Tasks:

1. Create a class to output "good morning" using a text editor and check output.
2. Create a new Project in Intelij Idea and output "subscribe" on the console.
3. Show the following patterns:

CHALLENGE

Task:

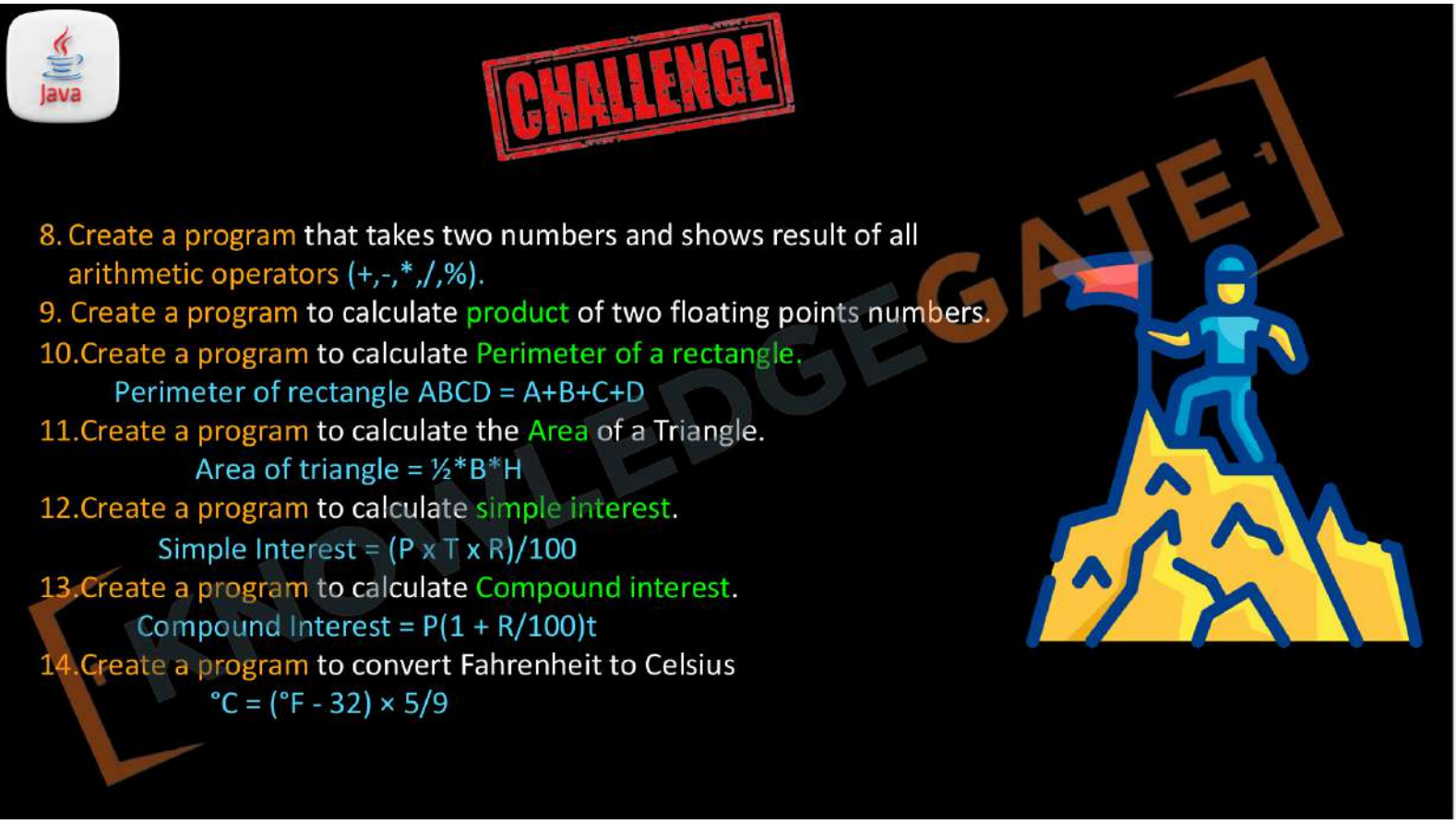
4. Show the following patterns using single print statement:

CHALLENGE

5.Create a program to input name of the person and respond with "Welcome NAME to KG Coding"

6.Create a program to add two numbers.


Java
CHALLENGE
7. Create a program to swap two numbers.
KNOWLEDGEGATE


Java
CHALLENGE
8. Create a program that takes two numbers and shows result of all arithmetic operators (+,-,*,/,%).
9. Create a program to calculate product of two floating points numbers.
10. Create a program to calculate Perimeter of a rectangle.
Perimeter of rectangle ABCD = A+B+C+D
11. Create a program to calculate the Area of a Triangle.
Area of triangle = ½*B*H
12. Create a program to calculate simple interest.
Simple Interest = (P x T x R)/100
13. Create a program to calculate Compound interest.
Compound Interest = P(1 + R/100)t
14. Create a program to convert Fahrenheit to Celsius
°C = (°F - 32) × 5/9
KNOWLEDGE GATE

CHALLENGE

15.Create a program that determines if a number is positive, negative, or zero.

16.Create a program that determines if a number is odd or even.

17. Create a program that determines the greatest of the three numbers.

18.Create a program that determines if a given year is a leap year (considering conditions like divisible by 4 but not 100, unless also divisible by 400).

19.Create a program that calculates grades based on marks

A -> above 90% B -> above 75%

C -> above 60% D -> above 30%

F -> below 30%

20.Create a program that categorize a person into different age groups

Child -> below 13 Teen -> below 20

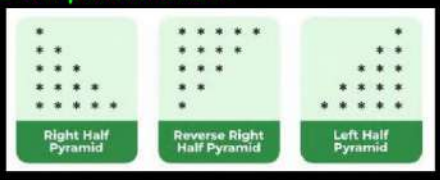
Adult -> below 60 Senior-> above 60

CHALLENGE

21. Create a program that shows bitwise AND of two numbers.
22. Create a program that shows bitwise OR of two numbers.
23. Create a program that shows bitwise XOR of two numbers.
24. Create a program that shows bitwise compliment of a number.
25. Create a program that shows use of left shift operator.
26. Create a program that shows use of right shift operator.
27. Write a program to check if a given number is even or odd using bitwise operators.

CHALLENGE

28. Develop a program that prints the multiplication table for a given number.
29. Create a program to sum all odd numbers from 1 to a specified number N.
30. Write a function that calculates the factorial of a given number.
31. Create a program that computes the sum of the digits of an integer.
32. Create a program to find the Least Common Multiple (LCM) of two numbers.
33. Create a program to find the Greatest Common Divisor (GCD) of two integers.
34. Create a program to check whether a given number is prime.
35. Create a program to reverse the digits of a number.
36. Create a program to print the Fibonacci series up to a certain number.
37. Create a program to check if a number is an Armstrong number.
38. Create a program to verify if a number is a palindrome.
39. Create a program that print patterns:



CHALLENGE

40. Create a program to find the sum and average of all elements in an array.
41. Create a program to find number of occurrences of an element in an array.
42. Create a program to find the maximum and minimum element in an array.
43. Create a program to check if the given array is sorted.
44. Create a program to return a new array deleting a specific element.
45. Create a program to reverse an array.
46. Create a program to check is the array is palindrome or not.
47. Create a program to merge two sorted arrays.
48. Create a program to search an element in a 2-D array.
49. Create a program to do sum and average of all elements in a 2-D array.
50. Create a program to find the sum of two diagonal elements.

CHALLENGE

51. Create a Book class for a library system.
    - Instance variables: title, author, isbn.
    - Static variable: totalBooks, a counter for the total number of book instances.
    - Instance methods: borrowBook(), returnBook().
    - Static method: getTotalBooks(), to get the total number of books in the library.
52. Design a Course class.
    - Instance variables: courseName, enrolledStudents.
    - Static variable: maxCapacity, the maximum number of students for any course.
    - Instance methods: enrollStudent(String studentName), unenrollStudent(String studentName).
    - Static method: setMaxCapacity(int capacity), to set the maximum capacity for courses.

CHALLENGE

53. Create a program to find the minimum of two numbers.
54. Create a program to find if the given number is even or odd.
55. Create a program to calculate the absolute value of a given integer.
56. Create a program to Based on a student's score, categorize as "High", "Moderate", or "Low" using the ternary operator (e.g., High for scores > 80, Moderate for 50-80, Low for < 50).
57. Create a program to print the month of the year based on a number (1-12) input by the user.
58. Create a program to create a simple calculator that uses a switch statement to perform basic arithmetic operations like addition, subtraction, multiplication, and division.

CHALLENGE

59. Create a program using do-while to find password checker until a valid password is entered.
60. Create a program using do-while to implement a number guessing game.
61. Create a program using for loop multiplication table for a number.
62. Create a program using for to display if a number is prime or not.
63. Create a program using for-each to find the maximum value in an integer array.
64. Create a program using for-each to the occurrences of a specific element in an array.
65. Create a program using break to read inputs from the user in a loop and break the loop if a specific keyword (like "exit") is entered.
66. Create a program using continue to sum all positive numbers entered by the user; skip any negative numbers.
67. Create a program using continue to print only even numbers using continue for odd numbers.
68. Create a program using recursion to display the Fibonacci series upto a certain number.
69. Create a program using recursion to check if a string is a palindrome using recursion.

CHALLENGE

70. Define a Student class with fields like name and age, and use toString to print student details.
71. Concatenate and Convert: Take two strings, concatenate them, and convert the result to uppercase.
72. Calculate the area and circumference of a circle for a given radius using Math.PI
73. Simulate a dice roll using Math.random() and display the outcome (1 to 6).
74. Create a number guessing game where the program selects a random number, and the user has to guess it.
75. Take an array of words and concatenate them into a single string using StringBuilder.
76. Create an object with final fields and a constructor to initialize them.

CHALLENGE

77. Create a simple application with at least two packages: com.example.geometry and com.example.utils. In the geometry package, define classes like Circle and Rectangle. In the utils package, create a Calculator class that can compute areas of these shapes.
78. Define a BankAccount class with private attributes like accountNumber, accountHolderName, and balance. Provide public methods to deposit and withdraw money, ensuring that these methods don't allow illegal operations like withdrawing more money than the current balance.
79. Define a class Employee with private attributes (like name, age, and salary), public methods to get and set these attributes, and a package-private method to displayEmployeeDetails. Create another class in the same package to test access to the displayEmployeeDetails method.

CHALLENGE

80. Start with a base class LibraryItem that includes common attributes like itemID, title, and author, and methods like checkout() and returnItem(). Create subclasses such as Book, Magazine, and DVD, each inheriting from LibraryItem. Add unique attributes to each subclass, like ISBN for Book, issueNumber for Magazine, and duration for DVD.

81. Create a class Person with attributes name and age. Override equals() to compare Person objects based on their attributes. Override hashCode() consistent with the definition of equals().

82. Create a class ArrayOperations with a static nested class Statistics. Statistics could have methods like mean(), median(), which operate on an array.

CHALLENGE

83. Create an abstract class Shape with an abstract method calculateArea(). Implement two subclasses: Circle and Square. Each subclass should have relevant attributes (like radius for Circle, side for Square) and their own implementation of the calculateArea() method.

84. Create an interface Flyable with an abstract method fly(). Create an abstract class Bird that implements Flyable. Implement a subclass Eagle that extends Bird. Provide an implementation for the fly() method.

CHALLENGE

85. In a class Calculator, create multiple add() methods that overload each other and can sum two integers, three integers, or two doubles. Demonstrate how each can be called with different numbers of parameters.

86. Define a base class Vehicle with a method service() and a subclass Car that overrides service(). In Car's service(), provide a specific implementation that calls super.service() as well, to show how overriding works.

CHALLENGE

87. Arithmetic Exception Handling

Write a program that asks the user to enter two integers and then divides the first by the second. The program should handle any arithmetic exceptions that may occur (like division by zero) and display an appropriate message.

Key Points:

- Use Scanner to read user input.
- Implement a try-catch block to handle ArithmeticException.
- Display a user-friendly message if division by zero occurs.

CHALLENGE

88. File Not Found Exception Handling

Write a program to read a filename from the user and display its content. The program should handle the situation where the file does not exist.

Key Points:

- Use Scanner to read the filename from the user.
- Use FileReader to read the file content.
- Implement a try-catch block to handle FileNotFoundException.
- Display a message informing the user if the file is not found.

CHALLENGE

89. Write a method concatenate Strings that takes variable arguments of String type and concatenates them into a single string.
90. Write a program that sorts a list of String objects in descending order using a custom Comparator.
91. Use the Collections class to count the frequency of a particular element in an ArrayList.
92. Write a method that swaps two elements in an ArrayList, given their indices.
93. Create a program that reverses the elements of a List and prints the reversed list.
94. Create a PriorityQueue of a custom class Student with attributes name and grade. Use a comparator to order by grade.
95. Write a program that takes a string and returns the number of unique characters using a Set.