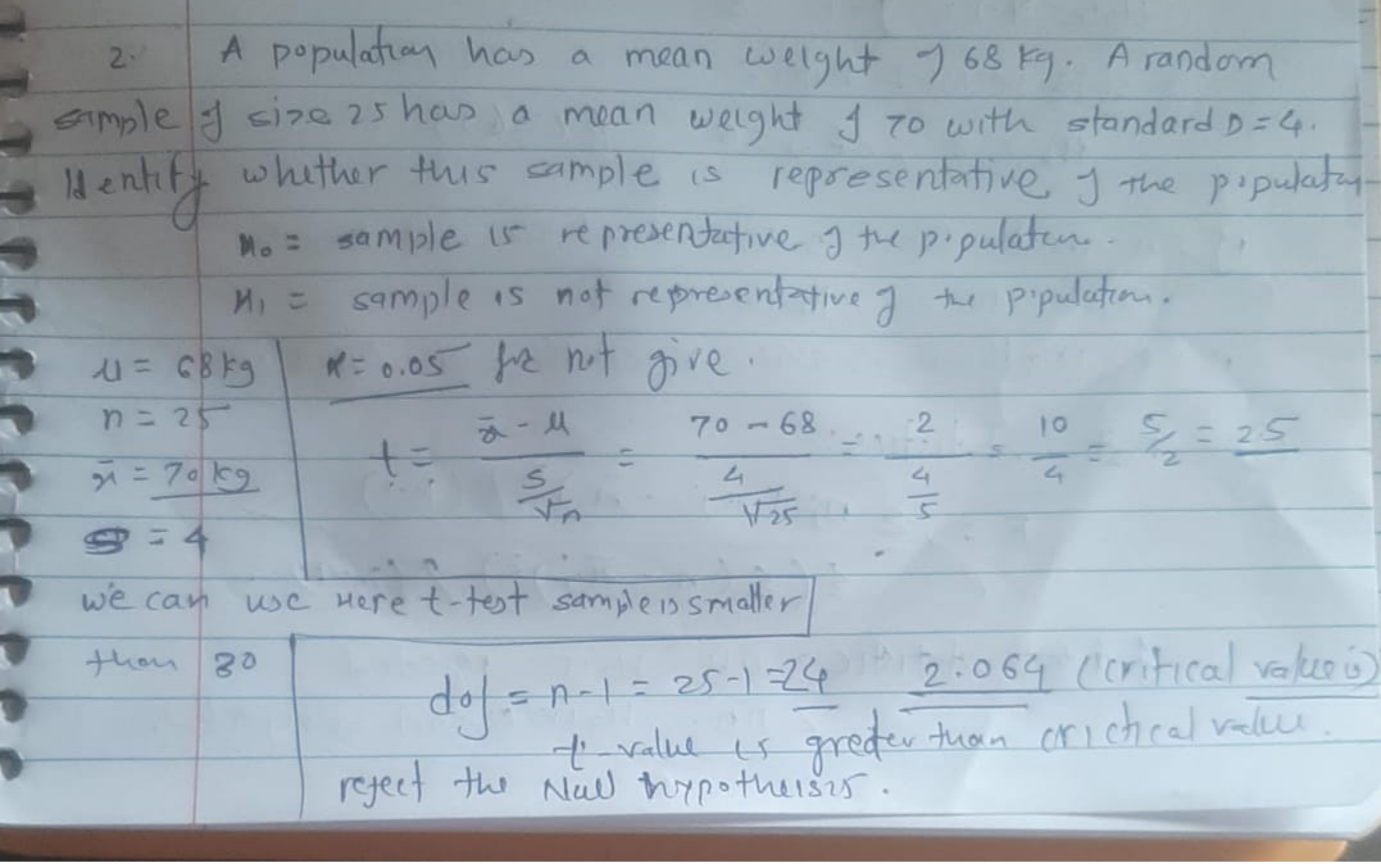
```
In [7]: u=68
n=25
x=70
SD=4

# H0= sample is representative of the population;
# H1=sample is not representative of the population;

In [8]: t=(x-u)/(SD/np.sqrt(n))
print(t)

2.5
```

- Critical value for for alpha=0.05 is 2.064
- t-value is greater than critical value so reject the null hypothesis.



3. Suppose there are 3 chocolates in town and their sweetness is quantified by some metric (S). Data is collected on the three chocolates. You are given the task to identify whether the mean sweetness of the 3 chocolates are different. The data is given as below:

