

Adv C Module

1. Subjective

2.1 Basic Refreshers

1. Explain the arithmetic operator.

2.2 1D Pointers and Functions

1. Explain the difference between pass-by-value and pass-by-reference.
2. What is a pointer?
3. Pointers and types and example program
4. What is a pointer? declare a constant pointer?
5. What is the difference between passing by value and passing by reference?
6. Why should I use a pointer?
7. Can I use a character pointer to point to an integer? How?
8. Take an integer pointer and a character pointer and explain with an example.
9. Do you know little-endian and big-endian? Explain with an example.
10. What type of variable is used to collect parameters in pass by reference?
11. What is NULL? What happens if I initialize a pointer to NULL?
12. Explain context switching.
13. What is the size of pointer
14. What is the size of void pointer
15. What is the datatype of a pointer?
16. Is a pointer a datatype or variable?
17. What is the difference between a constant pointer and a pointer to a constant?
18. What is the difference between a string and a character array.

2.3 String

1. Explain the difference between a char array and a string.
2. Explain the use of strcmp.
3. Write a code to copy the string.
4. Explain how strtok will work.

2.5 Storage classes and memory segments

1. Static function
2. Explain the const variable in detail.
3. Explain the volatile in detail.
4. Explain the memory segment in detail.
5. Storage classes with code demonstrating all the keywords in a single program.

2.6 2D Pointers and DMA

1. What is a Function pointer
2. How does a free function know how many blocks of memory to deallocate
3. Explain the Dangling pointer.
4. Explain the void pointer.
5. Explain the NULL pointer.
6. Explain the wild pointer.
7. Take one array of 3 elements and take one more array of 4 Add the previous elements to this and add one more element Replace this array with the previous array using dynamic allocation
8. Explain this (*ptr++).
9. The free function knows how many blocks of memory to deallocate.
10. What is the difference between a function pointer and a pointer to a function?
11. What is the difference between arr[] and *arr?

2.7 Preprocessing

1. Explain the use of macro in detail.

2.8 UDT

1. What are bit fields & their effect on padding?
2. What is the difference between structure and union? Which one better for an embedded system?
3. Create an enum that contains days from Sunday to Saturday (1 to 7). Write a switch case to print the corresponding day based on the enum value, and the default case is for an invalid date. Input should not be given from the user, instead, we should take from the enum variable (using loop, we have to print all the days and invalid dates).

2.9 Miscellaneous

1. Explain volatile keyword in detail and its use.

2.10 FILE I/O

1. Explain the about file operation function.
2. Explain fseek

2.Programming

1. Function to add numbers & return
2. Open the file read the 2D array and store it in a variable
3. convert 2D array to 1D array, and sort it
4. Programming for overlapping of elements of the matrix
5. Volatile and constant be used together?
6. Declare pointer for 2D array
7. WAP to find the maximum of three numbers using macro.
8. WAP to compare the string? Find the loophole present in the string compare function.
9. WAP to find the power of 5 in number.
10. WAP to swap alternate bit in the number.
11. Wap to count and print how many palindrome are in string
str="aabcbaacb";
12. Wap to find the second-largest element.
13. WAP to swap two numbers.

14. WAP to swap two numbers without using temp variable?
15. WAP to reverse the string.
16. WAP to print prime numbers from an array.
17. Wap to count and print how many palindrome are in string
str="aabcbaacb";
18. WAP to find int range.
19. Take 2 function pass 2 elements in the 1st function, print the elements, and in the 2nd function, swap the elements.
20. A file contains the following text :
Name : linux123
Status : active
Name : ubuntu
Status : not active
Name : 33linux55
Status : not active
...
...
...

Write a program to read the file and only display the names and status of the users whose names contain the word 'linux'. Then he asked to modify the code to print only active users with the above condition. Then print even if there are numbers in between the letters.

21. WAP to add to a big number.
22. Given a 2d binary matrix
1101
1001
1111
Traverse through the matrix, and when a 0 is found, make that entire row and column 0.
Op :
0000
0000
1001

23. Asked to sort an array in a way that the numbers repeating more times occupy the start of the array in decreasing order
Before sorting [1, 2, 1, 4, 3, 1, 6, 4]
After sorting [1, 1, 1, 4, 4, 2, 3, 6]
24. There are two matrices: a 5×5 matrix with values 1-25 and a 3×3 matrix with values 1-9. Overlap the 2nd matrix by placing the m[1][1] element on each element of the first matrix. Create a third matrix with the results.
25. Bitwise question: write a function to set, clear toggle the nth bit depending on the user's requirement
26. A question to transfer data from one array to another of different size (both dynamically allocated) and use the correct memory management tools.

MC Module

1. Basic electronics

1. Explain the rectifier.
2. Explain the diode.
3. Explain the transistor.

2. Basics

1. Explain about the microcontroller.
2. Types of input to the MC, Apart from analog and digital inputs.
3. Different Voltages in MC.
4. What is BIOS?
5. Explain the difference between SRAM and DRAM.
6. Explain the PWM and its use.
7. Explain the difference between the RTC and OS.
8. Difference between microcontroller and microprocessor.
9. Draw the PIC18F4580 circuit.
10. How to configure the faulty keyboard.
11. Explain the PIC architecture.

12. What is offset voltage?
13. Explain the SRAM and DRAM in the microcontroller.
14. What are the input and output peripherals in the used microcontroller?

3.Interrupts

1. Explain the different types of timers in detail.
2. If the timer is incrementing every 2ms, then how will you make that 2s delay in it?
3. Explain the clock stretching.
4. Explain the ISR in detail.
5. Explain the use of ISR.
6. What is the size of the timer0, timer1 and timer2?

4.Projects

1. Explain the car black box project.
2. Explain why it is named as pick to light

5.ADC

1. Explain how we are accessing the ADC.
2. How to get the output from the potentiometer.

6. Embedded Systems

1. Explain about embedded system.

7. Protocols

1. Explain the CAN protocol in detail.
2. Explain the SPI protocol in detail.
3. Explain the UART protocol in detail.
4. Explain the I2C protocol in detail.
5. Explain the SPI and UART protocols in detail.

8.PWM

1. Explain the use of PWM in detail

Ds Module

1. Basics

1. What is use of DSA.

2. Linked lists

1. Explain the double-linked list insertion and traversal.
2. WAP to check the circular linked list or not.
3. Explain the linked list and its.

3. Stack

1. Explain the stack in detail.
2. Explain the stack application in detail.
3. Explain the difference between the infix and postfix and prefix.

4. Searching and Sorting Techniques

1. Explain the searching algorithms.
2. Explain the linear search.
3. Explain the binary search.
4. Explain the sorting technique in the array

5. Queue

1. Explain enqueue and dequeue in detail.
2. Explain the queue in detail.

6. Hashing

1. Explain the hash table creation in detail.
2. What is a Binary search tree? Give real-time examples.

7. Trees

1. Write a program to find the leftmost element of each level of a BST.

LI Module

1. Basics

1. Explain the booting sequence.
2. Basic Linux commands
3. How the scheduling will work.
4. Explain the round-robin scheduling.
5. What is virtual memory?
6. How to make a Slow computer become faster.

2. System call

1. Explain the open system call in detail.
2. Explain the read and write system call.

3. Process

1. Explain the fork and its use.
2. What is the use of the exec system call? And its variants.
3. WAP to make your system hang.
4. Explain the process in detail.
5. Explain the zombie process in detail.
6. How will you print a PID of a process when you only know its process name?

4. IPC

1. What is the use of pipe?
2. How to communicate using a pipe.
3. List all IPC mechanisms.
4. Use of SHM in detail.

5. Signal

1. Explain the signals in detail.
2. What is a SIGINT signal?

6. Socket

1. Explain the use of TCP programming.
2. Explain the use of UDP programming.
3. Difference between TCP and UDP sockets.

7.Threads

1. Explain the use of mutexes and semaphores.
2. Explain the difference between a process and a thread.
3. Explain the binary semaphore in detail
4. Explain the semaphores in detail.
5. What is the use of a mutex?
6. What is meant by deadlock?

8.Process and Memory Management

1. Some questions related to Memory & Process Scheduling Types.

C++ Module

1. Explain the constructor in detail and its types.
2. What are Virtual keywords?
3. Explain the OOPS concept.
4. What is priority inversion?
5. Explain the polymorphism.
6. Explain the use of the class.
7. Explain Inheritance and its types.
8. Implicit declaration types in C++
9. Sorting method code in C++
10. Explain the Virtual destructor
11. Check if the 2 strings are palindromes or not using C++
12. Difference between encapsulation and abstraction.