1. An admission charge for the Little Rep Theater varies according to the age of the person. Develop a solution to print the ticket charge given the age of the person. The charges are as follows:

Over 55	$7
13-54	$10
3-12	$5
Under 3	Free

2. A customer needs a specific amount of paper. The charges on the paper are $0.10 for single sheets, $0.055 for amounts in multiples of 100 sheets, $0.04 in multiples of 500 sheets, and $0.03 for multiples of 1000 sheets. Develop a solution to calculate the type and number of packages for the least amount of money the customer should buy, given the minimum amount of sheets that the customer needs. For example, if the customer needs 380 sheets, the amount the customer would pay when buying in multiples of 100 would be $22. However, if the customer bought 500 sheets, the cost would be $20. It would be cost effective for the customer to buy a package of 500 sheets.

3. A hotel has a pricing as follows:

2 people	$85
3 people	$90
4 people	$95
Additional people	$6 per person

If the customer is staying on company business, there is a 20% discount. If the customer is over 60 years of age, there is a 15% discount. A customer does not receive both discounts. Given the above data, print the cost of the room.

4. Write a computer program that computes the duration of a projectile's flight and its height when it reaches the target.

Program Constant:

g   32.17   /* Gravitional constant */

Program inputs

double theta   /* angle of elevation */

double distance   /* distance to target */

double velocity   /* projectile velocity in ft/sec */

Program outputs

     double time   /* time of flight */

     double height   /* height at impact */

Relevant Formulas

$$Time = \frac{Distance}{velocity \times cos(theta)}$$

$$Height = velocity \times sin(theta) \times time - \frac{g \times time^2}{2}$$

5. Los Angeles sometimes has very smoggy conditions. These conditions are largely due to L.A.'s location between mountain ranges, coupled with prevailing winds off the ocean that tend to blow pollutants from the city's many automobiles up against the mountains. Three components of smog—ozone, nitrogen oxide, and carbon monoxide—are particular health concern. A pollutant hazard index has been developed for each of the three primary irritants. If any index rises above 100, the air is listed as *"unhealthful"* in forecasts to Los Angeles residents. If the index for anyone rises above 200, a *"first-stage smog alert"* is issued and certain activities are restricted in the affected part of the Los Angeles basin. If an index goes over 275, a *"second-stage smog alert"* is called and more severe restrictions apply. Develop a solution to solve the above problem.

6. Develop a solution to solve the following problem. A university uses three criteria to determine if a first year student athlete is eligible to play a sport during the first semester of college. Only two of the three criteria must be met to be eligible. The criteria are:
   a. Athletes must score 18 or higher on the ACT.
   b. Athletes must graduate in the top half of their high school class.
   c. Athletes must have a GPA of 2.0 or higher.