Practice Problems 3D (updated version)

For #1-16, fill out the following table and write the formal conclusion. A "Low" P-value means that the P-value was lower than the significance level while a "High" P-value means that the P-value was higher than the significance level.

	Claim	P-value	Did Data meet Conditions/Assumptions for hypothesis test?	Reject the null hypothesis or Fail to reject the null hypothesis?	Formal Hypothesis Test Conclusion
1.	H_0	Low	Passed all conditions		
2.	H_0	Low	Failed some conditions		
3.	H_0	High	Passed all conditions		
4.	H_0	High	Failed some conditions		
5.	H_A	Low	Passed all conditions		
6.	H_A	Low	Failed some conditions		
7.	H_A	High	Passed all conditions		
8.	H_A	High	Failed some conditions		
9.	H_A	High	Failed some conditions		
10.	H_0	High	Failed some conditions		
11.	H_A	High	Passed all conditions		
12.	H_0	Low	Failed some conditions		
13.	H_A	Low	Failed some conditions		
14.	H_0	High	Passed all conditions		
15.	H_A	Low	Passed all conditions		
16.	H_0	Low	Passed all conditions		

17. The hospital claims that less than 4% of people who received the medication showed symptoms of side effects. The data passed all of the conditions for the hypothesis test. Use a 1% significance level. (P-value = 0.0027)

 Ho: $p \geq 0.04$
 Ha: $p < 0.04$ (Claim)

 a) Should we reject or fail to reject the null hypothesis? Explain why.

 b) Do we have statistical evidence for our conclusion? Explain why.

 c) Write the formal hypothesis test conclusion sentence addressing the claim and evidence.

 d) Explain your conclusion in non-statistics, easy to understand language.

18. We think that the population mean average height of women is at most 63.5 inches. Use a 5% significance level. The data passed all of the conditions for the hypothesis test. (P-value = 0.1843)

 Ho: $\mu \leq 63.5$ inches (Claim)
 Ha: $\mu > 63.5$ inches

 a) Should we reject or fail to reject the null hypothesis? Explain why.

 b) Do we have statistical evidence for our conclusion? Explain why.

 c) Write the formal hypothesis test conclusion sentence addressing the claim and evidence.

 d) Explain your conclusion in non-statistics, easy to understand language.

19. Latest polls suggest that the candidate should receive about 54% of the vote. Use a 10% significance level. The data did not pass all of the conditions for the hypothesis test. (P-value = 0.0711)

    Ho: p = 0.54 (Claim)
    Ha: p ≠ 0.54

    a) Should we reject or fail to reject the null hypothesis? Explain why.

    b) Do we have statistical evidence for our conclusion? Explain why.

    c) Write the formal hypothesis test conclusion sentence addressing the claim and evidence.

    d) Explain your conclusion in non-statistics, easy to understand language.

20. The population mean average weight of electrically powered car weighs is more than 2000 pounds. Use a 5% significance level. The data did not pass all of the conditions for the hypothesis test. (P-value = 0.2682)

    Ho: μ ≤ 2000 pounds
    Ha: μ > 2000 pounds (Claim)

    a) Should we reject or fail to reject the null hypothesis? Explain why.

    b) Do we have statistical evidence for our conclusion? Explain why.

    c) Write the formal hypothesis test conclusion sentence addressing the claim and evidence.

    d) Explain your conclusion in non-statistics, easy to understand language.

21. The medication Toprol is showing real promise in treating migraines. At least 50% of all patients taking Toprol have seen an improvement in their migraine symptoms. The data passed all of the conditions for the hypothesis test. Use a 1% significance level. (P-value = 0.0086)

    Ho: p ≥ 0.5 (Claim)
    Ha: p < 0.5

    a) Should we reject or fail to reject the null hypothesis? Explain why.

    b) Do we have statistical evidence for our conclusion? Explain why.

    c) Write the formal hypothesis test conclusion sentence addressing the claim and evidence.

    d) Explain your conclusion in non-statistics, easy to understand language.

22. The population mean average cholesterol for men is different from the population mean average cholesterol for women. The data passed all of the conditions for the hypothesis test. Use a 5% significance level. (P-value = 0.0391)

    Ho: μ1 = μ2
    Ha: μ1 ≠ μ2 (Claim)

    a) Should we reject or fail to reject the null hypothesis? Explain why.

    b) Do we have statistical evidence for our conclusion? Explain why.

    c) Write the formal hypothesis test conclusion sentence addressing the claim and evidence.

    d) Explain your conclusion in non-statistics, easy to understand language.

23. In this state, the population percentage of people that will vote for the democratic candidate will be higher than the percentage of people that will vote for the republican candidate. The data did NOT pass all of the conditions for the hypothesis test. Use a 10% significance level. (P-value = 0.3144)

   Ho: $p_1 \leq p_2$
   Ha: $p_1 > p_2$ (Claim)

   a) Should we reject or fail to reject the null hypothesis? Explain why.

   b) Do we have statistical evidence for our conclusion? Explain why.

   c) Write the formal hypothesis test conclusion sentence addressing the claim and evidence.

   d) Explain your conclusion in non-statistics, easy to understand language.