

<b>Subject: Professional Development Skills</b>	<b>Lecture - 3</b>	<b>Date: 25.12.2024 / Wednesday</b>	<b>No. of Programs : 04</b>
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If the marks obtained by a Student in five different subjects are input, write a c , java, python program to find the aggregate marks and percentage marks obtained by the student assuming the maximum marks as 100.

<b>C</b>	<b>JAVA</b>	<b>PYTHON</b>
<pre>#include &lt;stdio.h&gt;  int main() {     int m1, m2, m3, m4, m5, sum;     float percentage;      printf("Enter marks of 5 subjects (out of 100):\n");     scanf("%d %d %d %d %d", &amp;m1, &amp;m2, &amp;m3, &amp;m4, &amp;m5);      sum = m1 + m2 + m3 + m4 + m5;     percentage = (float)sum / 5;      printf("Aggregate Marks: %d\n", sum);     printf("Percentage Marks: %.2f%%\n", percentage);      return 0; }</pre>	<pre>import java.util.Scanner;  public class StudentMarks {     public static void main(String[] args) {         Scanner scanner = new Scanner(System.in);          System.out.println("Enter marks of 5 subjects (out of 100):");         int m1 = scanner.nextInt();         int m2 = scanner.nextInt();         int m3 = scanner.nextInt();         int m4 = scanner.nextInt();         int m5 = scanner.nextInt();          int sum = m1 + m2 + m3 + m4 + m5;         float percentage = (float) sum / 5;          System.out.println("Aggregate Marks: " + sum);         System.out.printf("Percentage Marks: %.2f%%\n", percentage);          scanner.close();    } }</pre>	<pre>def main():     print("Enter marks of 5 subjects (out of 100):")     m1 = int(input())     m2 = int(input())     m3 = int(input())     m4 = int(input())     m5 = int(input())      total = m1 + m2 + m3 + m4 + m5     percentage = total / 5      print(f"Aggregate Marks: {total}")     print(f"Percentage Marks: {percentage:.2f}%")  if __name__ == "__main__":     main()</pre>
<p><b>Time Complexity</b></p> <ol style="list-style-type: none"> <li><b>Input:</b> Each mark is entered individually (<math>O(1)</math> per input). Since there are 5 inputs, the total time complexity for input is <math>O(1)</math> as it's a constant size.</li> <li><b>Computation:</b> Adding 5 values is <math>O(1)</math>, and calculating the percentage is also <math>O(1)</math>. <b>Overall: <math>O(1)</math>.</b></li> </ol> <p><b>Space Complexity</b></p> <ul style="list-style-type: none"> <li><b>Variables:</b> Only individual variables (m1, m2, m3, m4, m5) are used for input, plus sum and percentage for computation. <b>Overall: <math>O(1)</math>.</b></li> </ul>		

Temperature of a city in foreign degrees is input, write a c, java, python program to convert this temperature into centigrade degrees.

C	JAVA	PYTHON
<pre>#include &lt;stdio.h&gt;  int main() {     float fahrenheit, celsius;      printf("Enter temperature in Fahrenheit: ");     scanf("%f", &amp;fahrenheit);      celsius = (5.0 / 9.0) * (fahrenheit - 32);     printf("Temperature in Celsius: %.2f\n", celsius);      return 0; }</pre>	<pre>import java.util.Scanner;  public class TemperatureConverter {     public static void main(String[] args) {         Scanner scanner = new Scanner(System.in);          System.out.print("Enter temperature in         Fahrenheit: ");         float fahrenheit = scanner.nextFloat();          float celsius = (5.0f / 9.0f) * (fahrenheit - 32);         System.out.printf("Temperature in Celsius:         %.2f\n", celsius);          scanner.close();     } }</pre>	<pre>def main():     fahrenheit = float(input("Enter temperature in     Fahrenheit: "))     celsius = (5.0 / 9.0) * (fahrenheit - 32)     print(f"Temperature in Celsius: {celsius:.2f}")  if __name__ == "__main__":     main()</pre>
<p><b>Time Complexity:</b></p> <ul style="list-style-type: none"> <li>Only one temperature conversion formula is applied, which involves subtraction and multiplication/division.</li> <li>Input and output operations are constant.</li> </ul> <p><b>Space Complexity:</b></p> <ul style="list-style-type: none"> <li>Only a few variables are used for computation.</li> </ul>		
<p><b>Overall Time Complexity: O(1).</b></p> <p><b>Overall Space Complexity: O(1).</b></p>		

**The length and breadth of a rectangle and radius of a circle is input, write a c, java, python program to calculate area , perimeter of rectangle and the area , circumference of the circle.**

C	JAVA	PYTHON
<pre>#include &lt;stdio.h&gt; #define PI 3.14159  int main() {     float length, breadth, radius;     float rect_area, rect_perimeter, circle_area,     circle_circumference;      printf("Enter length and breadth of the rectangle: ");     scanf("%f %f", &amp;length, &amp;breadth);      printf("Enter radius of the circle: ");     scanf("%f", &amp;radius);      rect_area = length * breadth;     rect_perimeter = 2 * (length + breadth);     circle_area = PI * radius * radius;     circle_circumference = 2 * PI * radius;      printf("Rectangle Area: %.2f\n", rect_area);     printf("Rectangle Perimeter: %.2f\n", rect_perimeter);     printf("Circle Area: %.2f\n", circle_area);     printf("Circle Circumference: %.2f\n", circle_circumference);      return 0; }</pre>	<pre>import java.util.Scanner;  public class GeometryCalculator {     public static void main(String[] args) {         Scanner scanner = new Scanner(System.in);          System.out.print("Enter length and breadth of the rectangle: ");         float length = scanner.nextFloat();         float breadth = scanner.nextFloat();          System.out.print("Enter radius of the circle: ");         float radius = scanner.nextFloat();          float rectArea = length * breadth;         float rectPerimeter = 2 * (length + breadth);         float circleArea = (float) Math.PI * radius * radius;         float circleCircumference = 2 * (float) Math.PI * radius;          System.out.printf("Rectangle Area: %.2f\n", rectArea);         System.out.printf("Rectangle Perimeter: %.2f\n", rectPerimeter);         System.out.printf("Circle Area: %.2f\n", circleArea);         System.out.printf("Circle Circumference: %.2f\n", circleCircumference);          scanner.close();    }}</pre>	<pre>def main():     length = float(input("Enter length of the rectangle: "))     breadth = float(input("Enter breadth of the rectangle: "))     radius = float(input("Enter radius of the circle: "))      rect_area = length * breadth     rect_perimeter = 2 * (length + breadth)     circle_area = 3.14159 * radius**2     circle_circumference = 2 * 3.14159 * radius      print(f"Rectangle Area: {rect_area:.2f}")     print(f"Rectangle Perimeter: {rect_perimeter:.2f}")     print(f"Circle Area: {circle_area:.2f}")     print(f"Circle Circumference: {circle_circumference:.2f}")  if __name__ == "__main__":     main()</pre>
<p><b>Time Complexity</b></p> <ol style="list-style-type: none"> <li><b>Input:</b> Reading three inputs (length, breadth, radius): <math>O(1)</math>.</li> <li><b>Computation:</b> Each formula involves a constant number of operations: <math>O(1)</math>.</li> <li><b>Output:</b> Displaying the results involves constant time: <math>O(1)</math>.</li> </ol> <p><b>Overall Time Complexity: <math>O(1)</math>.</b></p> <p><b>Space Complexity</b></p>		

1. **Variables:** Only a fixed number of variables are used:  $O(1)$ .
2. **No additional data structures are needed.**

**Overall Space Complexity:  $O(1)$ .**

**If the total selling price of 15 items and the total profit earned on them is input, write a c, java, python program to find the cost price of one item**

C	JAVA	PYTHON
<pre>#include &lt;stdio.h&gt;  int main() {     float total_selling_price, total_profit,     total_cost_price, cost_price_per_item;      // Input     printf("Enter the total selling price of 15 items: ");     scanf("%f", &amp;total_selling_price);     printf("Enter the total profit earned: ");     scanf("%f", &amp;total_profit);      // Calculations     total_cost_price = total_selling_price -     total_profit;     cost_price_per_item = total_cost_price / 15;      // Output     printf("Cost Price of one item: %.2f\n",     cost_price_per_item);      return 0; }</pre>	<pre>import java.util.Scanner;  public class CostPriceCalculator {     public static void main(String[] args) {         Scanner scanner = new Scanner(System.in);          // Input         System.out.print("Enter the total selling price of 15 items: ");         double totalSellingPrice =         scanner.nextDouble();         System.out.print("Enter the total profit earned: ");         double totalProfit = scanner.nextDouble();          // Calculations         double totalCostPrice = totalSellingPrice -         totalProfit;         double costPricePerItem = totalCostPrice / 15;          // Output         System.out.printf("Cost Price of one item: %.2f\n", costPricePerItem);          scanner.close();    }}</pre>	<pre>def main():     # Input     total_selling_price = float(input("Enter the total selling price of 15 items: "))     total_profit = float(input("Enter the total profit earned: "))      # Calculations     total_cost_price = total_selling_price -     total_profit     cost_price_per_item = total_cost_price / 15      # Output     print(f"Cost Price of one item: {cost_price_per_item:.2f}")  if __name__ == "__main__":     main()</pre>
<p><b>Time Complexity</b></p> <ol style="list-style-type: none"> <li>1. <b>Input:</b> Reading two inputs ( <math>O(1)</math>).</li> <li>2. <b>Computation:</b> <ul style="list-style-type: none"> <li>o Subtraction for total cost price <math>O(1)</math>.</li> <li>o Division for cost price per item <math>O(1)</math>.</li> </ul> </li> <li>3. <b>Output:</b> Printing the result <math>O(1)</math>.</li> </ol> <p><b>Space Complexity</b></p> <ol style="list-style-type: none"> <li>1. <b>Variables:</b> Only a fixed number of variables are used <math>O(1)</math>.</li> <li>2. <b>No additional data structures are required.</b></li> </ol>		
		<p><b>Overall Time Complexity: <math>O(1)</math>.</b></p> <p><b>Overall Space Complexity: <math>O(1)</math>.</b></p>