Hypothesis test for single proportion via CLT

Soda taste test example

Some people claim they can tell the difference between a diet soda and a regular soda in the first sip. A researcher wanted to test this claim using a hypothesis test at the 0.05 significance level.

- He randomly sampled 80 people.
- He then filled 80 plain white cups with soda, half diet and half regular through random assignment, and asked each person to take one sip from their cup and identify the soda as diet or regular.
- 53 participants correctly identified the soda.

Let p be the proportion of people who correctly identify soda type.

$\begin{array}{c} \textbf{Step 1} \\ H_0: \end{array}$

 $H_A:$

Step 2

Calculate useful summary information and set α

Step 3

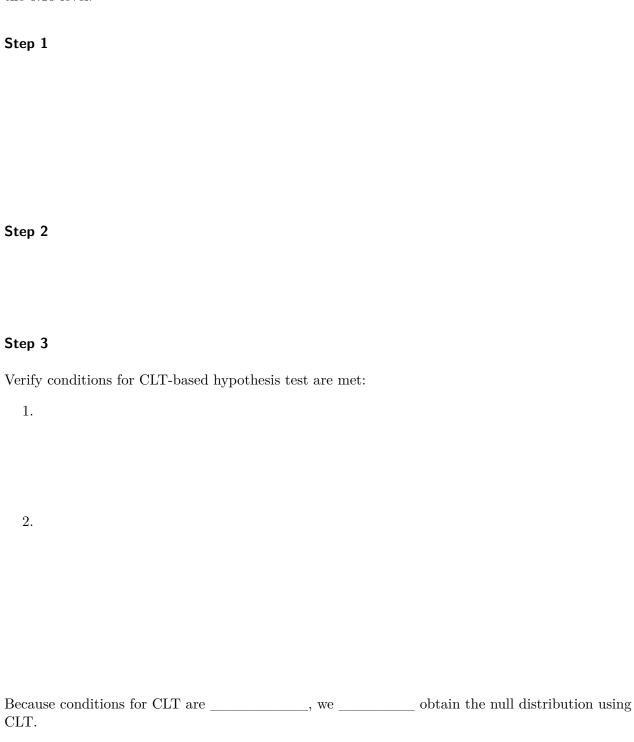
Find null distribution of \hat{p} via CLT.

• Check conditions:

Because conditions for CLT areCLT.	, we	obtain the null distribution using
• Obtain null distribution of \hat{p} :		
To find p-value:		
• Calculate our observed test statistic:		
= 1	$\frac{\text{point est.} - \text{null }}{\text{SE}_0}$	value
Calculate p-value		
- Draw a picture of a Normal dis- statement in the form of $P()$ the		shade in the correct area. Write out a at we want to find.
- Write R code that corresponds t	o the probability	of interest
Step 4		
Decision:		
Conclusion:		

M&Ms example

M&M's reported that 14% of its candies are yellow. We are interested in testing this claim. In a random sample of 100 M&M's, 9 were found to be yellow. Conduct a hypothesis test via CLT at the 0.10 level.



• Null distribution:
To find p-value:
• Calculate our observed test statistic
 Calculate p-value Draw a picture of a Normal distribution, and shade in the correct area
Draw a prevare of a reormal distribution, and shade in the correct area
$-$ Write probability statement and ${\tt R}$ code that corresponds to the probability of interest
Step 4
Decision:
Conclusion: