Programming Challenges

1. Sum of Two Numbers

Write a program that stores the integers 50 and 100 in variables and stores the sum of these two in a variable named `total`. Display the total on the screen.

2. Sales Prediction

The East Coast sales division of a company generates 58 percent of total sales. Based on that percentage, write a program that will predict how much the East Coast division will generate if the company has $8.6 million in sales this year. Display the result on the screen.

3. Sales Tax

Write a program that computes the total sales tax on a $95 purchase. Assume the state sales tax is 6.5 percent and the county sales tax is 2 percent. Display the purchase price, state tax, county tax, and total tax amounts on the screen.

4. Restaurant Bill

Write a program that computes the tax and tip on a restaurant bill for a patron with a $44.50 meal charge. The tax should be 6.75 percent of the meal cost. The tip should be 15 percent of the total after adding the tax. Display the meal cost, tax amount, tip amount, and total bill on the screen.

VideoNote
Solving the Restaurant Bill Problem

5. Miles per Gallon

A car holds 16 gallons of gasoline and can travel 312 miles before refueling. Write a program that calculates the number of miles per gallon the car gets. Display the result on the screen.

6. Distance per Tank of Gas

A car with a 20 gallon gas tank averages 23.5 miles per gallon when driven in town and 28.9 miles per gallon when driven on the highway. Write a program that calculates and displays the distance the car can travel on one tank of gas when driven in town and when driven on the highway.

7. Number of Acres

One acre of land is equivalent to 43,450 square feet. Write a program that calculates and displays the number of acres in a tract of land whose size is 869×360 feet.

8. Land Calculation

In the United States, land is often measured in square feet. In many other countries, it is measured in square meters. One acre of land is equivalent to 43,560 square feet. A square meter is equivalent to 10.7639 square feet. Write a program that computes and displays the number of square feet and the number of square meters in $\frac{1}{2}$ acre of land.

Hint: Because a square meter is larger than a square foot, there will be fewer square meters in $\frac{1}{2}$ acre than there are square feet.

9. Circuit Board Price

An electronics company makes circuit boards that cost $14.95 apiece to produce. Write a program to determine how much the company should sell them for if it wants to make a 35 percent profit. Display the result on the screen.

10. Personal Information

Write a program that displays the following information, each on a separate line:

Your name
Your address, with city, state, and zip code
Your telephone number
Your college major

Use only a single cout statement to display all of this information.

11. Triangle Pattern

Write a program that displays the following pattern on the screen:

```
*
***
*****
*******
```

12. Diamond Pattern

Write a program that displays the following pattern on the screen:

```
*
***
*****
*******
*****
***
*
```

13. Pay Period Gross Pay

A particular employee earns $39,000 annually. Write a program that determines and displays what the amount of his gross pay will be for each pay period if he is paid twice a month (24 pay checks per year) and if he is paid bi-weekly (26 checks per year).

14. Basketball Player Height

The star player of a high school basketball team is 74 inches tall. Write a program to compute and display the height in feet/inches form.

Hint: Try using the modulus and integer divide operations.

15. Stock Loss

Kathryn bought 750 shares of stock at a price of $35.00 per share. A year later she sold them for just $31.15 per share. Write a program that calculates and displays the following:

- The total amount paid for the stock.
- The total amount received from selling the stock.
- The total amount of money she lost.

16. Energy Drink Consumption

A soft drink company recently surveyed 16,500 of its customers and found that approximately 15 percent of those surveyed purchase one or more energy drinks per week. Of those customers who purchase energy drinks, approximately 52 percent of them purchase citrus flavored energy drinks. Write a program that displays the following:

- The approximate number of customers in the survey who purchase one or more energy drinks per week.
- The approximate number of customers in the survey who purchase citrus flavored energy drinks.

17. Past Ocean Levels

The Earth's ocean levels have risen an average of 1.8 millimeters per year over the past century. Write a program that computes and displays the number of centimeters and number of inches the oceans rose during this time. One millimeter is equivalent to 0.1 centimeters. One centimeter is equivalent to 0.3937 inches.

18. Future Ocean Levels

During the past decade ocean levels have been rising faster than in the past, an average of approximately 3.1 millimeters per year. Write a program that computes how much ocean levels are expected to rise during the next 15 years if they continue rising at this rate. Display the answer in both centimeters and inches.

19. Annual High Temperatures

The average July high temperature is 85 degrees Fahrenheit in New York City, 88 degrees in Denver, and 106 degrees in Pheonix. Write a program that calculates and reports what the new average high July temperature would be for each of these cities if temperatures to rise by 2 percent.

20. How Much Paint

A particular brand of paint covers 340 square feet per gallon. Write a program to determine and report approximately how many gallons of paint will be needed to paint two coats on a wooden fence that is 6 feet high and 100 feet long.