

HW 5

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Independent Two-Sample T Test

$$H_0 : \mu_w \leq \mu_{w/o}$$

$$H_A : \mu_w > \mu_{w/o}$$

Python

```
import scipy.stats as stats

withSurfactant = (39.3, 23.5, 37.7, 24.8, 33.9, 29.1)
withoutSurfactant = (32.1, 19.8, 32.9, 25.0, 35.4, 28.0)

tScore, pTwoTailed = stats.ttest_ind(withSurfactant, withoutSurfactant)

pOneTailed = pTwoTailed/2
print(f"\\textnormal{{{p-value}}} = {round(pOneTailed, 3)}\\")
```

p-value = 0.25

Conclusion

Since the p-value is much greater than α , we fail to reject the Null Hypothesis.

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Independent Two-Sample T Test

$$H_0 : \mu_A \leq \mu_B$$

$$H_A : \mu_A > \mu_B$$

Python

```
import scipy.stats as stats

medicine = {
    'A': (143, 148, 155, 125, 133, 138, 155, 144, 140, 143),
    'B': (135, 135, 140, 142, 121, 122, 120, 133, 131, 137)
}

_, p = stats.ttest_ind(medicine['A'], medicine['B'])

print(f"\\textnormal{{{p-value}}} = {round(p/2, 3)}\\")
```

p-value = 0.006

Conclusion

Since the p-value is less than α , we reject the Null Hypothesis.