Programming Exercises using decision

1. **Day of the Week**
   Write a program that asks the user for a number in the range of 1 through 7. The program should display the corresponding day of the week, where 1 = Monday, 2 = Tuesday, 3 = Wednesday, 4 = Thursday, 5 = Friday, 6 = Saturday, and 7 = Sunday. The program should display an error message if the user enters a number that is outside the range of 1 through 7.
2. **Areas of Rectangles**
   The area of a rectangle is the rectangle's length times its width. Write a program that asks for the length and width of two rectangles. The program should tell the user which rectangle has the greater area, or if the areas are the same.
3. **Age Classifier**
   Write a program that asks the user to enter a person's age. The program should display a message indicating whether the person is an infant, a child, a teenager, or an adult.
   Following are the guidelines:
   • If the person is 1 year old or less, he or she is an infant.
   • If the person is older than 1 year, but younger than 13 years, he or she is a child.
   • If the person is at least 13 years old, but less than 20 years old, he or she is a teenager.
   • If the person is at least 20 years old, he or she is an adult.
4. **Roman Numerals**
   Write a program that prompts the user to enter a number within the range of 1 through 10. The program should display the Roman numeral version of that number. If the number is outside the range of 1 through 10, the program should display an error message. The following table shows the Roman numerals for the numbers 1 through 10:

Number	**Roman Numeral**
1	I
2	II
3	III
4	IV
5	V
6	VI
7	VII
8	VIII
9	IX
10	X

5. **Areas of Rectangles**
   The area of a rectangle is the rectangle's length times its width. Write a program that asks for the length and width of two rectangles. The

program should tell the user which rectangle has the greater area, or if the areas are the same.

6. **Mass and Weight**

Scientists measure an object's mass in kilograms and its weight in newtons. If you know the amount of mass of an object in kilograms, you can calculate its weight in newtons with the following formula:

weight = mass / 9.8

Write a program that asks the user to enter an object's mass, and then calculates its weight. If the object weighs more than 1,000 newtons, display a message indicating that it is too heavy. If the object weighs less than 10 newtons, display a message indicating that it is too light.

7. **Magic Dates**

The date June 10, 1960, is special because when it is written in the following format, the month times the day equals the year: 6/10/60

Design a program that asks the user to enter a month (in numeric form), a day, and a two digit year. The program should then determine whether the month times the day equals the year. If so, it should display a message saying the date is magic. Otherwise, it should display a message saying the date is not magic.

8. **Color Mixer**

The colors red, blue, and yellow are known as the primary colors because they cannot be made by mixing other colors. When you mix two primary colors, you get a secondary color, as shown here:

When you mix red and blue, you get purple.

When you mix red and yellow, you get orange.

When you mix blue and yellow, you get green.

Design a program that prompts the user to enter the names of two primary colors to mix. If the user enters anything other than "red," "blue," or "yellow," the program should display an error message. Otherwise, the program should display the name of the secondary color that results.

9. **Change for a Dollar Game**

Create a change-counting game that gets the user to enter the number of coins required to make exactly one dollar. The program should prompt the user to enter the number of pennies, nickels, dimes, and quarters. If the total value of the coins entered is equal to one dollar, the program should congratulate the user for winning the game. Otherwise, the program should display a message indicating whether the amount entered was more than or less than one dollar.

10. **Book Club Points**

Serendipity Booksellers has a book club that awards points to its customers based on the number of books purchased each month. The points are awarded as follows:

- If a customer purchases 0 books, he or she earns 0 points.
- If a customer purchases 1 book, he or she earns 5 points.
- If a customer purchases 2 books, he or she earns 15 points.

• If a customer purchases 3 books, he or she earns 30 points.
• If a customer purchases 4 or more books, he or she earns 60 points.

Write a program that asks the user to enter the number of books that he or she has purchased this month and displays the number of points awarded.

11. Software Sales

A software company sells a package that retails for $99. Quantity discounts are given according to the following table:

Quantity	Discount
10–19	20%
20–49	30%
50–99	40%
100 or more	50%

Write a program that asks the user to enter the number of packages purchased. The program should then display the amount of the discount (if any) and the total amount of the purchase after the discount.

12. Shipping Charges

The Fast Freight Shipping Company charges the following rates:

Weight of Package	Rate per Pound
2 pounds or less	$1.10
Over 2 pounds but not more than 6 pounds	$2.20
Over 6 pounds but not more than 10 pounds	$3.70
Over 10 pounds	$3.80

Write a program that asks the user to enter the weight of a package and then displays the shipping charges.

13. Body Mass Index Program Enhancement

In programming Exercise #6 in Chapter 3 you were asked to write a program that calculates a person's body mass index (BMI). Recall from that exercise that the BMI is often used to determine whether a person is overweight or underweight for their height. A person's BMI is calculated with the formula

$BMI = weight * 703 / height^2$

where weight is measured in pounds and height is measured in inches. Enhance the program so it displays a message indicating whether the person has optimal weight, is underweight, or is overweight. A person's weight is considered to be optimal if his or her BMI is between 18.5 and 25. If the BMI is less than 18.5, the person is considered to be underweight. If the BMI value is greater than 25, the person is considered to be overweight.

14. Time Calculator

Write a program that asks the user to enter a number of seconds, and works as follows:

• There are 60 seconds in a minute. If the number of seconds entered by the user is greater than or equal to 60, the program should display the number of minutes in that many seconds.
• There are 3,600 seconds in an hour. If the number of seconds entered by the user is greater than or equal to 3,600, the program should display the number of hours in that many seconds.
• There are 86,400 seconds in a day. If the number of seconds entered by the user is greater than or equal to 86,400, the program should display the number of days in that many seconds.

15. Roulette Wheel Colors

On a roulette wheel, the pockets are numbered from 0 to 36. The colors of the pockets are as follows:
• Pocket 0 is green.
• For pockets 1 through 10, the odd-numbered pockets are red and the even-numbered
pockets are black.
• For pockets 11 through 18, the odd-numbered pockets are black and the even-numbered pockets are red.
• For pockets 19 through 28, the odd-numbered pockets are red and the even-numbered pockets are black.
• For pockets 29 through 36, the odd-numbered pockets are black and the even numbered pockets are red.
Write a program that asks the user to enter a pocket number and displays whether the
pocket is green, red, or black. The program should display an error message if the user
enters a number that is outside the range of 0 through 36.