

6. Distance Traveled

The distance a vehicle travels can be calculated as follows:

$$\text{distance} = \text{speed} * \text{time}$$

For example, if a train travels 40 miles per hour for 3 hours, the distance traveled is 120 miles.

Write a program that asks the user for the speed of a vehicle (in miles per hour) and how many hours it has traveled. The program should then use a loop to display the distance the vehicle has traveled for each hour of that time period. Here is an example of the output:

```
What is the speed of the vehicle in mph? 40
How many hours has it traveled? 3
Hour Distance Traveled
-----
1           40
2           80
3          120
```

Input Validation: Do not accept a negative number for speed and do not accept any value less than 1 for time traveled.

7. Pennies for Pay

Write a program that calculates how much a person would earn over a period of time if his or her salary is one penny the first day and two pennies the second day, and continues to double each day. The program should ask the user for the number of days. Display a table showing how much the salary was for each day, and then show the total pay at the end of the period. The output should be displayed in a dollar amount, not the number of pennies.

Input Validation: Do not accept a number less than 1 for the number of days worked.

8. Math Tutor

This program started in Programming Challenge 17, of Chapter 3, and was modified in Programming Challenge 11 of Chapter 4. Modify the program again so it displays a menu allowing the user to select an addition, subtraction, multiplication, or division problem. The final selection on the menu should let the user quit the program. After the user has finished the math problem, the program should display the menu again. This process is repeated until the user chooses to quit the program.

Input Validation: If the user selects an item not on the menu, display an error message and display the menu again.

9. Hotel Occupancy

Write a program that calculates the occupancy rate for a hotel. The program should start by asking the user how many floors the hotel has. A loop should then iterate once for each floor. In each iteration, the loop should ask the user for the number of rooms on the floor and how many of them are occupied. After all the iterations, the program should display how many rooms the hotel has, how many of them are occupied, how many are unoccupied, and the percentage of rooms that are occupied. The percentage may be calculated by dividing the number of rooms occupied by the number of rooms.



NOTE: It is traditional that most hotels do not have a thirteenth floor. The loop in this program should skip the entire thirteenth iteration.