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Fall 2021  
  
 Telecom Unlimited Assignment

1. **Single Sample t-test**   
   • Number of items on primary card last month

**Step 1:**   
μ > 7 (Alternative)  
μ ≤ 7 (Null)  
H0: µ ≤ 7  
H1: µ > 7

**Step 2:** Right-tailed test

**Step 3: Decision Rule**

If tcalc > tcritical; Then reject H0

If tcalc < tcritical; Then Do Not reject H0

Where: tcritical = 1.645

Level of significance=α=.05

**Step 4: Calculate**  
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**Step 5: Conclusion**  
51.735 > 1.645; Then reject H0Conclude that the average number of items on the purchased last month is greater than 7.  
  
**How would you use this conclusion as a marketing** **manager?**  
As a marketing manager I would compare the items from last month to this month’s number of items. If last months is greater than this month, then I would run an offer to improve the number of items sold for this month.   
  
**What other statistical analysis could you conduct that would add insight to this analysis?**  
I would test to see how if this month’s sale was less than last month’s sales on the primary card.

• **Household income in thousands**   
**Step 1:**   
μ < 55 (Alternative)  
μ ≥ 55 (Null)  
H0: µ ≥ 55  
H1: µ < 55

**Step 2**: Left tailed test

**Step 3:** Decision Rule

If tcalc < tcritical; Then reject H0

If tcalc > tcritical; Then Do Not reject H0

Where: tcritical = -1.645

Level of significance=α=.05

**Step 4: Calculate**  
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Step 5: Conclusion

-.449 > -1.645; Then Do Not Reject H0Conclude that the household income in thousands is not less than 55.  
  
**How would you use this conclusion as a marketing** **manager?**  
If the household income is greater than $55K I would assume customers have more money to spend on more items. So, I would try to upsell or cross market to improve sales number.   
  
**What other statistical analysis could you conduct that would add insight to this analysis?**  
We can test whether the response rate for new offers is greater from customers that make more than $55K than the customers that make below $55K.

1. **Independent Sample t-test**   
   • **Response to offer/ Amount spent on primary card last month**   
     
   **Step 1:**   
   µ1 < µ2 (Alternative)  
   µ1 ≥ µ2 (Null)  
   H0: µ1 ≥ µ2 H1: µ1 < µ2Claim: Group 1 < Group 2  
   Respond < Did not respond  
     
   **Step 2:**  
   Left-tailed Test  
     
   **Step 3:**  
   If tcalc < tcritical; Then Reject H0  
   If tcalc > tcritical; Then Do Not Reject H0tcritical= -1.645  
     
   **Step 4:** Calculate

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**Step 5:** Conclusion

-1.780 < -1.645; Then Reject H0Conclude that the customers that did not respond to the latest promotion spent less on their primary card last month than customers who responded to the latest promotion offer.

**How would you use this conclusion as a marketing** **manager?**  
Since the customers that spent less are those that did not respond to the latest promotion, I would focus on nurturing the customers who responded to the latest promotion offer since they are more inclined to purchase items on their primary card.   
  
**What other statistical analysis could you conduct that would add insight to this analysis?**  
We can test whether males charged more than or equal to on the primary card than females in the population. We can check whether gender plays a role on purchases.

• **Response to offer/ Amount spent on wireless over tenure**   
**Step 1:**   
µ1 > µ2µ1 ≤ µ2    
H0: µ1 ≤ µ2 H1: µ1 > µ2Claim: Group 1 > Group 2  
Respond > Did not respond  
  
**Step 2:**  
Right-tailed Test  
  
**Step 3:**  
If tcalc > tcritical; Then Reject H0  
If tcalc < tcritical; Then Do Not Reject H0tcritical=1.645  
  
**Step 4:** Calculate  
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**Step 5:** Conclusion

2.520 > 1.645; Then Reject H0Conclude that the customers that did respond to the latest promotion spent more on the wireless over tenure than customers who did not respond to the latest promotion offer.  
  
**How would you use this conclusion as a marketing** **manager?**  
From a marketing manager perspective, the customers that stayed with the service and did not churn responded to the latest promotion. I would seek to focus on retaining the customers we already have then spend time acquiring new customers.   
  
**What other statistical analysis could you conduct that would add insight to this analysis?**  
We can test whether the household income is greater for customers that respond to the promotional offer than customers that did not respond to the offer. This could let us see if purchases are affected by the customers income level.

1. **Paired Samples t-test   
   • Number of items on primary card last month/ Number of items on secondary card last month**  
     
   **Step 1:**   
   µ1 > µ2 (Alternative) µ1 ≤ µ2  (Null)   
   H0: µ1 ≤ µ2 H1: µ1 > µ2Claim: Variable 1 mean > Variable 2 mean  
   Number of items on primary card last month > Number of items on secondary card last month  
     
   **Step 2:**  
   Right-tailed Test  
     
   **Step 3:**  
   If tcalc > tcritical; Then Reject H0  
   If tcalc < tcritical; Then Do Not Reject H0tcritical=1.645  
     
   **Step 4:** Calculate  
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   **Step 5:** Conclusion  
   75.173 > 1.645; Reject H0  
   Conclude the number of items on primary card last month is greater than the number of items on secondary card last month  
     
   **How would you use this conclusion as a marketing** **manager?**  
   I would target customers that use their primary card as they purchase more items.   
     
   **What other statistical analysis could you conduct that would add insight to this analysis?**  
   We can test to see how customers that use their primary card respond to offers before and after a promotion to see if customers are motivated to purchase more items on because of a sale.

**• Amount spent on wireless over tenure/ Amount spent calling card over tenure**

**Step 1:**   
µ1 < µ2 (Alternative)  
µ1 ≥ µ2 (Null)H0: µ1 ≥ µ2 H1: µ1 < µ2Claim: Variable 1 mean < Variable 2 mean  
Amount spent on wireless over tenure < Amount spent on calling card over tenure  
  
**Step 2:**  
Left-tailed Test  
  
**Step 3:**  
If tcalc < tcritical; Then Reject H0  
If tcalc > tcritical; Then Do Not Reject H0tcritical= -1.645  
  
**Step 4:** Calculate  
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**Step 5:** Conclusion  
-13.334 < -1.645; Then Reject H0  
Conclude the amount spent on wireless over tenure is less than the amount spent on calling card over tenure

**How would you use this conclusion as a marketing** **manager?**  
I would create an email or print campaign targeted to customers that purchase calling cards over tenure since they spend more.

**What other statistical analysis could you conduct that would add insight to this analysis?**  
We can test to see how male, and females amount spent on calling cards over tenure. We can test to see if male spent more on calling cards than women.