

1. Write a Java class, **ComputeDisplacement**, in which the method 'main' takes three double command-line arguments x_0 , v_0 , and t and prints the value of $x_0 + v_0 \cdot t - (g \cdot t^2)/2$, where g is the constant 9.80665. (Note: This value is the displacement in meters after t seconds when an object is thrown straight up from initial position x_0 at velocity v_0 meters per second.) [10 points]
2. Write a Java class, **LargeToSmall**, in which the method 'main' asks user to enter 3 integers and then prints out the value that is largest value taken to the power of the smallest value. For instance, when the user enters 3, 2, 5, the program shall output 25 ($= 5^2$). [10 points]
3. Write a Java class, **RandomAverage**, in which the method 'main' generates five uniform random numbers between 0 and 1, print their average value, their minimum and maximum values. Hint: Use `Random.nextDouble()`, `Math.min()`, and `Math.max()`. [10 points]
4. Write a Java class, **SentinelValue**, in which the method 'main' allows user to enter (input) a set of salary values and output the average salary. The programme terminates when '-1' is input by user. The salary cannot be negative, so '-1' is a reasonable sentinel. [6 points]
5. Write a Java class, **IsItSameRow**, in which the method 'main' allows user to input an English word and checks whether the word can be typed by the characters which are in the same row on a keyboard, and prints "Yes" or "No" accordingly. For instance, 'light' cannot be typed in the same row, but 'utter' can. Hints: You may create three Boolean variables (e.g. row1, row2, and row3) that keep track of whether a letter in Word occurs in a particular row. They should initially be set to False. [6 points]
6. Write a Java class, **ConsecutiveFour**, in which the method 'main' checks whether an array has four consecutive numbers with the same value. The method prompts the user to enter the input size—i.e., the number of values in the series, and followed by a series of integers. [5 points]

Here are sample runs:

Sample 1: Enter the number of values: 8
Enter the values: 3 4 5 5 5 5 4 5
The list has consecutive fours

Sample 2: Enter the number of values: 9
Enter the values: 3 4 5 5 6 5 5 4 5
The list has no consecutive fours

7. Write a Java class, **DotProduct**, in which the method 'main' multiply two *rectangular* matrices that are not necessarily square. Note that (1) For the dot product to be well defined, the number of columns in the first matrix must be equal to the number of rows in the second matrix. Print an error message if the dimensions do not satisfy this condition. (2) Use two-dimensional array to represent two matrices with all integer elements. You may initialize the matrices in your codes. (3) The multiplication of two matrices is a matrix too. In your code, just print the first row and the last row of elements. [5 points]