

1. Define a structure called "person" that contains the fields "name" (string), "age" (integer), and "height" (float). Write a program that creates a person and prints their information to the console.
2. Define a union called "my\_union" that contains the fields "integer" (integer) and "floating\_point" (float). Write a program that creates a union and assigns values to both fields, and then prints out the value of the union.
3. Define a structure called "book" that contains the fields "title" (string), "author" (string), and "price" (float). Write a program that creates an array of 5 books, prompts the user to enter the information for each book, and then prints out the information for each book.
4. Define a union called "my\_data" that contains the fields "integer" (integer) and "floating\_point" (float). Write a program that reads in a value from the user and determines whether it is an integer or a floating-point number, and then stores the value in the appropriate field of the union.
5. Define a structure called "rectangle" that contains the fields "width" (float) and "height" (float). Write a program that creates a rectangle, prompts the user to enter the width and height, and then calculates and prints out the area of the rectangle.
6. Define a union called "my\_union" that contains the fields "integer" (integer) and "string" (string). Write a program that prompts the user to enter a value, and then determines whether it is an integer or a string and stores it in the appropriate field of the union.
7. Define a structure called "employee" that contains the fields "name" (string), "salary" (float), and "age" (integer). Write a program that creates an array of 3 employees, prompts the user to enter the information for each employee, and then prints out the information for each employee.
8. Define a union called "my\_data" that contains the fields "integer" (integer), "floating\_point" (float), and "string" (string). Write a program that prompts the user to enter a value, and then determines whether it is an integer, a floating-point number, or a string and stores it in the appropriate field of the union.

9. Define a structure called "point" that contains the fields "x" (float) and "y" (float). Write a program that creates two points, prompts the user to enter the coordinates for each point, and then calculates and prints out the distance between the two points.
10. Define a union called "my\_union" that contains the fields "integer" (integer) and "floating\_point" (float). Write a program that creates an array of 5 unions, prompts the user to enter a value for each union, and then calculates and prints out the total of all the values in the unions (using the appropriate type conversion).
11. Create a structure called "student" that contains the following fields: name (string), id (integer), and gpa (float).
12. Write a program that uses the "student" structure to store information about three students. Prompt the user to enter the name, id, and gpa for each student, and then display the information for all three students.
13. Create a program that defines a structure called "book" which has the following fields: title (string), author (string), publication year (integer), and price (float). Write a function that accepts an array of "book" structures and displays the information for all books with a publication year greater than 2010.
14. Define a structure called "rectangle" that contains the fields "length" (integer) and "width" (integer). Write a function that accepts a "rectangle" structure as a parameter and returns the area of the rectangle.
15. Create a program that defines a structure called "employee" which has the following fields: name (string), age (integer), salary (float), and department (string). Write a function that accepts an array of "employee" structures and displays the information for all employees who work in the "Sales" department and earn a salary greater than \$50,000 per year.
16. Write a program that creates an array of "person" structures with three elements. Prompt the user to enter the name, age, and address for each person, and then display the information for all three people.
17. Define a structure called "song" with the fields "title" (string), "artist" (string), "album" (string), and "year" (integer). Write a function called "print\_song" that accepts a "song" structure as a parameter and displays the information for that song in the following format: "Title: [title], Artist: [artist], Album: [album], Year: [year]".

18. Define a structure called "circle" that contains the fields "radius" (float) and "center" (a "point" structure with fields "x" and "y" coordinates as integers). Write a function called "area\_of\_circle" that accepts a "circle" structure as a parameter and returns the area of the circle.
19. Create a program that defines a structure called "employee" with the fields "name" (string), "age" (integer), "salary" (float), and "department" (string). Write a function called "print\_sales\_employees" that accepts an array of "employee" structures and displays the information for all employees who work in the "Sales" department and earn a salary greater than \$50,000 per year.
20. Create a program that stores information about an employee, including their name (as a string), ID number (as an integer), and hourly wage (as a float). Use a union to store the hourly wage either as a float or an integer (in cents). Prompt the user to enter the employee's information and display the information on the screen.
21. Create a program that converts a value between different units of measurement, including inches, feet, yards, and meters. Use a union to store the value either as a float or an integer (in inches). Prompt the user to enter the value and unit, and display the converted value in all units.
22. Create a program that simulates a bank account, allowing the user to deposit, withdraw, and check their balance. Use a union to store the balance either as a float or an integer (in cents). Prompt the user to enter their account information and perform transactions, and display the balance after each transaction.
23. Create a program that stores information about a product, including its name (as a string), price (as a union of floats and integers), and quantity (as an integer). Prompt the user to enter the product information, and display the total cost of the product (price x quantity).
24. Create a program that stores information about a shape, including its type (as a string), and its dimensions (as a union of floats and integers). Prompt the user to enter the shape information, and display the area of the shape. The program should be able to handle different types of shapes, such as rectangles, circles, and triangles.

25. Define a structure called "person" that contains the fields "name" (as a string), "age" (as an integer), and "height" (as a float). Create a variable of type "person" called "p1" and initialize its fields with values of your choice. Print out the values of the fields.
26. Define a union called "myunion" that contains the fields "i" (as an integer) and "f" (as a float). Create a variable of type "myunion" called "u1" and initialize its fields with values of your choice. Print out the values of the fields.
27. Create a program that stores information about a student, including their name (as a string), ID number (as an integer), and grades (as an array of floats). Use a structure to store the student information. Prompt the user to enter the student's information and grades, and display the average grade.
28. Create a program that stores information about a book, including its title (as a string), author (as a string), and publication year (as an integer). Use a structure to store the book information. Prompt the user to enter the book information and display it on the screen.
29. Create a program that stores information about a circle, including its radius (as a float) and center (as a structure with fields "x" and "y" coordinates as integers). Use a structure to store the circle information. Write a function called "area\_of\_circle" that accepts a "circle" structure as a parameter and returns the area of the circle.
30. Create a program that simulates a bank account, allowing the user to deposit, withdraw, and check their balance. Use a structure to store the account information, including the account number (as an integer) and the balance (as a union of floats and integers). Prompt the user to enter their account information and perform transactions, and display the balance after each transaction.