1) **Supplemented Medicare.** A 1999 General Accounting Office (GAO) study found that about a third of the 23.4 million retirees 65 or older supplemented Medicare with some form of employer coverage (Carlos Tejada, "Work Week", Wall Street Journal, June 26, 2002, B5). The article suggests that this proportion is increasing. Suppose that in a current study, a random sample of 500 retirees 65 or older indicated that 185 supplemented Medicare with some form of employer coverage.
At the 0.01 level of significance, is there evidence that the proportion of retirees 65 or older that supplement Medicare with some form of employer coverage is now greater than one-third? Compute the p-value and interpret its meaning.

2) **Waiting Time.** A bank branch located in a commercial district of a city has developed an improved process for serving customers during the noon to 1:00 P.M., peak lunch period. The waiting time (defined as the time the customer enters the line until he or she is served) of a random sample of 14 customers during hour is recorded over a period of 1 week and the results follows: (dataset: `waiting.time.txt`)
At the 0.05 level of significance, is there evidence that the mean waiting time is less than 5 minutes?

3) **Robots.** Scientists think that robots will play a crucial role in factories in the next several decades. Suppose that in an experiment to determine whether the use of robots to weave computer cables is feasible, a robot was used to assemble 500 cables. The cables were examined and there were 10 defectives. If human assemblers have a defect rate of .035 (3.5%), does this data support the hypothesis that the proportion of defectives is lower for robots than for humans?
Use a $\alpha = .05$ significance level. Determine the type of possible error.

4) **Resolution of Complaints.** One of the major measures of the quality of service provided by an organization is the speed with which it responds to customer complaints. A large family-held store that sells furniture and flooring, including carpet, had undergone a major expansion in the past several years. In particular, the flooring department had expanded from two installation crews to an installation supervisor, a measurer, and 15 installation crews. A sample of 50 complaints in a recent year concerning carpet installation was selected. The data `resolution.txt` represent the number of days between the receipt of the complaint and the resolution of the complaint.
Suppose a customer calls the store with a complaint after the carpet has been installed. She asks the flooring department manager how long she can expect to wait to have her complaint resolved. The flooring department manager replies, "Almost certainly not longer than 30 days." Evaluate this statement ($\alpha = 5\%$).

5) Policy Approval. In New York State, savings banks are permitted to sell a life insurance called Savings Bank Life Insurance (SBLI). The approval process consists of underwriting, which includes a review of the application, a medical information bureau check, possible requests for additional medical information and medical exams, and a policy compilation stage in which the policy pages are generated and sent to the bank for delivery. The ability to deliver approved policies to customers in a timely manner is critical to the profitability of this service to the bank. During a period of 1 month, a random sample of 27 approved policies was selected and the total processing time in days was recorded.
(dataset: `policy.txt`)
Suppose a customer calls the bank and asks how long he can expect to wait before the policy is approved. The bank manager replies, "About 35 days." Evaluate this statement ($\alpha = 5\%$)..

6) Batteries. A manufacturer of nickel-hydrogen batteries randomly selects 100 nickel plates for test cells, cycles them a specified number of times, and determines that 14 of the plates have blistered. Does this provide compelling evidence for concluding that more than 10% of all plates blister under such circumstances? State and test the appropriate hypotheses using a significance level of $\alpha = 0.05$.
In reaching your conclusion, what type of error might you have committed?

7) Electrical Insulators. A manufacturing company produces electrical insulators. If the insulators break when in use, a short circuit is likely to occur. To test the strength of the insulators, destructive testing is carried out in high-powered labs to determine how much force is required to break the insulators. Force is measured by observing how many pounds must be applied to the insulator before it breaks. The dataset `force.txt` contains data from 30 observations in this experiment.
Force: number of pounds required to break the insulator
At the 0.05 level of significance, is there evidence that the mean force is
a) equal to 1,500 pounds?
b) greater than 1,500 pounds?
What assumption must hold in order to perform the tests in a and b?