Adv C Module

1. Subjective

2.1 MCQ

1. What would be the output of the following code

```
main(){
        char *ptr = "Lekha";
        printf("%c",*ptr++);
}
```

    a. L
    b. Lk
    c. ek
    d. Two numbers

2. What would be the output of the following code

```
void main()
{
        int b = 5 & 4 & 6;
        printf("%d", b);
}
```

    a. 4
    b. 5
    c. 3
    d. 6

3. What would be the output of the following code

```
int main()
{
        int a = 15, b;
        b = (a++) + (a++);
        a = (b++) + (b++);
        printf("a = %d b = %d”, a, b);
        return (0);
}
```

    a. a=33 b=63
    b. a=63 b=33
    c. a=66 b=33

d. a=33 b=33

4. value of c after the following expression initializations: a = 1, b = 2, and c = -1); c += (c) ? a : b;
    a. C = 1
    b. C = 0
    c. C = 2
    d. C = 3
5. Which of the following statements are correct about an array?
    i) The array int num[26]; can store 26 elements
    ii) The expression num[1] designates the very first element in the array
    iii) It is necessary to initialize the array at the time of declaration
    iv) The global declaration num[size] is allowed if SIZE is a macro
    a. (i) and (iv)
    b. (i)
    c. (ii) and (iii)
    d. (ii) and (iv)
6. What does the following declaration signify?
    char *scr;
    a. scr is a pointer to pointer variable
    b. scr is a function pointer
    c. scr is a member of function pointer
    d. scr is a pointer to char
7. Which of the following is not a valid variable name declaration?
    a. int _a3;
    b. int a_3;
    c. int 3a;
    d. int 3_a;
8. How many times will the loop get executed?

```
#include<stdio.h
int main()
{
    int i = 0;
    while(i <= 255)
```

```
{
        printf(“%d”, i);
        i++;
}
return 0;
}
```

a. Infinitetimes
b. 1 time
c. 256 times
d. 255 times

9. Which bitwise operator is suitable for checking whether a particular bit is on or off?
    a. NOT
    b. XOR
    c. AND
    d. OR
10. What would be the output of the following code

```
int main()
{
        int c = 4;
        c = c++ + ~++c;
        printf("%d”, c);
        return (0);
}
```

    a. 3
    b. -3
    c. 31
    d. compile-time error

2.2 Basic Refreshers

1. How many bits in 1 byte?
2. How do you perform byte swapping on an integer?
3. Explain the segmentation fault.
4. What is a variable?
5. What is meant by data type? Explain one by one.
6. Explain the compile error.

2.3 1D Pointers and Functions

1. Explain the pointer. And types of pointers.

2.4 String

1. Explain the string in detail.

2.5 Storage classes and memory segments

1. Explain the storage class.

2.6 2D Pointers and DMA

1. Explain the memory allocation.
2. What is the difference between static and dynamic memory allocation?
3. Explain the recursion with an example.
4. Explain the function pointer with an example.
5. Explain the memory leakage.

2.7 Preprocessing

1. Explain the preprocessing stage.
2. What is the purpose of preprocessing?
3. Explain the assembly stage.
4. What are compile time and runtime?

2.8 UDT

1. What is the difference between a structure and a union?
2. Explain the bit manipulation.
3. What is the difference between a macro and a function?

2.9 Miscellaneous

1. Explain const and volatile with an example program.
2. Explain the volatile keyword with a real-time example.

2.10 Projects

1. Explain the steganography project in detail.
2. Explain the address book project in detail.

2. Programming

1. WAP to check if a given number is prime or not.
2. WAP to reverse the string.
3. WAP to implement atoi.
4. WAP to set the 4-bit.
5. WAP to circular right shift.
6. WAP to reverse each word in the sentence.

7. WAP to check if a given number is an anagram or not.
8. WAP to shuffle a string based on a given array.
9. WAP to access the array elements using pointers.
10. WAP to print array elements using a function.
11. WAP to implement the strtok().
12. WAP to allocate the memory array dynamically using structure.
13. WAP to print the repeated elements and their count of the array.
14. WAP to remove the middle elements of the array for both even limits (remove two elements) and odd limits.
15. WAP to find the second largest in the array.
16. Write a program to find the biggest possible palindrome what can be formed using the characters from a given set of words? If there are multiple palindromes of the same length that could be formed, print any one of them.

    Input:

    A string containing a set of words.

    Example Input:

    This is a Sample text for testing

    Output:

    The program should print

    1. The length of the longest possible palindrome.

    2. An example of the palindrome formed.

    Example Output:

    Max possible palindrome: 15 characters

    Ex: ttissaepeassitt

    Requirements:

    - The program should be case-insensitive when processing the input but should output the result in the same case as the input.
    - The program should ignore spaces and only consider alphanumeric characters for the palindrome.

Constraints:

- The input string can have up to 1000 characters.
- The program should handle letters only and may disregard numbers or special characters unless explicitly required.

17. Given an n*m 2D array, print the elements starting from a specified position (r, c) in a zigzag pattern. If the starting position is in the top row, the direction should be downward, and if it is in the bottom row, the direction should be upward. Alternate directions as you move across columns.
    Array:
    5 6 15 16 25
    4 7 14 17 24
    3 8 13 18 23
    2 9 12 19 22
    1 10 11 20 21
    Example:
    Input: Starting Position: (4, 0)
    Output: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25
    Input: Starting Position: (4, 1)
    Output: 10, 9, 8, 7, 6, 15, 14, 13, 12, 11, 20, 19, 18, 17, 16, 25, 24, 23, 22, 21, 1, 2, 3, 4, 5
    Input: Starting Position: (0, 3)
    Output: 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 5, 4, 3, 2, 1, 10, 9, 8, 7, 6, 15, 14, 13, 12, 11
18. Write a program to find two adjacent numbers from a given matrix that add up to a specified sum. The numbers can be adjacent either horizontally, vertically, or diagonally.
    Example Input:
    Given matrix:
    1 3 4 6 2
    3 5 8 9 0
    1 7 3 2 4
    2 3 1 4 2
    6 4 3 2 1
    Specified sum: 10

Example Output:

The output should display the pairs of adjacent numbers that add up to the specified sum and their positions:

Output:
4 + 6 : 10
7 + 3 : 10
7 + 3 : 10
6 + 4 : 10
3 + 7 : 10
8 + 2 : 10
6 + 4 : 10

19. Write a C program that takes an integer input from the user and calculates the sum of all even digits present in the number. If the sum is more than two digits, repeatedly sum the even digits of the result until a single-digit sum is obtained.
Requirements:
    - The program should handle both positive and negative integers.
    - If there are no even digits, the program should display Sum of even digits: 0.

Additional Condition:
    - If the initial sum of even digits results in a number with more than two digits, continue summing its even digits until a single-digit sum is obtained.

Example Outputs:
    1. Input: 123456 Initial Output: Sum of even digits: 12 Final Output: Sum of even digits after reduction: 2
    (Explanation: The Initial sum of even digits is Sum of the even digits of 12 is 2 + 0 = 2, which is already a single digit.
    2. Input: -8893472 Initial Output: Sum of even digits: 22 Final Output: Sum of even digits after reduction: 4

(Explanation: The Initial sum of even digits is Sum of the even digits of 22 is 2+2 = 4, a single digit.

3. Input: 13579 Initial and Final Output: Sum of even digits: 0
   (Explanation: There are no even digits.)

MC Module

1. Basic electronics

1. What are the main components of a microcontroller?
2. What is the purpose of a crystal oscillator connected to a microcontroller?
3. What is the importance of using a bypass capacitor in microcontroller circuits?

2. Basics

1. What is meant by microcontroller?
2. Explain the memory architecture of a PIC microcontroller.
3. What is the difference between 8-bit and 16 bit microcontrollers?

3. Interrupts

1. What is an interrupt? And its types.
2. Explain the timer.
3. Explain the difference between polling and interrupt-based programming in microcontrollers.

4. Projects

1. Explain the car black box project.
2. Explain the digital timer project.

5. ADC

1. Explain the process of ADC (Analog to Digital Conversion) in a microcontroller.

6. Embedded Systems

1. What is meant by embedded system give me some real-time examples.

7. Protocols

1. Explain the UART protocol with a frame format.
2. Explain the CAN protocol with a frame format.
3. Explain the I2C protocol with a frame format.
4. Explain the SPI protocol with a frame format.

8. PWM

1. What is PWM (Pulse Width Modulation)? How is it used in microcontrollers?

9. programming

1. WAP to blink a led when the user presses a switch. if it is a short press, blink the led 2 times; if it is a long press, blink the led 4 times; and if it is a very long press, blink the led 6 times using the rising edge and falling edge technique.

CPP Module

1. Explain the polymorphism.
2. Explain the v-table.
3. Explain the OOP concepts.
4. Features of functions in C++ that are not available in C.
5. Why we can’t have a virtual constructor.
6. What is the difference between an object and an instance?
7. What is the size of an empty class?
8. What is the difference between a constructor and a destructor?
9. What is the difference between classes and objects?

Ds Module

1. Basics

1. What is meant by data structure?
2. What is the difference between linear and nonlinear data structures?

2. Linked lists

1. Explain the linked list.
2. What is the difference between an array and a linked list?
3. How are dynamic memory allocation, reallocation, and deallocation handled in a linked list?

3. Stack

1. Explain the stack in detail.
2. WAP to implement stack using linkedIn list.
3. Explain the conversion of infix to prefix expression.

4. Searching and Sorting Techniques

1. What is the maximum number of swaps required to sort an array using the selection sort algorithm?
2. WAP to sort a single linked list using merge sort.
3. WAP to implement merge sort using a linked list.

5. Queue

1. Explain the queue in detail.
2. What is the difference between a Circular Queue and a Linear Queue?
3. How do you handle Queue overflow and underflow conditions?
4. Implement a queue using an array.

6. Hashing

1. What is Hashing? Why is it used?
2. What is a Hash Function? What makes a good hash function?
3. What is a Hash Table? How is it implemented?

7. Trees

1. What is a Tree? How is it different from a graph?
2. What is a Binary Tree?
3. WAP to implement the binary tree using recursion.

8. Projects

1. Explain the inverted search project.
2. Explain the red-black tree.

LI Module

1. Basics

1. What is the difference between user space and kernel space?
2. What is OS and types of OS?
3. Explain the bg, fg and job.
4. What is Linux?
5. What is the difference between Unix and Linux?
6. Explain the booting sequence.
7. What is init?
8. What is the PID of init?
9. What are static linking and dynamic linking?
10. What is a shared library?

2. System call

1. What is a system call in an operating system? Explain the working of a system call.

3. Networking

1. How do you create a socket, and in what layer is it?
2. Port number, why we need it.
3. In bind(), what all things are we binding? Return value of bind().
4. What is the difference between concurrency and parallelism?

4. Process

1. Explain the process cycle.
2. What is meant by orphan?
3. What is meant by zombie?

5. IPC

1. Explain the IPC mechanism.
2. What is the difference between IPC and system calls?
3. Explain the pipe.

6. Signal

1. Explain the origin of the signal.
2. What is the difference between an interrupt and a signal?

7. Socket

1. What is a socket? Explain its role in network communication.
2. What is the difference between TCP and UDP sockets?
3. You are writing a server that should handle multiple clients. What are the options available to handle this? Which is better for scaling?
4. What happens if a client disconnects without closing the socket? How should the server handle this?

8. Threads

1. Explain the thread in detail.
2. Explain multithreading with an example.
3. What is the difference between mutexes and semaphores?
4. Why we need threads in programming.
5. What is try_lock()?
6. What is the difference between a process and a thread?
7. Explain the deadlock and how we can overcome it.

9. Process and Memory Management

1. Explain the process management.

General Questions
Aptitude

1. AS/400 is being used in a project. Here, the user wants to pass on the parameters with the command interface. Which of the following is correct
    a. PARM
    b. KEY
    c. PARAM

2. During the designing phase of SDLC, the model is based upon the requirements as specified. in case a requirement changes, which model is the least suitable to accommodate?

    a. Prototyping Model
    b. RAD Model
    c. Build & Fix Model
    d. Waterfall Model

3. if the radius of a circle is diminished by 10%, then its area is diminished by
    a. 10%
    b. 36%
    c. 20%
    d. 19%
4. Jason traveled 3000 km by air, which formed 2/5 of his trip. One-third of the whole trip, he traveled by car, and the rest of the journey he performed by train. What was the distance traveled by train?
    a. 1000 Km
    b. 2000 Km
    c. 2500 Km
    d. 3000 Km
5. A shopkeeper sold a TV set for Rs 17,940 with a discount of 8% and earned a profit of 19.6%. What would have been the percentage of profit earned if no discount was offered?
    a. 24.8%
    b. 75%
    c. 26.4%
    d. None of these
6. A man can row upstream at 8 kmph and downstream at 13 kmph. The speed of the stream is?
    a. 10.5 kmph
    b. 4.2 kmph
    c. 5 kmph
    d. 2.5 kmph

7. A farmer decides to plough a Rectangle shaped field whose land measures 122x37 m. To plough the field using a tractor, the driver charges Rs.55 per square meter. Find the overall cost to the farmer.

    a. 284270
    b. 124135
    c. 99308
    d. 248270

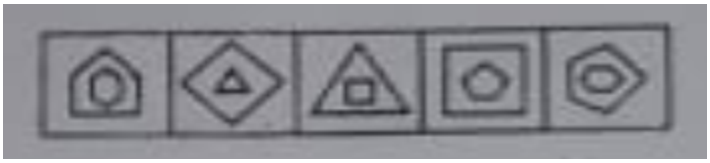
8. P, Q, R, S, T, U, V, and W are sitting round the circle and are facing the center. P is second to the right of T, who is the neighbor of R and V. S. is not the neighbor of P. V is the neighbor of U. Q is not between S and W. W is not between U and S. Then Who is sitting opposite U?
    a. P
    b. D
    c. A
    d. K

9. Where does a computer add and compare data?
    a. Floppy Disk
    b. Hard Disk
    c. Memory Chip
    d. CPU-Chip

10. What can you conclude from the given statements
    All mars are stars
    All Stars are moons
    a. Some mars are not stars
    b. Some moons are not stars.
    c. Some mars are moons
    d. Some stars are not moons

11. In the first 35 overs of a cricket game, the run rate was only 6.4. What should be the run rate in the remaining 15 overs to reach the target of 410 runs?
    a. 12.4
    b. 13.64
    c. 11.16
    d. 46.49333
12. If orange is called butter, butter is called soap, soap is called ink, ink is called honey, and honey is called orange, which of the following is used for washing clothes?
    a. Ink
    b. Butter
    c. Orange
    d. Honey
13. Read each sentence to find out whether there's any grammatical error in it. The option which has error in any part of the sentence will be the answer
    a. The RBI has proposed to introduce
    b. The cost and longevity
    c. Polymer notes after taking into considering
    d. Associated with their manufacturing
14. In a certain code language
    jumo junta kinta means 'flowers are good,' then
    junta kinta piccho means 'are good people,' and
    piccho jumo junta means 'people flowers are.'
    Find the code language for 'people.'
    a. Junta or kinta
    b. jumo
    c. junta
    d. Piccho

15. Out of the five figures, four are similar in a certain manner. However, one figure is not like the other four. Choose the figure which is different from the rest



    a. 1
    b. 2
    c. 3
    d. 4

16. Find the next number in the series -7, 24, 44, 67.
    a. 91
    b. 93
    c. 94
    d. 92

17. Two trains running in opposite directions cross a man standing on the platform in 2727 seconds and 1717 seconds, respectively. If they cross each other in 2323 seconds, what is the ratio of their speeds?
    a. 3:2
    b. 3:1
    c. 1:3
    d. 1:2

18. A bag contains 2 yellow, 1 green, and 2 blue balls. Two balls are drawn at random. What is the probability that none of the balls drawn is blue?
    a. ½
    b. 10/21
    c. 9/11
    d. 7/11

19. X and Y invest Rs. 21000 and Rs. 17500 respectively in a business. At the end of the year, they make a profit of Rs.26400. What is the share of X in the profit?
    a. Rs 12000
    b. Rs 26400
    c. Rs 14400
    d. Rs 12500

20. Suresh started a business with Rs 20,000 Kiran joined him after 4 months with Rs 30,000. After 2 more months, Suresh withdrew Rs. 5,000 of his capital, and 2 more months later, Kiran brought in Rs. 20,000 more. What should be the ratio in which they should share their profits at the end of the year?
    a. 32:21
    b. 21:32
    c. 12:17
    d. 17:12
21. An organization decided to raise 6Rs. 6 lakh by collecting equal contributions from each of its employees. If each of them had contributed Rs. 60. 60 extra, the contribution would have been Rs. 6.24Rs. 6.24kHow many employees are there in that organization?

    a. 300
    b. 400
    c. 200
    d. 100
22. January 1, 2008 is Tuesday. What day of the week lies on Jan 1, 2009?
    a. Saturday
    b. Wednesday
    c. Sunday
    d. Thursday
23. A flagstaff 17.5 m high casts a shadow of length 40.25 m. What will be the height of a building that casts a shadow of length 28.75 m under similar conditions?
    a. 12m
    b. 10.5m
    c. 14m
    d. 12.5m

24. A person works on a project and completes 5/8 of the job in 10 days. At this rate, how many more days will it take him to finish the job?
    a. 7
    b. 6
    c. 5
    d. 4
25. How many kilograms of sugar costing Rs. 9 per kg must be mixed with 27 kg of sugar costing Rs. 7 per kg so that there may be a gain of 10% by selling the mixture at Rs. 9.24 per kg?
    a. 63kg
    b. 60kg
    c. 58kg
    d. 56kg
26. The ages of two persons differ by 16 years. 6 years ago, the elder one was 3 times as old as the younger one. What is the present ages of the elder person?
    a. 10
    b. 30
    c. 20
    d. 40
27. if 6 years are subtracted from the present age of Ajay and the remainder is divided by 18, then the present age of Rahul is obtained. If Rahul is 2 years younger to Denis whose age is 5 years, then what is Ajay's present age?
    a. 50
    b. 62
    c. 55
    d. 60
28. 967578x625=?
    a. 604736250
    b. 604736260
    c. 604816250
    d. 609776250

29. logx(9/32) = -⅛, find the value of x
    a. (9/32)8
    b. $(9/32)^2$
    c. (32/9)8
    d. $(32/9)^2$
30. ? - 3699 + 1985 - 2047 = 31111
    a. 21274
    b. 27224
    c. 21224
    d. 27474
31. if the product 4864 x 9a2 is divisible by 12, then what is the value of a?
    a. 1
    b. 2
    c. 5
    d. 1
32. The difference of two numbers is 1365. On dividing the larger number by the smaller, 6 is obtained as the quotient and 15 as the remainder. What is the smaller number?
    a. 310
    b. 330
    c. 270
    d. 250
33. b - [b - (a + b) - { b - (b - a + b)} + 2a) = ?
    a. -2a
    b. 4a
    c. a
    d. 15
34. How many pieces of 85 cm length can be cut from a rod of 42.5 meters long?
    a. 50
    b. 20
    c. 2
    d. 15

35. In a garden, there are 10 rows and 12 columns of mango trees. The distance between two trees is 2 meters, and a distance of 1 meter is left from all sides of the boundary of the garden. What is the length of the garden?
    a. 30m
    b. 24m
    c. 26m
    d. 28m
36. Evaluate the expression: 16.5% of 300 + 70.5% of 1400 - 10% of 480 = ?
    a. 957.6
    b. 968.2
    c. 935.4
    d. 988.5
37. Five words are given below. Which of them will come in the middle if all of them are arranged alphabetically as in a dictionary? Butterfly, Butter, Butler, Butcher, Button
    a. Butterfly
    b. Butter
    c. Butcher
    d. Button
38. Which of the following is a true statement about intranet and Internet?
    a. Encryption is necessary
    b. They use similar protocols.
    c. Speed is slow
    d. They use the same protocol
39. From a tank of petrol, which contains 200 liters of petrol, the seller replaces it each time with kerosene when he sells 40 liters of petrol (or its mixture). Every time he sells out, only 40 liters of petrol (pure or impure) are sold. After replacing the petrol with kerosene for the 4th time, the total amount of kerosene in the mixture is
    a. 81.92L
    b. 118.08 L
    c. 96L
    d. None of these

40. What is the name of the virus that fool a user into downloading and executing them by pretending to be useful applications?
    a. Worm
    b. Keylogger
    c. Trojan horses
    d. File virus
41. Is a specialized server that enables the client to share applications and data across the network
    a. Mass Server
    b. Host server
    c. Data Server
    d. File Server
42. $\frac{14^3 \times 7^2}{98} = ?$
    a. 1372
    b. 1642
    c. 2022
    d. 1802
43. What is meant by wireless technology?
44. What do you know about Bluetooth?
45. What is meant by dbms.
46. Problem Title: Coin Change

    Description:

    You are given an integer array coins representing coins of different denominations and an integer amount representing a total amount of money.

    Return the fewest number of coins that you need to make up that amount.

    If that amount cannot be made up by any combination of the coins, return -1.

    You may assume that you have an infinite number of each kind of coin.

    Example:

    Input: coins = [1, 2, 5], amount = 11

    Output: 3

    Explanation: 11 = 5 + 5 + 1

47. Cool Number Check

Description:

You are given a positive integer num. Write a function to check if it is a cool number. A number is considered "cool" if the sum of the digits in the first half is equal to the sum of the digits in the second half.

For odd-length numbers, ignore the middle digit.

Example 1:

Input: num = 23650

Output: Yes, cool number

Explanation: 2 + 6 = 3 + 5 + 0 → 8 = 8

Example 2:

Input: num = 123456

Output: No, not a cool number

48. Count Substring Occurrences (with Overlap)

Description:

Given a string s and a pattern string p, write a function that counts how many times p appears in s, allowing overlapping occurrences.

Example:

Input: s = "abababababa", p = "aba"

Output: 4

Explanation: "aba" occurs at indices 0, 2, 4, and 6 (overlapping allowed).

49. The following IC is to be interfaced with a microcontroller.

- HT9170

1) Explain the use of the IC mentioned above.

2) Explain how the IC gives the output.

3) Make a block diagram showing the interfacing with any 8051 / Any AVR Microcontroller/ Any STM controller.

4) Write a code in the Embedded C Language to achieve the following:

a) The microcontroller is clocked using an external crystal of 16 MHz.

The clock setup needs to be done manually and not by using any library function.

b) DTMF Reception Logic:

- Assume a valid DTMF can be received at any point of time.
- Read the valid DTMF data
- Store the first 10 digits in an array.
- Use interrupts to achieve this logic

50. Which of the following best describes the difference between error seeding and mutation testing?
    a. Error seeding involves intentionally adding known errors to assess the test suite's effectiveness, while mutation testing involves making small modifications to a program's source code to check if the test cases can detect the changes.
    b. Error seeding is a technique used to identify the locations in the code where errors are likely to occur, whereas mutation testing is a practice of testing how well the software can adapt to changes in requirements.
    c. Error seeding is a process of automatically generating test cases based on the software's failure history, while mutation testing involves creating variations of the software to test the reliability of the deployment environment.
    d. Error seeding and mutation testing are synonymous terms used to describe the process of evaluating the security vulnerabilities in a software application.
51. Given a time in 12-hour AM/PM format, convert it to military (24-hour) time.
    - Note:
        - 12:00:00 AM on a 12-hour clock is 00:00:00 on a 24-hour clock.
        - 12:00:00 PM on a 12-hour clock is 12:00:00 on a 24-hour clock.

Input:

- A single string s representing a time in 12-hour clock format (i.e., hh:mm:ssAM or hh:mm:ssPM).

Output:

- Return the time in 24-hour clock format as a string (hh:mm:ss).

Example:

- Input: 07:05:45PM
- Output: 19:05:45

Constraints:

- All input times are valid, and the string s will always be in the format hh:mm:ssAM or hh:mm:ssPM.
- Print an error if user gave wrong format

52. You have three boxes:
    One contains only apples.
    One contains only oranges.
    One contains a mix of both apples and oranges.
    Each box is labeled, but all the labels are incorrect.
    You are allowed to pick only one fruit from one box, without looking inside, in order to determine the correct contents of all three boxes.
    How can you identify the correct contents of each box with just one fruit pick?

53. You have two sand timers—one that measures 11 minutes and another that measures 7 minutes.
    How can you use them to measure exactly 15 minutes?
54. There are 10 machines, each producing gold coins that weigh 100 grams. However, one machine is faulty and produces coins that weigh 101 grams.
    You are allowed to weigh the coins only once.
    How can you identify the faulty machine using just one weighing?

55. Given a hike characterized by a sequence of steps 'U' (uphill) and 'D' (downhill), we want to analyze the hike data to determine how many valleys the hiker passed through. A valley is defined as any sequence of steps that starts below sea level and ends when the hiker returns to sea level.

Problem Statement:

Input:

- An integer n representing the number of steps.
- A string of length n representing the sequence of steps, where 'U' indicates an uphill step and 'D' indicates a downhill step.

Output:

- The number of valleys the hiker walked through.
- A simple visualization of the hike as up ("/") and down ("") movements.

Example:

Input:

8

UDDDUDUU

Output:

```
_/\   _
  \ /
   W
```

The hiker enters and leaves 1 valley.

Explanation:

- The hiker starts at sea level.
- Steps are taken as follows:
  - Up to altitude + 1 (U)
  - Down to altitude 0 (D)
  - Down to altitude -1 (D)
  - Down to altitude -2 (D)
  - Up to altitude - 1 (U)
  - Down to altitude -2 (D)

    - Up to altitude - 1 (U)
    - Up to altitude 0 (U)—end of a valley.
- The hiker enters and leaves 1 valley during the hike.