

FIRST LEARN COMPUTER SCIENCE AND ALL THE THEORY. NEXT DEVELOP A PROGRAMMING STYLE. THEN FORGET ALL THAT AND JUST HACK.

C

PRACTICE QUESTIONS

ANY FOOL CAN WRITE CODE THAT A COMPUTER CAN UNDERSTAND. GOOD PROGRAMMERS WRITE CODE THAT HUMANS CAN UNDERSTAND.

CODING IS FUN

Chapter 1 - Practice Set

Q1 Write a C program to calculate area of a rectangle:

- (a) Using hard coded inputs
- (b) Using inputs supplied by the User

Q2 Calculate the area of a circle and modify the same program to calculate the Volume of a cylinder given its radius and height.

Q3 Write a program to convert Celsius (Centigrade degrees temperature to Fahrenheit)

Q4 Write a program to calculate simple interest for a set of values representing principal, no of years and rate of interest!

Chapter 2 - Practice Set

Q1 Which of the following is invalid in C?

- (i) `int a; b=a;`
- (ii) `int v = 3^3;`
- (iii) `char dt = '21 Dec 2020';`

Q2 What data type will $3.0 / 8 - 2$ return?

Q3 Write a program to check whether a number is divisible by 97 or not.

Q4 Explain step by step evaluation of $3 * z / y - z + k$
where $x = 2 \quad y = 3 \quad z = 3 \quad k = 1$

Q5 $3.0 + 1$ will be:

- (a) Integer
- (b) Floating point number
- (c) Character

Chapter 3 - Practice Set

1 What will be the output of this program

```
int a = 10;  
if (a == 11)  
    printf (" I am 11");  
else  
    printf (" I am not 11");
```

2 Write a program to find out whether a student is pass or fail; if it requires total 40% and at least 33% in each subject to pass. Assume 3 Subjects and take marks as an input from the user.

3 Calculate income tax paid by an employee to the Government as per the slabs mentioned below:

Income Slab	Tax
2.5 L - 5.0 L	5%
5.0 L - 10.0 L	20%
Above 10.0 L	30%

Note that there is no tax below 2.5 L. Take income amount as an input from the user.

4 Write a program to find whether a year entered by the user is a leap year or not. Take year as an input from the user.

- 5 Write a program to determine whether a character entered by the user is lowercase or not.
- 6 Write a program to find greatest of four numbers entered by the user.

(H for HCF)

teach us what two kind of arrays are there
one is total number of elements in array
the other kind of arrays that we use to store
with more helping name after elements that don't have relationship
with each other and hence we can store data
in separate locations and hence in memory.

int

int

float

float

float array

1.0 - 1.0

1.0 - 1.0

1.0 - 1.0

so if I do what sort of array then it will
be called as array and can be denoted by square

Brackets now as taught us that one of arrays are there
there are three different types of arrays
one is that work based on size of array

Chapter 4 - Practice Set

- = 1 Write a program to print multiplication table of a given number n .
- = 2 Write a program to print multiplication table of 10 in reversed order.
- = 3 A do while loop is executed:
 - 1, at least once
 - 2, at least twice
 - 3, at most once
- = 4 What can be done using one type of loop can also be done using the other two types of loops - True or False?
- = 5 Write a program to sum first ten natural numbers using While loop.
- = 6 Write a program to implement program 5 using for and do-while loop.
- = 7 Write a program to calculate the sum of the numbers occurring in the multiplication table of 8. (Consider 8×1 to 8×10).
- = 8 Write a program to calculate the factorial of a given number using a for loop.

- 9 Repeat 8 using while loops
- 10 Write a program to check whether a given number is prime or not using loops.
- 11 Implement 10 using other types of loops.

Chapter 5 - Practice Set

- 1 Write a program using functions to find average of three numbers.
- 2 Write a function to convert Celsius temperature into Fahrenheit.
- 3 Write a function to calculate force of attraction on a body of mass m exerted by earth ($g = 9.8 \text{ m/s}^2$)
- 4 Write a program using recursion to calculate n^{th} element of Fibonacci series.
- 5 What will the following line produce in a C program:
`printf ("%d %d %d\n", a, +a, a++);`
- 6 Write a recursive function to calculate the sum of first n natural numbers.
- 7 Write a program using functions to print the following pattern (first n lines)

*
* * *
* * * * *

Chapter 6 - Practice Set

- 1 Write a program to print the address of a variable. Use this address to get the value of this variable.
- 2 Write a program having a variable i. Print the address of i. Pass this variable to a function and print its address. Are these addresses same? why?
- 3 Write a program to change the value of a variable to ten times of its current value. Write a function and pass the value by reference.
- 4 Write a program using a function which calculates the sum and average of two numbers. Use pointers and print the values of sum and average in main().
- 5 Write a program to print the value of a variable i by using "pointer to pointer" type of variable.
- 6 Try problem 3 using call by value and verify that it doesn't change the value of the said variable.

Chapter 7 - Practice Set

- 1 Create an array of 10 numbers. Verify using pointer arithmetic that $(\text{ptr} + 2)$ points to the third element, where ptr is a pointer pointing to the first element of the array.
- 2 If $S[3]$ is a 1-D array of integers then $*(\text{S} + 3)$ refers to the third element:
- (i) True
 - (ii) False
 - (iii) Depends.
- 3 Write a program to create an array of 10 integers and store multiplication table of 5 in it.
- 4 Repeat Problem 3 for a general input provided by the user using `scanf`.
- 5 Write a program containing a function which reverses the array passed to it.
- 6 Write a program containing functions which counts the number of positive integers in an array.
- 7 Create an array of size 3×10 containing multiplication tables of the numbers 2, 7 and 9 respectively.

- = 8 Repeat problem 7 for a custom input given by the user.
- = 9 Create a three-dimensional array and print the address of its elements in increasing order.

Chapter 8 - Practice Set

1 Which of the following is used to appropriately read a multi-word string

- (a) gets()
- (b) puts()
- (c) printf()
- (d) scanf()

2 Write a program to take string as an input from the user using %c and %s. Confirm that the strings are equal.

3 Write your own version of strlen function from <string.h>

4 Write a function slice() to slice a string. It should change the original string such that it is now the sliced string. Take m and n as the start and ending position for slice.

5 Write your own version of strcpy function from <string.h>

6 Write a program to encrypt a string by adding 1 to the ascii value of its characters.

7 Write a program to decrypt the string encrypted using encrypt function in problem 6.

- 8 Write a program to count the occurrence of a given character in a string.
- 9 Write a program to check whether a given character is present in a string or not.

Chapter 9 - Practice Set

- = 1 Create a two dimensional Vector using structures in C.
- = 2 Write a function SumVector which returns the sum of two vectors passed to it. The vectors must be two-dimensional.
- = 3 Twenty integers are to be stored in memory. What will you prefer - Array or Structure?
- = 4 Write a program to illustrate the use of arrow operator \rightarrow in C.
- = 5 Write a program with a structure representing a complex number.
- = 6 Create an array of 5 Complex numbers created in Problem 5 and display them with the help of a display function. The values must be taken as an input from the user.
- = 7 Write problem 5's structure using `typedef` keyword.
- = 8 Create a structure representing a bank account of a customer. What fields did you use and why?

9 Write a structure capable of storing date.
= Write a function to compare those dates.

10 Solve problem 9 for time using `typedef` keyword.

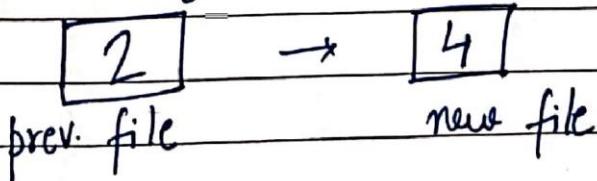
Chapter 10 - Practice Set

- 1 Write a program to read three integers from a file.
- 2 Write a program to generate multiplication table of a given number in text format. Make sure that the file is readable and well formatted.
- 3 Write a program to read a text file character by character and write its content twice in a separate file.
- 4 Take name and salary of two employees as input from the user and write them to a text file in the following format:

name1, 3300

name2, 7700

- 5 Write a program to modify a file containing an integer to double its value.



Chapter 11 - Practice Set

- 1 Write a program to dynamically create an array of size 6 capable of storing 6 integers.
- 2 Use the array in problem 1 to store 6 integers entered by the user.
- 3 Solve problem 1 using malloc()
- 4 Create an array dynamically capable of storing 5 integers. Now use realloc so that it can now store 10 integers.
- 5 Create an array of multiplication table of 7 upto 10 ($7 \times 10 = 70$). Use realloc to make it store 15 numbers (from 7×1 to 7×15).
- 6 Attempt problem 4 using malloc().

"Any fool can write code that a computer can understand. Good programmers write code that humans can understand." - Martin Fowler

solve the problem. Then, write the code." - John Johnson
"Experience is the name everyone gives to their mistakes."
- Oscar Wilde

"In order to be irreplaceable, one must always be different" - Coco Chanel Heilmann
"Knowledge is power." - Francis Bacon
"Sometimes it pays to stay in bed on Monday, rather than spending the rest of the week debugging Monday's code."
- Dan Salomon

"Perfection is achieved not when there is nothing more to add, but rather when there is nothing more to take away."
- Antoine de Saint-Exupéry

Code is like humor. When you have to explain it, it's bad."
- Cory House

"Fix the cause, not the symptom." - Steve Maguire
Optimism is an occupational hazard of programming:
feedback is the treatment. " Kent Beck

"When to use iterative development? You should use iterative development only on projects that you want to succeed." - Martin Fowler

"Simplicity is the soul of efficiency." - Austin Freeman
"Before software can be reusable it first has to be usable."
- Ralph Johnson
"Make it work, make it right, make it fast." - Kent Beck

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