Question 1

CP - Create a program to print a multiplication table of a number.

Hint =>

1. Get an integer input and store it in the number variable. Also, define an integer array to store the results of multiplication from 1 to 10
2. Run a loop from 1 to 10 and store the results in the multiplication table array
3. Finally, display the result from the array in the format number * i = ___

Question 2

CP - Write a program to take user input for 5 numbers and check whether a number is positive, negative, or zero. Further, for positive numbers check if the number is even or odd. Finally, compare the first and last elements of the array and display if they equal, greater or less

Hint =>

1. Define an integer array of 5 elements and get user input to store in the array.
2. Loop through the array using the length. If the number is positive, check for even or odd numbers and print accordingly
3. If the number is negative, print negative. Else if the number is zero, print zero.
4. Finally, compare the first and last element of the array and display if they equal, greater or less

Question 3

CP - Create a program to save odd and even numbers into odd and even arrays between 1 to the number entered by the user. Finally, print the odd and even numbers array

Hint =>

1. Get an integer input from the user, assign it to a variable number, and check for a Natural Number. If not a natural number, then print an error and exit the program
2. Create an integer array for even and odd numbers with size = number / 2 + 1
3. Create index variables for odd and even numbers and initialize them to zero
4. Using a for loop, iterate from 1 to the number, and in each iteration of the loop, save the odd or even number into the corresponding array
5. Finally, print the odd and even numbers array using the odd and even index

Question 4

CP - Write a program FizzBuzz, take a number as user input and if it is a positive integer loop from 0 to the number and save the number, but for multiples of 3 save "Fizz" instead of the number, for multiples of 5 save "Buzz", and for multiples of both save "FizzBuzz". Finally, print the array results for each index position in the format Position 1 = 1, …, Position 3 = Fizz,...

Hint =>

1. Create a String Array to save the results and
2. Finally, loop again to show the results of the array based on the index position

Question 5

CP - Working with Multi-Dimensional Arrays. Write a Java program to create a 2D Array and copy the 2D Array into a single dimension array

Hint =>

1. Take user input for rows and columns, create a 2D array (Matrix), and take the user input
2. Copy the elements of the matrix to a 1D array. For this, create a 1D array of size rows*columns as in
   int[] array = new int[rows * columns];
3. Define the index variable and Loop through the 2D array. Copy every element of the 2D array into the 1D array and increment the index
4. Note: For looping through the 2D array, you will need a Nested for loop, an Outer for loop for rows, and an inner for loop to access each element

Question 6

CP - Write a program to store multiple values in an array up to a maximum of 10 or until the user enters a 0 or a negative number. Show all the numbers as well as the sum of all numbers

Hint =>

1. Create a variable to store an array of 10 elements of type double and a variable to store the total of type double initializes to 0.0. Also, the index variable is initialized to 0 for the array
2. Use infinite while loop as in ***while (true)***
3. Take the user entry and check if the user entered 0 or a negative number to break the loop
4. Also, ***break*** from the loop if the index has a value of 10 as the array size is limited to 10.
5. If the user entered a number other than 0 or a negative number inside the while loop then assign the number to the array element and increment the index value
6. Take another ***for*** loop to get the values of each element and add it to the total

7. Finally display the total value

Question 7

CP - Create a program to find the multiplication table of a number entered by the user from 6 to 9 and display the result

Hint =>

1. Take integer input and store it in the variable number, as well as define an integer array to store the multiplication result in the variable multiplicationResult
2. Using a for loop, find the multiplication table of numbers from 6 to 9 and save the result in the array
3. Finally, display the result from the array in the format number * i = ____

Question 8

CP - Write a program to take user input for the age of all 10 students in a class and check whether the student can vote depending on his/her age is greater or equal to 18.

Hint =>

1. Define an array of 10 integer elements and take user input for the student's age.
2. Loop through the array using the length property and for the element of the array check If the age is a negative number print an invalid age and if 18 or above, print The student with the age ____ can vote. Otherwise, print The student with the age ____ cannot vote.

Question 9

CP - Create a program to find the factors of a number taken as user input, store the factors in an array, and display the factors

Hint =>

1. Take the input for a number
2. Find the factors of the number and save them in an array. For this, create an integer variable maxFactor and initialize it to 10, the factors array of size maxFactor and the index variable to reflect the index of the array.
3. To find factors, loop through the numbers from 1 to the number, find the factors, and add them to the array element by incrementing the index. If the index is equal to maxIndex, then the need factors array to store more elements

4. To store more elements, reset the maxIndex to twice its size, use the temp array to store the elements from the factors array, and eventually assign the factors array to the temp array
5. Finally, display the factors of the number

Question 10

CP - Create a program to find the mean height of players in a football team.

Hint =>

1. The formula to calculate the mean is: mean = sum of all elements/number of elements
2. Create a double array named heights of size 11 and get input values from the user.
3. Find the sum of all the elements present in the array.
4. Divide the sum by 11 to find the mean height and print the mean height of the football

Question 11

CP - Create a program to take a number as input, find the frequency of each digit in the number using an array, and display the frequency of each digit

Hint =>

1. Take the input for a number
2. Find the count of digits in the number
3. Find the digits in the number and save them in an array
4. Find the frequency of each digit in the number. For this, define a frequency array of size 10, Loop through the digits array, and increase the frequency of each digit
5. Display the frequency of each digit in the number

Question 12

CP - Create a program to find the youngest friends among 3 Amar, Akbar, and Anthony based on their ages, and the tallest among the friends based on their heights

Hint =>

1. Take user input for age and height for the 3 friends and store it in two arrays, each to store the values for age and height of the 3 friends
2. Loop through the array and find the youngest of the 3 friends and the tallest of the 3 friends
3. Finally display the youngest and tallest of the 3 friends

Question 13

CP - An organization took up an exercise to find the Body Mass Index (BMI) of all the team members. For this, create a program to find the BMI and display the height, weight, BMI, and status of each individual

Hint =>

1. Take input for the number of persons

2. Create arrays to store the weight, height, BMI, and weight status of the persons

3. Take input for the weight and height of the person

4. Calculate the BMI of all the persons and store them in an array, and also find the weight status of the persons

5. Display the height, weight, BMI, and weight status of each person

6. Use the table to determine the weight status of the person

BMI	Status
≤ 18.4	Underweight
18.5 - 24.9	Normal
25.0 - 39.9	Overweight
≥ 40.0	Obese

Question 14

CP - Create a program to take input marks of students in the 3 subjects physics, chemistry, and maths. Compute the percentage and then calculate the grade as per the following guidelines

Grade	Remarks	Marks
A	(Level 4, above agency-normalized standards)	80% and above
B	(Level 3, at agency-normalized standards)	70-79%
C	(Level 2, below, but approaching agency-normalized standards)	60-69%
D	(Level 1, well below agency-normalized standards)	50-59%
E	(Level 1- , too below agency-normalized standards)	40-49%
R	(Remedial standards)	39% and below

Hint =>

1. Take input for the number of students
2. Create arrays to store marks, percentages, and grades of the students
3. Take input for marks of students in physics, chemistry, and maths. If the marks are negative, ask the user to enter positive values and decrement the index
4. Calculate the percentage and grade of the students based on the percentage
5. Display the marks, percentages, and grades of each student

Question 15

CP - Create a program to take a number as input and reverse the number. To do this, store the digits of the number in an array and display the array in reverse order

Hint =>

1. Take user input for a number.
2. Find the count of digits in the number.
3. Find the digits in the number and save them in an array
4. Create an array to store the elements of the digits array in reverse order
5. Finally, display the elements of the array in reverse order

Question 16

CP - Create a program to take input marks of students in the 3 subjects physics, chemistry, and maths. Compute the percentage and then calculate the grade as per the following guidelines. Store the marks of the students in physics, chemistry, and maths in a 2D array and then compute the percentage and grade

Grade	Remarks	Marks
A	(Level 4, above agency-normalized standards)	80% and above
B	(Level 3, at agency-normalized standards)	70-79%
C	(Level 2, below, but approaching agency-normalized standards)	60-69%
D	(Level 1, well below agency-normalized standards)	50-59%
E	(Level 1- , too below agency-normalized standards)	40-49%
R	(Remedial standards)	39% and below

Hint =>

1. Take input for the number of students
2. Create arrays to store marks, percentages, and grades of the students
3. Take input for marks of students in physics, chemistry, and maths. If the marks are negative, ask the user to enter positive values and decrement the index. Store the marks in the 2D array
4. Use the 2D array to calculate the percentages, and the grades of the students
5. Display the marks, percentages, and grades of each student

Question 17

CP - Create a program to store the digits of the number in an array and find the largest and second largest element of the array.

Hint =>

1. Create a number variable and take user input.
2. Define an array to store the digits. Set the size of the array to the maxDigit variable initially set to 10
3. Create an integer variable index with the value 0 to reflect the array index.
4. Use a loop to iterate until the number is not equal to 0.
5. Remove the last digit from the number in each iteration and add it to the array.
6. Increment the index by 1 in each iteration, and if the index count equals maxDigit, increase maxDigit and create a new temp digits array of size maxDigits and copy the current digits to the temp array. Post that make the current digits array as the temp array.
7. Define a variable to store the largest and second largest digit and initialize it to zero
8. Loop through the array and use conditional statements to find the largest and second largest number in the array
9. Finally display the largest and second-largest number

Question 18

CP - Create a program to find the bonus of 10 employees based on their years of service and the total bonus amount the company Zara has to pay, along with the old and new salary.

Hint =>

1. Zara decides to give a bonus of 5% to employees whose year of service is more than 5 years or 2% if less than 5 years
2. Define a double array to save salary and years of service for each of the 10 employees
3. Also define a double array to save the new salary and the bonus amount, as well as variables to save the total bonus, the total old salary, and the new salary
4. Define a loop to take input from the user. If salary or year of service is an invalid number, then ask the user to enter again. Note, in this case, you will have to decrement the index counter
5. Define another loop to calculate the bonus of 10 employees based on their years of service. Save the bonus in the array, compute the new salary, and save in the array. Also, the total bonus and total old and new salary can be calculated in the loop
6. Print the total bonus payout as well as the total old and new salary of all the employees

Question 19

CP - Create a program to store the digits of the number in an array and find the largest and second largest element of the array.

Hint =>

1. Create a number variable and take user input.
2. Define an array to store the digits. Set the size of the array to the maxDigit variable initially set to 10
3. Create an integer variable index with the value 0 to reflect the array index.
4. Use a loop to iterate until the number is not equal to 0.
5. Remove the last digit from the number in each iteration and add it to the array.
6. Increment the index by 1 in each iteration, and if the index count equals maxDigit, then break out of the loop, and the remaining digits are not added to the array
7. Define a variable to store the largest and second largest digit and initialize it to zero
8. Loop through the array and use conditional statements to find the largest and second largest number in the array
9. Finally display the largest and second-largest number

Question 20

CP - An organization took up an exercise to find the Body Mass Index (BMI) of all the team members. For this, create a program to find the BMI and display the height, weight, BMI, and status of each individual. Use a multi-dimensional array to store height, weight, and BMI in the 2D array for all the persons

Hint =>

1. Take input for the number of persons and create a multi-dimensional array to store weight, height, and BMI. Also create a to store the weight status of the persons

```
double[][] personData = new double[number][3];
String[] weightStatus = new String[number];
```

2. Take input for weight and height of the person, and for negative values, ask the user to enter positive values

3. Calculate BMI of all the persons and store them in the personData array, and also find the weight status and put them in the weightStatus array

4. Display the height, weight, BMI, and status of each person

5. Use the table to determine the weight status of the person

BMI	Status
≤ 18.4	Underweight
18.5 - 24.9	Normal
25.0 - 39.9	Overweight
≥ 40.0	Obese