Sr#	Assignment text	Topic-1	Topic-2	Topic-3	Topic-4	Out of list Topic	Contributor
1	Write five C++ statements to print the asterisk pattern as shown below using cout? * ** *** **** *****	Output using “cout”.					Dr. Syed Asad Naqvi
2	write a program that show that output using setw manipulator. 200 300 200 300 200 300	Formatting output using the setw manipulator.					nadeem.sarfraz@superior.edu.pk
3	write a program that show that output using setw manipulator. 24 25 26	Formatting output using the setw manipulator.					nadeem.sarfraz@superior.edu.pk
4	Write a program that show that output using setw manipulator. 2477	Formatting output using the setw manipulator.					nadeem.sarfraz@superior.edu.pk
5	write a program that show that output using setw manipulator. 786 Superior University	Formatting output using the setw manipulator.					nadeem.sarfraz@superior.edu.pk
6	write a program that show that output using setw manipulator. 1 2 3 4 5 6 7 8 9	Formatting output using the setw manipulator.					nadeem.sarfraz@superior.edu.pk
7	write a program that show that output using setfill manipulator. xxxxxxxx77 GeeksGGGGG	Formatting output using the setfill manipulator.					nadeem.sarfraz@superior.edu.pk
8	write a program that show that output using setfill manipulator. * ** *** **** *****	Formatting output using the setfill manipulator.					nadeem.sarfraz@superior.edu.pk
9	**write a program that show that output using setfill manipulator.** ****200**300** *****200***300** ******200****300** *******200*****300**	Formatting output using the setfill manipulator.					nadeem.sarfraz@superior.edu.pk
10	**write a program that show that output using fixed manipulator.** **without fixed flag: 1.23** **with fixed flag: 1.23000**	Formatting output using the fixed manipulator.					nadeem.sarfraz@superior.edu.pk
11	**write a program that show that output using fixed manipulator.** **without fixed flag: 1.23e+09** **with fixed flag: 1230000000.00000**	Formatting output using the fixed manipulator.					nadeem.sarfraz@superior.edu.pk
12	write a program that show that output using fixed manipulator. default: 3.1416 2006 1e-010 fixed: 3.14159 2006.00000 0.00000 scientific: 3.14159e+000 2.00600e+003 1.00000e-010	Formatting output using the fixed manipulator.					nadeem.sarfraz@superior.edu.pk
13	write a program that show that output using fixed manipulator. 30.000 10000. 3.1416 30 10000 3.1416	Formatting output using the showpoint manipulator.					nadeem.sarfraz@superior.edu.pk
14	write a program that show that output using fixed manipulator. Precision set to 2: 192.99 168.00 3.14 Precision set to 4: 192.9864 168.0000 3.1416 Precision set to 6: 192.986400 168.000000 3.141590	Formatting output using the showpoint manipulator.					nadeem.sarfraz@superior.edu.pk
15	write a program that show that output using left manipulator. - 24 -24 -24	Formatting output using the left manipulator.					nadeem.sarfraz@superior.edu.pk
16	write a program that show that output using left manipulator. Left fill: -1.23****** 0x2a******** USD *1.23*** Internal fill: -*******1.23 0x********2a USD ****1.23 Right fill: ********-1.23 ********0x2a ***USD *1.23	Formatting output using the left manipulator.					nadeem.sarfraz@superior.edu.pk
17	write a program that show that output using right manipulator. 5 5 5 5 5 5	Formatting output using the right manipulator.					nadeem.sarfraz@superior.edu.pk
18	write a program that show that output using right manipulator. - 24 -24 -24	Formatting output using the right manipulator.					nadeem.sarfraz@superior.edu.pk
19	Write a program that reads two values in variable x and y, print values of x and y on the screen. Then exchange the value of x and y and print the new values after the exchange.	Initialization and assignment of variables.					Dr. Syed Asad Naqvi

20	Write a program which takes 2 integers as input from the user and prints their sum, product, difference, product, division and remainder. **Sample Input/Output:** Enter first integer:100 Enter second integer: 72 Sum is: 172 Difference is: 28 Product is: 7200 Quotient is: 1 Remainder is: 28 Rewrite the above program but this time take the input in two floating point variables instead of integers and see what happens.	Arithmetic operators (+, - , * /, %).					Dr. Syed Asad Naqvi
21	Write a program that inputs the radius of a circle and outputs its diameter, circumference, and area. Use the value 3.14159 for π (PI)	Arithmetic operators (+, - , * /, %).					Dr. Syed Asad Naqvi
22	Write a program that inputs the Base and Height of a Triangle and calculates its Area. Formula: Area of Triangle = (base*height)/2. **Sample Input/Output** Base is 2 Height is 4 The area for the triangle with the base of 2 and the height of 4 is: 4.0	Arithmetic operators (+, - , * /, %).					Dr. Syed Asad Naqvi
23	Write c++ code that take temperature in Fahrenheit (F) and convert it to Kelvin (K) and display value of K using following equation: C=(F-32)/1.8; K=C+273;	Arithmetic operators (+, - , * /, %).					Dr. Syed Asad Naqvi
24	Write C++ code that take int a, b and c from user and display output x according to following equation: x = 30(a^2+c^4-b^3)	Arithmetic operators (+, - , * /, %).					Dr. Syed Asad Naqvi
25	Write C++ code that take int a,b, c and d from user and display output y according to following equation y=(d((a×b^3+c)-20))/((a-b)c)	Arithmetic operators (+, - , * /, %).					Dr. Syed Asad Naqvi
26	Newton's law states that the force, F, between two bodies of masses M1 and M2 is given by: F = K(M1*M2)/d^2 in which K is the gravitational constant and 'd' is the distance between the bodies. The value of K is approximately 6.67 x 10^(-8). Write a program that prompts the user to input the masses of the bodies and the distance between the bodies. The program then outputs the force between the bodies.	Arithmetic operators (+, - , * /, %).					Dr. Syed Asad Naqvi

27	State the order of evaluation of the operators in each of the following C++ statements and show the value of x after each statement is performed. Write a program to check your answers.
	a) x = 7 + 3 * 6 / 2 - 1;
	b) x = 2 % 2 + 2 * 2- 2 / 2;
	c) x = (3 * 9 * (3 + (9 * 3 / (3))));
	d) x = 2 * 3 / 4 + 4 / 4 + 8 – 2 + 5 / 8;
	e) x = 3 / 2 * 4 + 3 / 8 + 3;
		Operator precedence.	Arithmetic operators (+, - , * /, %).				Dr. Syed Asad Naqvi

28	Write a program that gets the GPAs and credit hours of 5 courses and calculate your CGPA using the following formula. CGPA = total_earned / total_credit_hour Total_earned = (gpa1*credit_hour1) + (gpa2*credit_hour2) + (gpa3*credit_hour3) + (gpa4*credit_hour4) + (gpa5*credit_hour5); Total_credit_hour = credit_hour1 + credit_hour2 + credit_hour3 + credit_hour4 + credit_hour5	Arithmetic operators (+, - , * /, %).					Dr. Syed Asad Naqvi
29	Write a program to find the value of distance D for given values of x, v, t, a Where D= x + vt + 1/2at^2	Arithmetic operators (+, - , * /, %).					Dr. Syed Asad Naqvi
30	If a =10, b = 12, c = 0. Find the values of each of the following expressions. Write a program to calculate and display the value of each expression. 1. a++ + ++a; 2. b=b++ + b-- + a++ + ++a 3. c=(c++ * b-- - ++a) / --c 4. a=(c++ % ++b) + --a + a--	Operator precedence.	Increment and decrement operators.	Arithmetic operators (+, - , * /, %).			Dr. Syed Asad Naqvi
31	If you have two fractions, a/b and c/d, their sum can be obtained from the formula: (a/b) + (c/d) = ((a*d)+(b*c))/(b*d) Write a program that encourages the user to enter two fractions, and then displays their sum in fractional form. (You don't need to reduce it to the lowest terms.) The interaction with the user might look like this: **Enter first fraction: 1/2** **Enter second fraction: 2/5** **Sum = 9/10**	Arithmetic operators (+, - , * /, %).	Output using "cout".				Dr. Syed Asad Naqvi
32	Suppose int1 and int2 are int variables and dec1 and dec2 are double variables. Assume the following input data: (2) 56.50 67 48 62.72 What value (if any) is assigned to int1, int2, dec1, and dec2 after each of the following statements executes? (Use the same input for each statement.) a. cin >> dec1 >> int1 >> int2 >> dec2; b. cin >> int1 >> dec1 >> dec2 >> int1; c. cin >> dec1 >> dec2 >> int1 >> int2; d. cin >> int1 >> dec1 >> int2 >> dec2; e. cin >> int1 >> int2 >> dec1 >> dec2;	User Input, cin and the Extraction Operator >>.					noorullah@superior.edu.pk

33	Suppose x, y, and z are int variables and ch is a char variable. Consider the following input:
	78 86 18 #42 &
	What value (if any) is assigned to x, y, z, and ch after each of the following statements executes? (Use the same input for each statement.)
	a. cin >> x >> y >> z >> ch;
	b. cin >> ch >> x >> y >> z;
	
	c. cin >> x;
	cin.get(ch);
	cin >> y >> z;
	
	d. cin >> x >> ch >> y >> z;
	e. cin.get(ch);
	cin >> x >> y >> z;
		Input stream manipulation using the get function.	User Input, cin and the Extraction Operator >>.				noorullah@superior.edu.pk

34	Suppose that int1 and int2 are int variables, dec is a double variable, and ch is a char variable. Suppose the input statement is: cin >> int1 >> ch >> int2 >> z; What values, if any, are stored in int1, int2, dec, and ch if the input is: a. 13 24 16.2 b. 45 $36 9.2 c. 16 #.75 72	User Input, cin and the Extraction Operator >>.					noorullah@superior.edu.pk

35	Suppose that height is a double variable, ch is a char variable, and name is a string variable. What are the values of height and name after the following input statements execute:
	cin >> height;
	cin.get(ch);
	getline(cin, name);
	if the input is:
	
	a. 5.4 Christy Miller
	b. 5.4 Christy Miller
		Input stream manipulation using the get function.	User Input, cin and the Extraction Operator >>.				noorullah@superior.edu.pk

36	Suppose that num is an int variable and discard is a char variable. Assume the following input data:
	#34
	What value (if any) is assigned to num and discard after each of the following statements executes? (Use the same input for each statement.):
	
	a. cin.get(discard);
	cin >> num;
	b. discard = cin.peek();
	cin >> num;
	
	c. cin.get(discard);
	cin.putback(discard);
	cin >> discard;
	cin >> num;
		Input stream manipulation using the peek function	Input stream manipulation using the putback function	Input stream manipulation using the get function.			noorullah@superior.edu.pk

37	int num1, num2, newNum;
	double x, y;
	Which of the following assignments are valid? If an assignment is not valid, state the reason.
	a. num1 = 35;
	b. newNum = num1 – num2;
	c. num1 = 5; num2 = 2 + num1; num1 = num2 / 3;
	d. num1 * num2 = newNum;
	e. x = 12 * num1 - 15.3;
	f. num1 * 2 = newNum + num2;
	g. x / y = x * y;
	h. num2 = num1 % 2.0;
	i. newNum = static_cast<int> (x) % 5;
	j. x = x + y - 5;
	k. newNum = num1 + static_cast<int> (4.6 / 2);
		Type Conversion (Casting)					noorullah@superior.edu.pk

38	Suppose a and b are int variables, c is a double variable, and a = 25, b = 20, and c = 5.0. What is the output of the following statements? a. cout << a * 2 * b << endl; b. cout << a + b / 2.0 + 1.5 * c << endl; c. cout << a / static_cast<double>(b) << endl; d. cout << 62 % 28 + a / c << endl; e. cout << static_cast<int>(c) % 3 + 7 << endl; f. cout << 22.5 / 2 + 14.0 * 3.5 + 28 << endl; g. cout << 2 / (c – static_cast<int>(c + 1.2))<< endl;	Type Conversion (Casting)					noorullah@superior.edu.pk

39	What is printed by the following program? Suppose the input is:
	35 10.5 27 B
	#include <iostream>
	using namespace std;
	const int NUM = 10;
	const double X = 20.5;
	int main()
	{
	int firstNum, secondNum;
	double z;
	char grade;
	firstNum = 62;
	cout << "firstNum = " << firstNum << endl;
	cout << "Enter three numbers: ";
	cin >> firstNum >> z >> secondNum;
	cout << endl;
	cout << "The numbers you entered are "
	<< firstNum << ", " << z << ", and "
	<< secondNum << endl;
	z = z - X + 2 * firstNum - secondNum;
	cout << "z = " << z << endl;
	cout << "Enter grade: ";
	cin >> grade;
	cout << endl;
	cout << "The letter that follows your grade is: "
	<< static_cast<char>(static_cast<int>(grade) + 1)
	<< endl;
	return 0;
	}
		Type Conversion (Casting)	User Input, cin and the Extraction Operator >>.				noorullah@superior.edu.pk

40	What is printed by the following program? Suppose the input is:
	Miller
	34
	62.5
	#include <iostream>
	#include <string>
	using namespace std;
	const double CONVERSION = 3.5;
	int main()
	{
	const int TEMP = 23;
	string name;
	int id;
	int num;
	double decNum;
	double mysteryNum;
	cout << "Enter last name: ";
	cin >> name;
	cout << endl;
	cout << "Enter a two digit integer: ";
	cin >> id;
	cout << endl;
	num = (id * TEMP) % (static_cast<int>(CONVERSION));
	cout << "Enter a decimal number: ";
	cin >> decNum;
	cout << endl;
	mysteryNum = decNum / CONVERSION - TEMP;
	cout << "Name: " << name << endl;
	cout << "Id: " << id << endl;
	cout << "Mystery number: " << mysteryNum << endl;
	return 0;
	}
		Type Conversion (Casting)	User Input, cin and the Extraction Operator >>.				noorullah@superior.edu.pk

41	Evaluate the following expressions: a. 4 * 7 == 74 / 3 b. 4 + 7 / 2 <= 9 - 15 % 6 c. 'K' < 'k' d. '+' <= '-' e. '5' <= '6' f. 3.9 / 4 - 6 >= 8 - 6.2 * 1.5	if statement.	Relational Operators.	Ascii Codes	Arithmetic operators (+, - , * /, %).		noorullah@superior.edu.pk

42	What is the output of the following statements?
	a. if ('+' < '-')
	cout << "+-";
	cout << "-+" << endl;
	
	b. if (12 / 2 == 4 + 1)
	cout << "6 ";
	cout << "12 / 2 != 4 + 1" << endl;
	
	c. if ('*' >= '/')
	cout << "/";
	cout << "*";
	cout << endl;
	
	d. if ("C++" <= "++C")
	cout << "C++" << endl;
	cout << "C++" << endl;
	
	e. if ("low" <= "high")
	cout << "low" << endl;
	cout << "high" << endl;
		if statement.	Relational Operators.	Ascii Codes			noorullah@superior.edu.pk

43	Write a program that takes an integer as input and prints "Even" if it's an even number and "Odd" if it's an odd number	If-else statement.					Ali Raza
44	Create a program that takes an integer as input and checks if it is positive, negative, or zero. Prints "Positive", "Negative", or "Zero" based on the input.	If-else statement.					Ali Raza
45	Develop a program that takes a number as user input and then checks if a given number is between 10 and 20 (inclusive) or between 30 and 40 (inclusive). The program should print either "10 to 20", "30 to 40", or "other range" based on user input.	If-else statement.	Logical operators.				Ali Raza
46	Create a program that takes a numerical age as input and checks if a person is eligible to vote. The voting age is 18 or older. The program should print "eligible" or "ineligible" based on the user input.	If-else statement.	Logical operators.				Ali Raza
47	Write a program that takes a numerical input and checks if the number is divisible by both 2 and 3. The program should print "divisible" or "indivisible" based on the user input.	If-else statement.	Logical operators.	Relational Operators.			Ali Raza
48	Write a program that takes two numbers as input and prints "Equal" if they are equal, "Greater" if the first number is greater, and "Smaller" if the first number is smaller.	Nested If-else statement.					Ali Raza

49	Write a program that takes a numerical year as input and checks whether the given year is a leap year or not. A leap year is divisible by 4, but not divisible by 100 unless it is divisible by 400. The progran should print "Leap year" or "Not leap year" based on the user input.	Nested If-else statement.	Logical operators.				Ali Raza
50	Write a program that takes the three angles of a triangle (in positive degrees) as numerical input and then clasifies the triangle as either "Acute" (all angles less than 90 degrees), "Obtuse" (one angle greater than 90 degrees), "Right" (one angle equal to 90 degrees), or "Invalid" (The sum of the angles is not equal to 180). The program should print the type of the triangle as classified above.	Nested If-else statement.					Ali Raza
51	Write a program that takes the exam score of a student as numerial input and then determines the grade of the student based on their exam score. Use the following grading scale: A (90-100), B (80-89), C (70-79), D (60-69), F (0-59). The program should print the grade according to the user input.	Nested If-else statement.					Ali Raza
52	Write a program using switch statement that takes a day of the week as input (e.g., 1 for Sunday, 2 for Monday, and so on) and prints the corresponding day.	Switch Statement					Ali Raza
53	Implement a program that takes a numerical month input and checks if it's a valid month (e.g., 1 for January, 2 for February, and so on). If valid, print the name of the month; otherwise, print "Invalid input"	Switch Statement					Ali Raza
54	Write a program that Inputs a number and finds whether it is even or odd using if-else structure. **Sample Input/Output** Enter a number: 5 It is odd.	If-else statement.	Relational Operators.	Arithmetic operators (+, - , * /, %).			Dr. Syed Asad Naqvi
55	Write a program that takes a character from the user and check whether it is UPPER case or LOWER case. **Hint:** ASCII Code for Upper case: 65 to 90, and for Lower case: 97 to 122	If-else statement.	Relational Operators.	Logical operators.			Dr. Syed Asad Naqvi
56	Write a program to check whether a triangle is valid or not. The program asks the user to enter three angles of the triangle and display the message 'Valid Triangle' if the triangle is valid, otherwise display 'Invalid Triangle'. **Hint:** A triangle is valid if the sum of all three angles is equal to 180 degrees.	If-else statement.	Arithmetic operators (+, - , * /, %).				Dr. Syed Asad Naqvi
57	Write a program which checks whether a character is an alphabet or not.	If-else statement.	Relational Operators.	Logical operators.			Dr. Syed Asad Naqvi
58	Fee structure of BS Computer Science in Superior University consists of a) Tuition fee: 9600 per credit hour b) Admission fee: 20000 (Once) c) Miscellaneous fee: 7500 per semester There are different scholarships available to the students (15% to 100%), which is applicable on tuition fee only. The admission fee and miscellaneous fee have to be paid fully. You are required to write a program that calculates the semester fee for a student. This program needs the following inputs: 1. The semester number for which the fee is being calculated. 2. The number of credit hours that the student has registered in the semester. 3. The scholarship percentage that the student avails (0 to 100) Please note that the admission fee only applies to the 1st semester, and if the total semester fee exceeds Rs. 100,000 then an additional 5% tax is added to it.	if statement.	Arithmetic operators (+, - , * /, %).				Dr. Syed Asad Naqvi
59	Write a program that will ask the user to input a 5 digit number, calculate the sum of the given 5 digits and display it. In case the user enters an invalid number (less than or greater than 5 digits) the program should display a message 'Sorry! The number you entered is NOT a 5 digit number'. **Hint:** Use modulus operator to extract digits from the number (5 digit number) See the output for different input numbers below: When the user enters 12345 Output: The sum of 5 digits is 15 When the user enters 11001 Output: The sum of 5 digits is 3 When the user enters 165 Output: Sorry! The number you entered is NOT a 5 digit number	Counter control loops	If-else statement.	Arithmetic operators (+, - , * /, %).			Dr. Syed Asad Naqvi
60	Write a C program to read an amount (integer value) and break the amount into the smallest possible number of bank notes. Note: The possible banknotes are 500, 100, 50, 20, 10, 5, 2, and 1	Condition controlled loops	If-else statement.				Dr. Syed Asad Naqvi
61	Write a program that converts an integer number (range 0-255) to its binary form. Print out binary in the following format: **Enter decimal no: 5** **Binary is: 101**	Condition controlled loops					Dr. Syed Asad Naqvi
62	Write a program that inputs a five-digit number from the user, and then reverses the number.	Condition controlled loops					Dr. Syed Asad Naqvi
63	Write a program which display the sum of whole part and decimal part of a float number Input decimal number = 7.8; Output => 15	Condition controlled loops					Dr. Syed Asad Naqvi
64	Write a program that displays "Pakistan" five times.	Counter control loops	For Loop				Dr. Syed Asad Naqvi
65	Write a program that displays counting from 1 to 10.	Counter control loops	For Loop				Dr. Syed Asad Naqvi
66	Write a program that displays the first five numbers and their sum.	Counter control loops	For Loop				Dr. Syed Asad Naqvi
67	Write a program that displays the first five numbers with their square.	Counter control loops	For Loop				Dr. Syed Asad Naqvi
68	Write a program that inputs a number from the user and display the factorial of that number.	Counter control loops	For Loop				Dr. Syed Asad Naqvi
69	Write a program that displays back counting from 10 to 1.	Counter control loops	For Loop				Dr. Syed Asad Naqvi
70	Write a program that displays the product of all odd numbers from 1 to 10.	For Loop	If-else statement.				Dr. Syed Asad Naqvi
71	Write a program in C++ to find the frequency of each digit in a given integer.	Single Dimensional Arrays	Condition controlled loops				Dr. Syed Asad Naqvi
72	Write a program in C++ to enter any number and print all factors of the number.	Counter control loops	For Loop	If-else statement.			Dr. Syed Asad Naqvi
73	Write a program in C++ that inputs an integer and prints a pattern of numbers as shown below. **Sample Input/Output:** Input number of rows: 5 1 12 123 1234 12345	Nested loop statements					Dr. Syed Asad Naqvi
74	Write a program in C++ that inputs an integer and prints a pattern of numbers as shown below. **Sample Input/Output:** Input number of rows: 5 1 22 333 4444 55555	Nested loop statements					Dr. Syed Asad Naqvi
75	Write a program in C++ that inputs an integer and prints a pattern of asterisks as shown below. **Sample Input/Output:** Input number of rows: 5 * ** *** **** *****	Nested loop statements					Dr. Syed Asad Naqvi

76	Write a program in C++ that inputs an integer and prints a pattern of asterisks as shown below. **Sample Input/Output:** Input number of rows: 5 * * * * * * * * * * * * * * *	Nested loop statements					Dr. Syed Asad Naqvi

77	Write a program in C++ that inputs an integer and prints a pattern of asterisks as shown below.
	Sample Input/Output:
	Input number of rows: 5
	  *
	  **
	  ***
	  ****
	*****
		Nested loop statements	Formatting output using the setw manipulator.				Dr. Syed Asad Naqvi

78	Write a program in C++ that inputs an integer and prints a pattern of asterisks as shown below.
	Sample Input/Output:
	Input number of rows: 5
	* * * * *
	  * * * *
	  * * *
	  * *
	  *
		Nested loop statements	Formatting output using the setw manipulator.				Dr. Syed Asad Naqvi

79	Write a program in C++ that inputs an integer and prints a pattern of numbers as shown below. Sample Input/Output: Input number of rows: 4 1 2 3 4 5 6 7 8 9 10	Nested loop statements					Dr. Syed Asad Naqvi
80	Write a program in C++ that inputs an integer and prints a pattern of characters as shown below. Sample Input/Output: Input number of rows: 4 A B B C C C D D D D E E E E E	Nested loop statements	Ascii Codes				Dr. Syed Asad Naqvi
81	**C++ Problem Statement:** Write a C++ program that takes a positive integer as input from the user and calculates its square root using the sqrt built-in function. Display the result. **Description of the code:** This C++ program takes a positive integer from the user, calculates its square root using the sqrt built-in function, and then displays the result. **Real-life Analogy and the Names of Topics Covered:** In real life, this is similar to using a calculator to find the square root of a number. The program covers the topic of using built-in functions (sqrt in this case) to perform specific tasks.	Built-in functions					Ms. Sanya Abdullah Computer Science-Visiting Faculty
82	Write a C++ program that calculates the area of a circle. The program should take the radius as input from the user and use the pow and M_PI built-in functions to perform the calculation. Display the result.	Built-in functions					Ms. Sanya Abdullah Computer Science-Visiting Faculty
83	**C++ Problem Statement:** Write a C++ program to perform basic string operations. The program should ask the user to enter two strings. Then, it should use string library functions to: 1. Concatenate the two strings. 2. Find the length of each string. 3. Compare if the strings are equal. 4. Display the result of each operation. **Description of the code:** This C++ program demonstrates various string library functions like strcat, strlen, and strcmp to perform concatenation, find lengths, and compare strings. **Real-life Analogy and the Names of Topics Covered:** In real life, this is similar to combining and comparing pieces of text or strings, which is a common operation in many applications.	String library functions					Ms. Sanya Abdullah Computer Science-Visiting Faculty
84	**C++ Problem Statement:** Write a C++ program to calculate the total cost of a shopping cart. Create a function ***float calculateTotal(float price, int quantity)*** that takes the price and quantity of an item as parameters. Use function call by value to calculate the total cost and display it in the main function. **Description of the code:** This C++ program demonstrates the concept of function call by value. The *calculateTotal* function takes the price and quantity of an item as parameters and calculates the total cost, which is then displayed in the main function. **Real-life Analogy and the Names of Topics Covered:** In real life, this scenario is similar to calculating the total cost of items in a shopping cart, where the price and quantity of each item contribute to the total.	Function Call by value					Ms. Sanya Abdullah Computer Science-Visiting Faculty
85	**C++ Problem Statement:** Create a C++ program to swap the values of two integers using a function called ***void swapNumbers(int& a, int& b)***. Implement this function using call by reference and display the swapped values in the main function. **Description of the code:** This C++ program demonstrates the use of function call by reference to swap the values of two integers. The ***swapNumbers*** function takes two integer references and swaps their values. **Real-life Analogy and the Names of Topics Covered:** In everyday situations, this is similar to swapping the positions of two items, like exchanging the positions of two books on a shelf.	Function Call by reference					Ms. Sanya Abdullah Computer Science-Visiting Faculty
86	**C++ Problem Statement:** Create a C++ program that includes two functions named: ***float calculateArea(float lengh, float width)*** and ***float calculateArea(float radious)***. One function calculates the area of a rectangle, and the other calculates the area of a circle. Implement function overloading for the ***calculateArea*** function to handle different shapes. Display the calculated areas in the main function. **Description of the code:** This C++ program showcases function overloading by defining two functions with the same name ***(calculateArea)*** but different parameter lists. One function calculates the area of a rectangle, while the other calculates the area of a circle. **Real-life Analogy and the Names of Topics Covered:** In the real world, this is akin to having a tool that can perform different functions based on its usage, like a multifunctional printer that can print, scan, and copy.	Function Overloading					Ms. Sanya Abdullah Computer Science-Visiting Faculty
87	**C++ Problem Statement:** Create a C++ program that defines a function named ***float calculateCost(float, int, float)*** to calculate the total cost of a product. The function should take three parameters: ***float pricePerUnit, int quantity, and float discountPercentage***. Implement default parameters for ***discountPercentage*** with a default value of ***0.0***. Display the calculated total cost in the main function. **Description of the code:** This C++ program demonstrates the use of default parameters in a function. The ***calculateCost*** function calculates the total cost, taking into account the price per unit, quantity, and an optional discount percentage. **Real-life Analogy and the Names of Topics Covered:** In real life, default parameters are like having a default setting on your preferences that you can modify if needed. For instance, ordering a meal with default options but having the flexibility to customize it.	Default parameters					Ms. Sanya Abdullah Computer Science-Visiting Faculty
88	**C++ Problem Statement:** Write a C++ program that implements a recursive function called ***int calculateFactorial(int)*** to calculate the factorial of a given positive integer. The program should take user input for the integer and use a recursive function to calculate its factorial. Display the result in the main function. The mathematical recursive definition of factorial is as follows: **N! = N x (N-1)! and 0! = 1** **Description of the code:** This C++ program demonstrates the use of recursive function calls to calculate the factorial of a given positive integer. The ***int calculateFactorial(int)*** function calls itself to solve smaller sub-problems until reaching the base case. **Real-life Analogy and the Names of Topics Covered:** Recursion in real life is like solving a complex problem by breaking it down into simpler tasks, similar to solving a puzzle by solving smaller pieces. The recursive function mimics this process in programming.	Recursive Function Calls					Ms. Sanya Abdullah Computer Science-Visiting Faculty
89	**C++ Problem Statement:** Write a C++ program that demonstrates the use of inline functions. Create a simple calculator program with inline functions for ***addition, subtraction, multiplication, and division***. The program should take user input for two numbers and perform these operations using inline functions. Display the results in the main function. **Description of the code:** This C++ program demonstrates the use of inline functions for basic arithmetic operations. The inline functions ***(add, subtract, multiply, and divide)*** are simple and executed directly in the calling code. **Real-life Analogy and the Names of Topics Covered**: Inline functions in C++ are similar to macros; they provide a way to insert a function's code directly into the calling code. This is analogous to having a set of handy tools available directly at the location where you need them.	Inline functions					Ms. Sanya Abdullah Computer Science-Visiting Faculty

90	**C++ Problem Statement:** Create a C++ program that showcases the use of local variables in different scopes. Define a global variable, and then create a function with its own local variable having the same name. Demonstrate how local variables in different scopes do not conflict and illustrate the concept of shadowing. **Description of the code:** This C++ program demonstrates the use of local variables in different scopes. It defines a global variable and then creates a function with its own local variable having the same name. The main function illustrates that local variables in different scopes do not conflict, and it introduces the concept of shadowing. **Real-life Analogy and the Names of Topics Covered:** Local variables are similar to personal belongings in different rooms of a house. Even if you have items with the same name in different rooms, they don't interfere with each other, and you can refer to them separately.	Local variables					Ms. Sanya Abdullah Computer Science-Visiting Faculty
91	Write a function called ***void countMe()*** that uses a global variable to count and display the number of time that it has been called. ***void countMe()*** should display the call count from within the function. Call this function several times in ***main()*** to see if it correctly counts and displays the number of calls.	Global variables					Dr. Syed Asad Naqvi
92	Write a function called ***void countMeStatic()*** that uses a "static" variable to count and display the number of time that it has been called. ***void countMeStatic()*** should display the call count from within the function. Call this function several times in ***main()*** to see if it correctly counts and displays the number of calls.	Lifetime of Variables.					Dr. Syed Asad Naqvi
93	Write a program that reads from the user two arrays of the same size: Array A: contains double numbers representing the students' lab marks Array B: contains integer numbers representing the total absences for each student. The program then calls a function called (calcTotal) that will take array A and B as an input and returns an array C of type double that contains the result of subtracting each element in B from the corresponding element in A. Ex: Array A: 78.0 90.0 55.5 85.7 99.0 Array B 5 3 2 0 3 Array C 73.0 87.0 53.5 85.7 96.0	Arrays as Parameters to Functions	Single Dimensional Arrays				zeeshan mubeen
94	Write a C++ program to get 15 POSITIVE integer values from user and • Store these values into an array if and only if the new value does not exist into the array. • If the value exists into the array and array is not full, your program should display "Sorry: Value Already Exist".	Single Dimensional Arrays					zeeshan mubeen
95	(Find the minimum value in an array) Write a function that takes an integer array and the array size as arguments and returns the smallest element of the array. The function should stop processing and return when it receives an array of one element.	Arrays as Parameters to Functions	Single Dimensional Arrays				zeeshan mubeen
96	(Prime Numbers) An integer is said to be prime if it's divisible by only 1 and itself. For example, 2, 3, 5 and 7 are prime, but 4, 6, 8 and 9 are not. Write a function that takes integer input from the user and stores it in an array only if the number is a prime number. The function should stop taking user input after it has stored 10 prime numbers in the array. Your program should display the stored prime numbers before terminating.	Arrays as Parameters to Functions	Single Dimensional Arrays				zeeshan mubeen
97	Write a program that takes an integer array 'A' and an integer 'x' as input and searches for 'x' in the array. If 'x' is found, print the index of 'x'. If 'x' is not found, then print -1. If 'x' is present two or more than two times in the array, then print the index of last occurrence of 'x'.	Single Dimensional Arrays					zeeshan mubeen
98	Write a program in C++ which declares a 2D array of size 3 by 5, take input from the user in 2D array and show the output in matrix form.	Two dimensional arrays					zeeshan mubeen
99	Write a C++ program to find the length of a string input by user. For example, length of "Ahmed Ali" is 9.	Using arrays as a character string					zeeshan mubeen
100	Write a C++ program to take user name as input and print his/her name in reverse order. For example, reverse of "Ahmed Ali" is "ilA demhA".	Using arrays as a character string					zeeshan mubeen
101	Write a C++ program that asks user to enter a string and a character and this program checks how many times that character is repeated in the string entered by user.	Using arrays as a character string					zeeshan mubeen
102	Write a program that initialized a 2-D array of 2 rows and 3 columns and then display its values.	Two dimensional arrays					zeeshan mubeen
103	Write a program that initialized a 2-D array of 4 rows and 2 columns and then display the minimum and maximum number	Two dimensional arrays					zeeshan mubeen
104	write a C++ Program to store temperature of two different cities for a week, in a 2D array, and display it.	Two dimensional arrays					zeeshan mubeen
105	Write a program to add two matrices of 3*3 order and store the result in a third 3*3 matrix then display the result in 3rd matrix	Two dimensional arrays					zeeshan mubeen

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