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1.

```
class  Clause1_1 {
   public static void main(String[] args) {
      System.out.println("Welcome to OOP Programming");
   }
}

class Clause1_2 {
   public static void main(String[] args) {
      short defaultShort = 42;
      int defaultInt = 12345;
      long defaultLong = 9876543210L;
      float defaultFloat = 3.14f;
      double defaultDouble = 2.71828;
      char defaultChar = 'A';
      String defaultString = "Hello, World!";
      boolean defaultBoolean = true;

      System.out.println("Default values of primitive data types:");
      System.out.println("short: " + defaultShort);
      System.out.println("int: " + defaultInt);
      System.out.println("long: " + defaultLong);
      System.out.println("float: " + defaultFloat);
      System.out.println("double: " + defaultDouble);
      System.out.println("char: " + defaultChar);
      System.out.println("String: " + defaultString);
      System.out.println("boolean: " + defaultBoolean);
   }
}

class Clause1_3 {
   public static void main(String[] args) {
      String str1 = "OOP";
      String str2 = "Object-Oriented Programming";
      if (str1.equals(str2)) {
         System.out.println("str1 is equal to str2");
      } else {
         System.out.println("str1 is not equal to str2");
      }
   }
```

```
}

public class Unit1 {
   public static void main(String[] args) {
      System.out.println("Unit 1: Introduction to Java");
      System.out.println("1 Clause");
      Clause1_1.main(args);
      System.out.println();
```

```
Unit 1: Introduction to Java
1 Clause
Welcome to OOP Programming
```

```
      System.out.println("2 Clause");
      Clause1_2.main(args);
      System.out.println();
```

```
2 Clause
Default values of primitive data types:
short: 42
int: 12345
long: 9876543210
float: 3.14
double: 2.71828
char: A
String: Hello, World!
boolean: true
```

```
      System.out.println("3 Clause");
      Clause1_3.main(args);
      System.out.println();
```

```
3 Clause
str1 is not equal to str2
```

```
   }
}
```

2.

```
import java.util.Scanner;

class Clause2part1 {
   static class Clause2_1 {
      public static void main(String[] args) {
         int x = 5;

         System.out.println("x : " + x);

         x++;
         System.out.println("x++ : " + x);

         ++x;
         System.out.println("++x : " + x);

         x--;
         System.out.println("x-- : " + x);

         --x;
         System.out.println("--x : " + x);
      }
   }

   static class Clause2_2 {
      public static void main(String[] args) {
         int x = 5;
         int y = 3;
         int a = x + y;
         int b = x - y;
         int c = x * y;
         int d = x / y;
         int e = x % y;
         System.out.println("x + y = " + a);
         System.out.println("x - y = " + b);
         System.out.println("x * y = " + c);
         System.out.println("x / y = " + d);
         System.out.println("x % y = " + e);
      }
   }

   static class Clause2_3 {
```

```
        public static void main(String[] args) {
            int x = 100;
            int y = 33;
            System.out.println("x < y : " + (x < y));
            System.out.println("x > y : " + (x > y));
            System.out.println("x <= y : " + (x <= y));
            System.out.println("x >= y : " + (x >= y));
            System.out.println("x == y : " + (x == y));
            System.out.println("x != y : " + (x != y));
        }
    }

    static class Clause2_4 {
        public static void main(String[] args) {
            int a = 10;
            int b = 20;
            boolean condition = true;

            int x = condition ? a : b;

            System.out.println(x);
        }
    }
}

class Clause2part2 {

    static class Clause2_1 {
        public static void main(String[] args) {
            Scanner scanner = new Scanner(System.in);

            System.out.print("Enter the first integer: ");
            int num1 = scanner.nextInt();

            System.out.print("Enter the second integer: ");
            int num2 = scanner.nextInt();

            if (num1 > num2) {
                System.out.println(num1 + " is the greater number.");
                System.out.println(num2 + " is the lesser number.");
            } else if (num2 > num1) {
                System.out.println(num2 + " is the greater number.");
                System.out.println(num1 + " is the lesser number.");
            } else {
```

```
            System.out.println("Both numbers are equal.");
        }
        scanner.close();
    }
}

static class Clause2_2 {
    public static void main(String[] args) {
        char grade = 'A';
        switch (grade) {
            case 'A':
                System.out.println("Excellent!");
                break;
            case 'B':
            case 'C':
                System.out.println("Well done");
                break;
            case 'D':
                System.out.println("You passed");
                break;
            case 'F':
                System.out.println("Better try again");
                break;
            default:
                System.out.println("Invalid grade");
        }
        System.out.println("Your grade is " + grade);
    }
}

static class Clause2_3 {
    public static void main(String[] args) {
        int r = 0;

        for (int i = 1; i <= 10; i++) {
            r += i;
        }

        System.out.println("Total sum of r is: " + r);
    }
}

static class Clause2_4 {
    public static void main(String[] args) {
```

```
        int i = 0;
        while (i <= 5) {
            System.out.println(i + 1);
            i++;
        }
      }
   }

   static class Clause2_5 {
     public static void main(String[] args) {
      int i = 0;

      do {
         System.out.println("Executing loop iteration: " + (i + 1));
         i++;

         if (i > 5) {
            break; // Break the loop if i > 5
         }
      } while (true);
   }
   }
}

class Clause2part3 {
   static class Clause2_1 {
   public static void main(String[] args) {
      int[] a1 = new int[10];
      int[] a2 = {3, 5, 7, 1, 8, 99, 44, -10};
      int[] a3 = {4, 3, 2, 1};

      int lengthA1 = a1.length;
      int lengthA2 = a2.length;
      int lengthA3 = a3.length;

      System.out.println("Length of a1: " + lengthA1);
      System.out.println("Length of a2: " + lengthA2);
      System.out.println("Length of a3: " + lengthA3);
   }
   }
   static class Clause2_2 {
   public static void main(String[] args) {
         int[][] matrix = new int[3][3];
```

```
        int value = 0;
        for (int i = 0; i < 3; i++) {
            for (int j = 0; j < 3; j++) {
                matrix[i][j] = value++;
            }
        }

        // Printing the matrix
        for (int i = 0; i < 3; i++) {
            for (int j = 0; j < 3; j++) {
                System.out.print(matrix[i][j] + " ");
            }
            System.out.println();
        }
    }
  }
}

class Clause2part4 {
    public static void main(String[] args) {
    int[] arr = {234, 6, 846, 85, 96, 198, 545, 12, 60, 34, 4, 87, 7, 1};

    // Perform bubble sort
    int n = arr.length;
    for (int i = 0; i < n - 1; i++) {
        for (int j = 0; j < n - i - 1; j++) {
            if (arr[j] > arr[j + 1]) {
                // Swap arr[j] and arr[j+1]
                int temp = arr[j];
                arr[j] = arr[j + 1];
                arr[j + 1] = temp;
            }
        }
    }

    // Display the sorted array
    System.out.println("Sorted Array in Ascending Order:");
    for (int num : arr) {
        System.out.print(num + " ");
    }
  }
}

class Clause2part5 {
```

```
    static class Clause2_1 {
        public static int[][] performMatrixAddition(int[][] a, int[][] b) {
            int rows = a.length;
            int cols = a[0].length;

            int[][] result = new int[rows][cols];

            for (int i = 0; i < rows; i++) {
                for (int j = 0; j < cols; j++) {
                    result[i][j] = a[i][j] + b[i][j];
                }
            }

            return result;
        }
    }

    static class Clause2_2 {
        public static int[][] performMatrixMultiplication(int[][] a, int[][] b) {
            int rowsA = a.length;
            int colsA = a[0].length;
            int colsB = b[0].length;

            int[][] result = new int[rowsA][colsB];

            for (int i = 0; i < rowsA; i++) {
                for (int j = 0; j < colsB; j++) {
                    result[i][j] = 0;
                    for (int k = 0; k < colsA; k++) {
                        result[i][j] += a[i][k] * b[k][j];
                    }
                }
            }

            return result;
        }
    }
}
```

```
public class Unit2 {
   public static void main(String[] args) {
      System.out.println("Unit 2: Basic Programming");
      System.out.println("Part 1");
      System.out.println("1 Clause");
      Clause2part1.Clause2_1.main(args);
      System.out.println();
```

```
Unit 2: Basic Programming
Part 1
1 Clause
x : 5
x++ : 6
++x : 7
x-- : 6
--x : 5
```

```
      System.out.println("2 Clause");
      Clause2part1.Clause2_2.main(args);
      System.out.println();
```

```
2 Clause
x + y = 8
x - y = 2
x * y = 15
x / y = 1
x % y = 2
```

```
      System.out.println("3 Clause");
      Clause2part1.Clause2_3.main(args);
      System.out.println();
```

```
 3 Clause
 x < y : false
 x > y : true
 x <= y : false
 x >= y : true
 x == y : false
 x != y : true
```

```
System.out.println("4 Clause");
Clause2part1.Clause2_4.main(args);
System.out.println();
```

```
4 Clause
10
```

```
System.out.println("Part 2");
System.out.println("1 Clause");
Clause2part2.Clause2_1.main(args);
System.out.println();
```

```
Part 2
1 Clause
Enter the first integer: 1
Enter the second integer: 2
2 is the greater number.
1 is the lesser number.
```

```
System.out.println("2 Clause");
Clause2part2.Clause2_2.main(args);
System.out.println();
```

```
2 Clause
Excellent!
Your grade is A
```

```
System.out.println("3 Clause");
Clause2part2.Clause2_3.main(args);
System.out.println();
```

```
3 Clause
Total sum of r is: 55
```

```
System.out.println("4 Clause");
Clause2part2.Clause2_4.main(args);
System.out.println();
```

```
4 Clause
1
2
3
4
5
6
```

```
System.out.println("5 Clause");
Clause2part2.Clause2_5.main(args);
System.out.println();
```

```
5 Clause
Executing loop iteration: 1
Executing loop iteration: 2
Executing loop iteration: 3
Executing loop iteration: 4
Executing loop iteration: 5
Executing loop iteration: 6
```

```
System.out.println("Part 3");
System.out.println("1 Clause");
Clause2part3.Clause2_1.main(args);
System.out.println();
```

```
Part 3
1 Clause
Length of a1: 10
Length of a2: 8
Length of a3: 4
```

```
System.out.println("2 Clause");
Clause2part3.Clause2_2.main(args);
System.out.println();
```

```
2 Clause
0 1 2
3 4 5
6 7 8
```

```
System.out.println("Part 4");
Clause2part4.main(args);
System.out.println();
```

```
Part 4
Sorted Array in Ascending Order:
1 4 6 7 12 34 60 85 87 96 198 234 545 846
```

```
System.out.println("Part 5");
    int[][] a1 = {
       {4, 7, 9, 8, 3},
       {2, 4, 7, 8, 1},
       {1, 1, 8, 1, 2},
       {0, 0, 1, 0, 4}
    };

    int[][] b1 = {
       {1, 2, 8, 4, 3},
       {4, 1, 8, 3, 1},
       {2, 1, 0, 0, 5},
       {1, 2, 1, 1, 7}
    };
    int[][] result1 = Clause2part5.Clause2_1.performMatrixAddition(a1, b1);

    System.out.println("Matrix Addition:");
    for (int[] row : result1) {
       for (int col : row) {
          System.out.print(col + " ");
       }
       System.out.println();
    }
```

```
Part 5
Matrix Addition:
5 9 17 12 6
6 5 15 11 2
3 2 8 1 7
1 2 2 1 11
```

```
      System.out.println();
       System.out.println("2 Clause");
       int[][] a2 = {
          {1, 2, 3},
          {4, 5, 6},
          {2, 3, 4}
       };

       int[][] b2 = {
          {1, 2, 3},
          {4, 5, 6},
          {2, 3, 4}
       };

       int[][] result2 = Clause2part5.Clause2_2.performMatrixMultiplication(a2, b2);

       System.out.println("Matrix Multiplication:");
       for (int[] row : result2) {
          for (int col : row) {
             System.out.print(col + " ");
          }
          System.out.println();
       }
```

```
2 Clause
Matrix Multiplication:
15 21 27
36 51 66
22 31 40
```

```
   }
}
```

3.

```
import java.util.Scanner;

class Clause3part2 {
   public static void main(String[] args) {
      Scanner scanner = new Scanner(System.in);

      System.out.print("Enter temperature in Celsius: ");
      double celsius = scanner.nextDouble();

      double fahrenheit = (9.0 / 5.0) * celsius + 32;

      System.out.println("Temperature in Fahrenheit: " + fahrenheit);

      scanner.close();
   }
}

public class Unit3 {
   public static void main(String[] args) {
      System.out.println("Unit 3");
      Clause3part2.main(args);
      System.out.println();
   }
}
```

```
Unit 3
Enter temperature in Celsius: 100
Temperature in Fahrenheit: 212.0
```