

Mata Kuliah : PBO – TI – S1

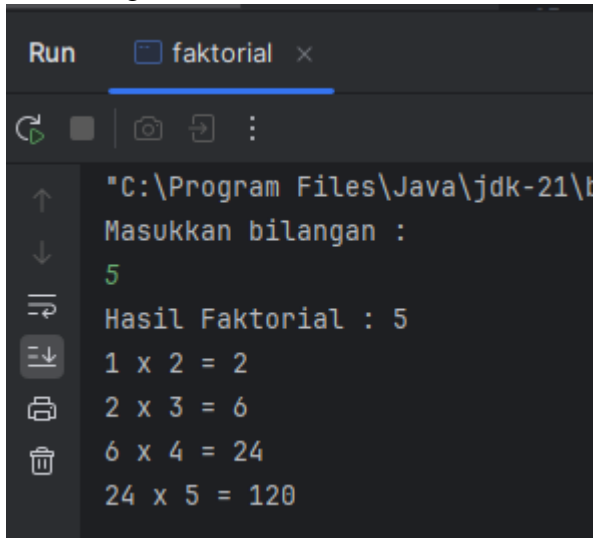
Pertemuan : 6

NIM : A11.2022.14532

Nama : Najma Aura Dias Prameswari

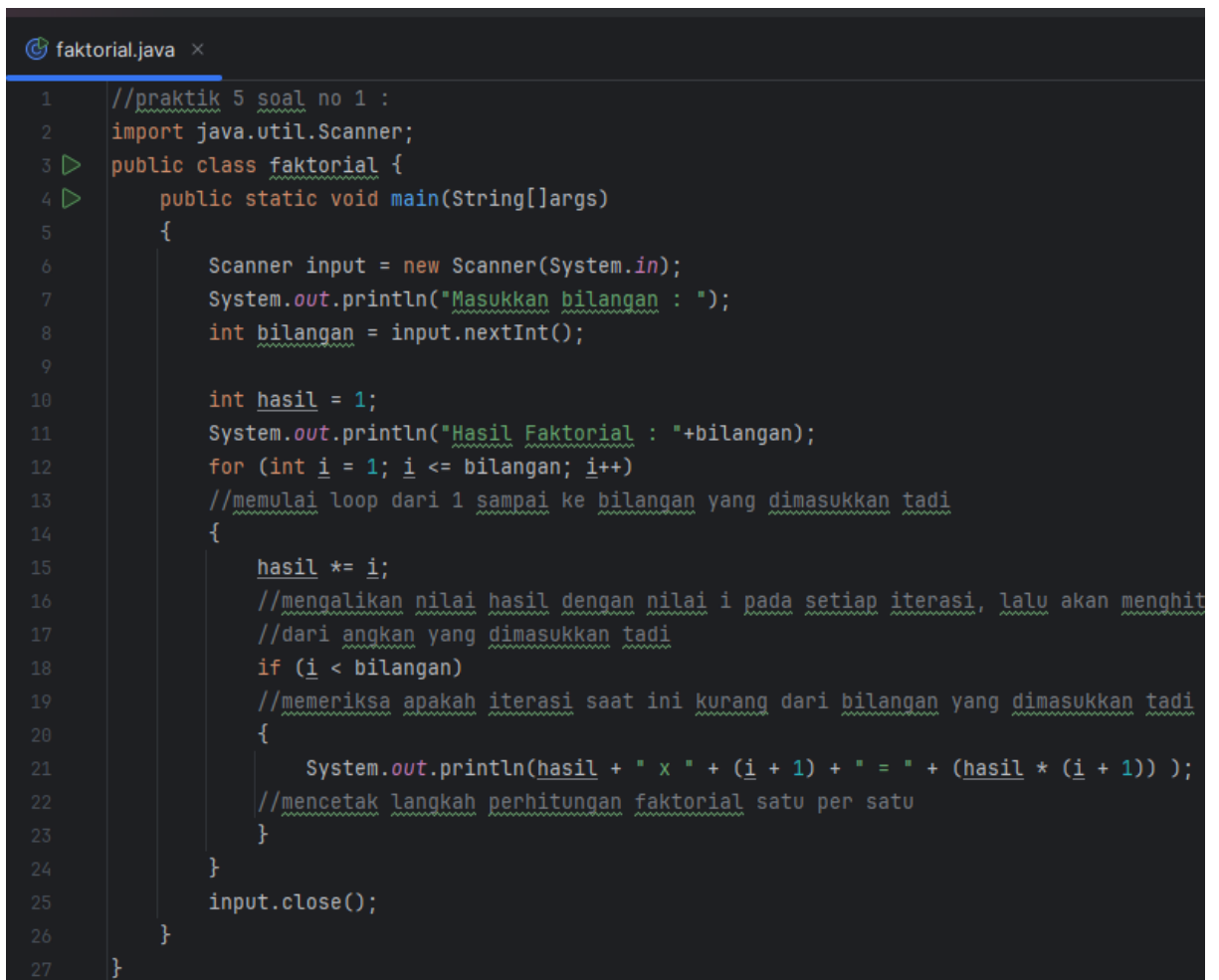
1. Tugas 1 : Menghitung factorial

Hasil Program :



```
Run faktorial x
Masukkan bilangan :
5
Hasil Faktorial : 5
1 x 2 = 2
2 x 3 = 6
6 x 4 = 24
24 x 5 = 120
```

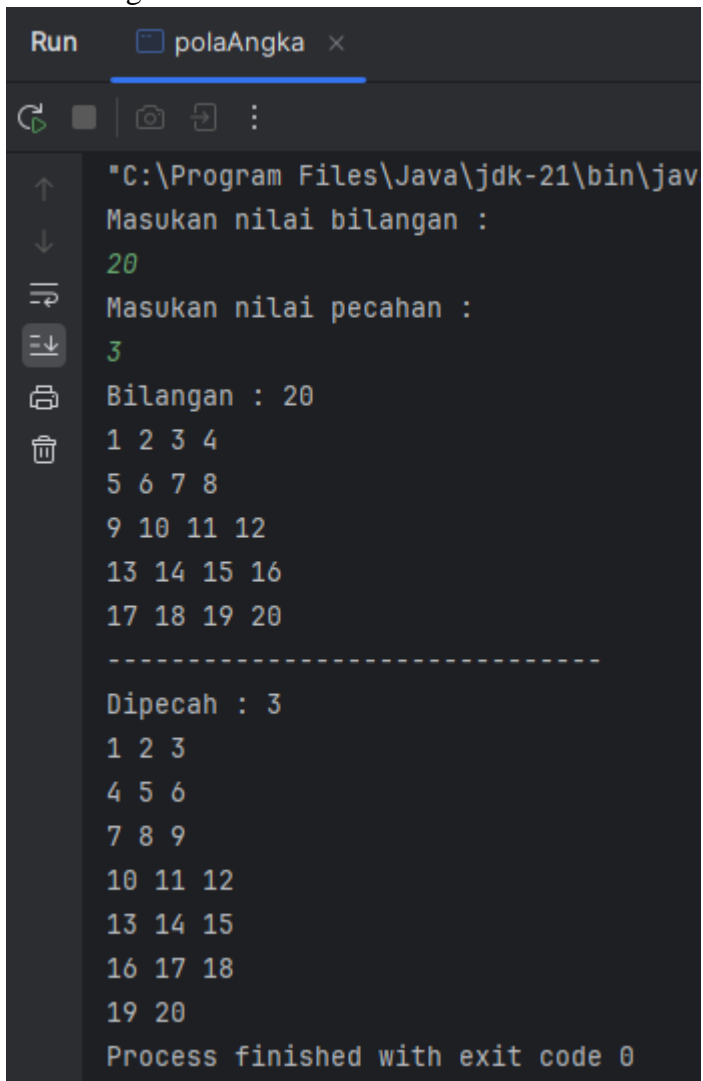
Code Program :



```
faktorial.java x
1 //praktik 5 soal no 1 :
2 import java.util.Scanner;
3 public class faktorial {
4     public static void main(String[] args)
5     {
6         Scanner input = new Scanner(System.in);
7         System.out.println("Masukkan bilangan : ");
8         int bilangan = input.nextInt();
9
10        int hasil = 1;
11        System.out.println("Hasil Faktorial : "+bilangan);
12        for (int i = 1; i <= bilangan; i++)
13            //memulai loop dari 1 sampai ke bilangan yang dimasukkan tadi
14            {
15                hasil *= i;
16                //mengalikan nilai hasil dengan nilai i pada setiap iterasi, lalu akan menghitung
17                //dari angka yang dimasukkan tadi
18                if (i < bilangan)
19                    //memeriksa apakah iterasi saat ini kurang dari bilangan yang dimasukkan tadi
20                    {
21                        System.out.println(hasil + " x " + (i + 1) + " = " + (hasil * (i + 1)));
22                        //mencetak langkah perhitungan faktorial satu per satu
23                    }
24            }
25        input.close();
26    }
27 }
```

2. Tugas 2 : Membuat pola angka

Hasil Program :



```
Run polaAngka x
"C:\Program Files\Java\jdk-21\bin\jav
Masukan nilai bilangan :
20
Masukan nilai pecahan :
3
Bilangan : 20
1 2 3 4
5 6 7 8
9 10 11 12
13 14 15 16
17 18 19 20
-----
Dipecah : 3
1 2 3
4 5 6
7 8 9
10 11 12
13 14 15
16 17 18
19 20
Process finished with exit code 0
```

Code Program :

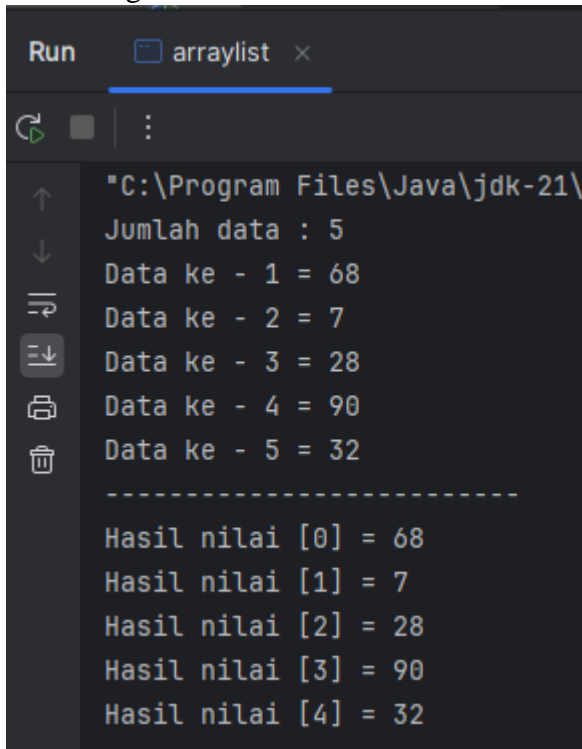
```

2      import java.util.Scanner;
3  ▶   public class polaAngka {
4  ▶       public static void main(String[]args)
5           {
6
7               int angka = 4;
8
9               Scanner input = new Scanner(System.in);
10              System.out.println("Masukan nilai bilangan : ");
11              int bil = input.nextInt();
12              System.out.println("Masukan nilai pecahan : ");
13              int pecahan = input.nextInt();
14              input.close();
15
16              if (pecahan <= bil)
17              {
18                  System.out.println("Bilangan : "+bil);
19                  int counter = 0;
20                  for (int i = 1; i <= bil; i++)
21                  {
22                      System.out.print(i + " ");
23                      counter++;
24                      if (counter == angka)
25                      {
26                          System.out.println();
27                          counter = 0;
28                      }
29                  }
30                  System.out.println("-----");
31                  System.out.println("Dipecah : "+pecahan);
32                  for (int i = 1; i <= bil ; i++)
33                  {
34                      System.out.print(i + " ");
35                      if (i % pecahan == 0)
36                      {
37                          System.out.println();
38                      }
39                  }
40              }
41              else {
42                  System.out.print("Nilai pecahan tidak boleh melebihi nilai bilangan");
43              }
44          }
45      }
46  }

```

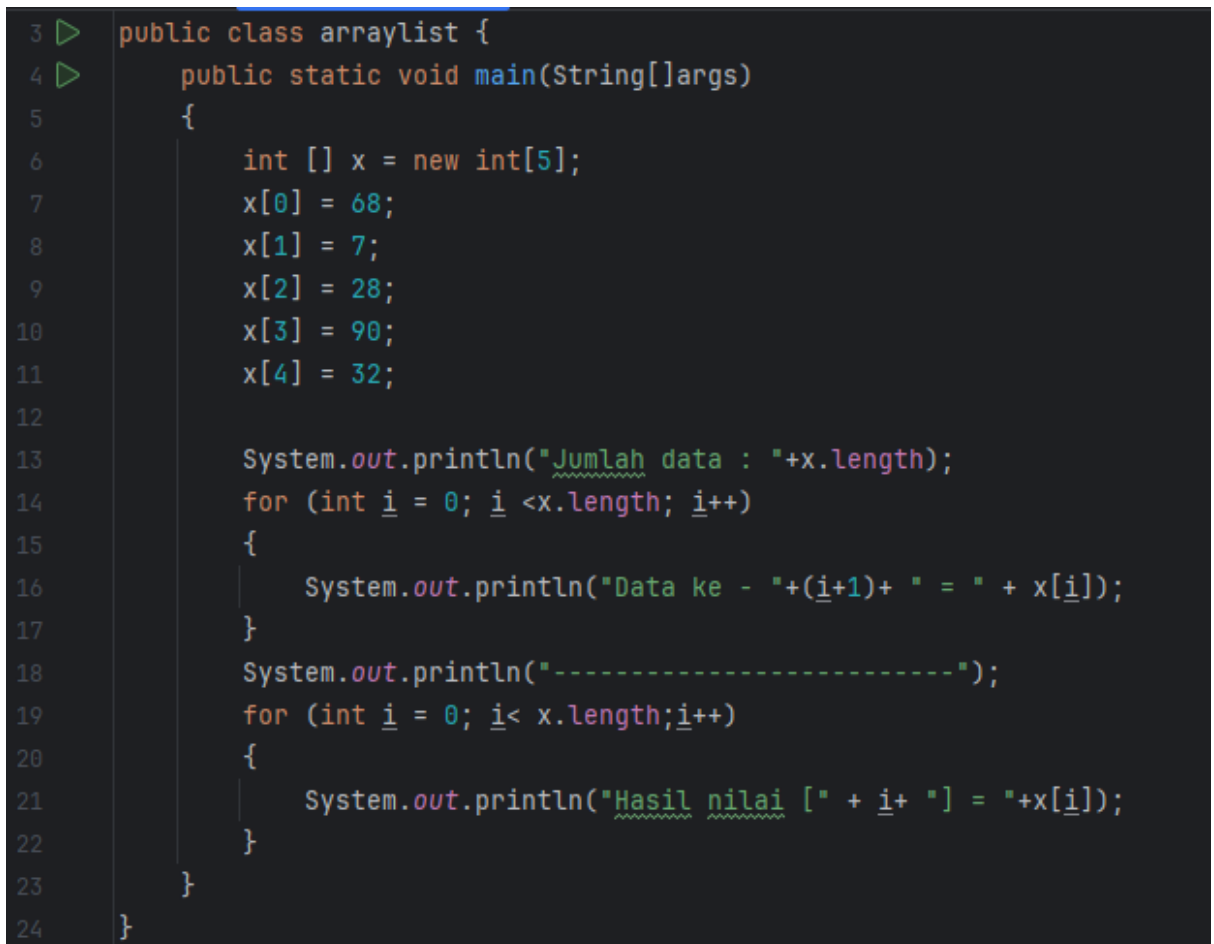
3. Tugas 3 : Single array

Hasil Program :



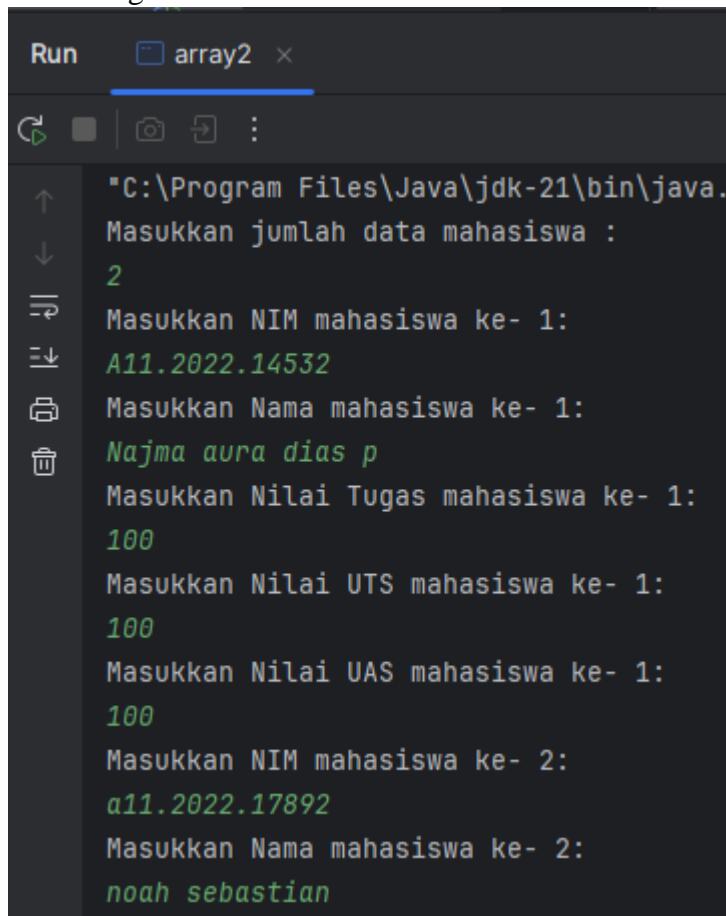
```
Run arraylist x
C:\Program Files\Java\jdk-21\bin\java.exe
Jumlah data : 5
Data ke - 1 = 68
Data ke - 2 = 7
Data ke - 3 = 28
Data ke - 4 = 90
Data ke - 5 = 32
-----
Hasil nilai [0] = 68
Hasil nilai [1] = 7
Hasil nilai [2] = 28
Hasil nilai [3] = 90
Hasil nilai [4] = 32
```

Code Program :

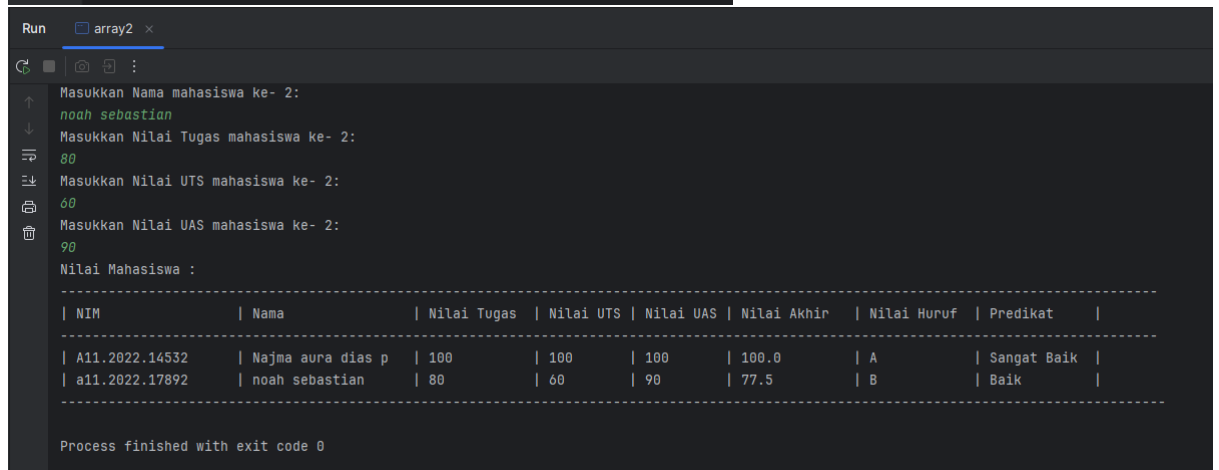


```
3 public class arraylist {
4     public static void main(String[] args)
5     {
6         int [] x = new int[5];
7         x[0] = 68;
8         x[1] = 7;
9         x[2] = 28;
10        x[3] = 90;
11        x[4] = 32;
12
13        System.out.println("Jumlah data : "+x.length);
14        for (int i = 0; i < x.length; i++)
15        {
16            System.out.println("Data ke - " + (i+1) + " = " + x[i]);
17        }
18        System.out.println("-----");
19        for (int i = 0; i < x.length; i++)
20        {
21            System.out.println("Hasil nilai [" + i + "] = " + x[i]);
22        }
23    }
24 }
```

4. Tugas 4 : Menampilkan data daftar nilai
Hasil Program :



```
Run array2 x
"C:\Program Files\Java\jdk-21\bin\java.
Masukkan jumlah data mahasiswa :
2
Masukkan NIM mahasiswa ke- 1:
A11.2022.14532
Masukkan Nama mahasiswa ke- 1:
Najma aura dias p
Masukkan Nilai Tugas mahasiswa ke- 1:
100
Masukkan Nilai UTS mahasiswa ke- 1:
100
Masukkan Nilai UAS mahasiswa ke- 1:
100
Masukkan NIM mahasiswa ke- 2:
a11.2022.17892
Masukkan Nama mahasiswa ke- 2:
noah sebastian
```



```
Run array2 x
Masukkan Nama mahasiswa ke- 2:
noah sebastian
Masukkan Nilai Tugas mahasiswa ke- 2:
80
Masukkan Nilai UTS mahasiswa ke- 2:
60
Masukkan Nilai UAS mahasiswa ke- 2:
90
Nilai Mahasiswa :
-----
| NIM          | Nama          | Nilai Tugas | Nilai UTS | Nilai UAS | Nilai Akhir | Nilai Huruf | Predikat |
|-----|-----|-----|-----|-----|-----|-----|-----|
| A11.2022.14532 | Najma aura dias p | 100         | 100        | 100        | 100.0       | A          | Sangat Baik |
| a11.2022.17892 | noah sebastian   | 80          | 60         | 90         | 77.5       | B          | Baik        |
|-----|-----|-----|-----|-----|-----|-----|-----|

Process finished with exit code 0
```

Code Program :

array2.java ×

```
4 import java.util.Scanner;
5 public class array2 {
6     public static void main(String[]args)
7     {
8         Scanner input = new Scanner(System.in);
9
10        System.out.println("Masukkan jumlah data mahasiswa : ");
11        int jumlahdata = input.nextInt();
12        input.nextLine();
13
14        Mahasiswa[] mahasiswas = new Mahasiswa[jumlahdata];
15        for (int i = 0; i < jumlahdata; i++)
16        {
17            System.out.println("Masukkan NIM mahasiswa ke- " + (i+1) + " : ");
18            String nim = input.nextLine();
19
20            System.out.println("Masukkan Nama mahasiswa ke- " + (i+1) + " : ");
21            String nama = input.nextLine();
22
23            System.out.println("Masukkan Nilai Tugas mahasiswa ke- " + (i+1) + " : ");
24            int nilaitugas = input.nextInt();
25
26            System.out.println("Masukkan Nilai UTS mahasiswa ke- " + (i+1) + " : ");
27            int nilaiuts = input.nextInt();
28
29            System.out.println("Masukkan Nilai UAS mahasiswa ke- " + (i+1) + " : ");
30            int nilaiuas = input.nextInt();
```

array2.java ×

```
5     public class array2 {
6         public static void main(String[]args)
7
8         {
9             input.nextLine();
10            mahasiswas[i] = new Mahasiswa(nim,nama,nilaitugas,nilaiuts,nilaiuas);
11        }
12
13        System.out.println("Nilai Mahasiswa : ");
14        System.out.println("-----");
15        System.out.printf("%-20s| %-20s| %-13s| %-10s| %-10s| %-14s| %-13s| %-13s\n",
16            "NIM", "Nama", "Nilai Tugas", "Nilai UTS", "Nilai UAS", "Nilai Akhir", "Nilai Huruf", "Predikat");
17
18        System.out.println("-----");
19        for (int i = 0; i < jumlahdata; i++)
20        {
21            System.out.printf("%-20s| %-20s| %-13d| %-10d| %-10d| %-14s| %-13s| %-13s\n",
22                mahasiswas[i].getnim(), mahasiswas[i].getnama(), mahasiswas[i].getnilaitugas(),
23                mahasiswas[i].getnilaiuts(), mahasiswas[i].getnilaiuas(), mahasiswas[i].hitungnilaiakhir(),
24                mahasiswas[i].hitungnilaihuruf(), mahasiswas[i].hitungpredikat());
25        }
26        System.out.println("-----");
27    }
28 }
```

array2.java ×

```
54 class Mahasiswa 3 usages
55 {
56     private String nim; 2 usages
57     private String nama; 2 usages
58     private int nilaitugas; 3 usages
59     private int nilaiuts; 3 usages
60     private int nilaiuas; 3 usages
61
62     public Mahasiswa(String nim, String nama, 1 usage
63         int nilaitugas, int nilaiuts, int nilaiuas)
64     {
65         this.nim = nim;
66         this.nama = nama;
67         this.nilaitugas = nilaitugas;
68         this.nilaiuts = nilaiuts;
69         this.nilaiuas = nilaiuas;
70     }
71
72     public String getnim() 1 usage
73     {return nim;}
74
75     public String getnama() 1 usage
76     {return nama;}
77
78     public int getnilaitugas() 1 usage
79     {return nilaitugas;}
```

array2.java ×

```
54 class Mahasiswa 3 usages
81     public int getnilaiuts() 1 usage
82     {return nilaiuts;}
83
84     public int getnilaiuas() 1 usage
85     {return nilaiuas;}
86
87     > public double hitungnilaiakhir() { return (nilaitugas * 0.20) + (nilaiuts * 0.35) + (nilaiuas * 0.45); }
91
92     public String hitungnilaihuruf() 2 usages
93     {
94         double nilai = hitungnilaiakhir();
95         if (nilai >= 85 && nilai <= 100)
96         {
97             return "A";
98         } else if (nilai >= 70 && nilai <= 84) {
99             return "B";
100         } else if (nilai >= 60 && nilai <= 69) {
101             return "C";
102         } else if (nilai >= 40 && nilai <= 59) {
103             return "D";
104         } else {
105             return "E";
106         }
107     }
```

```

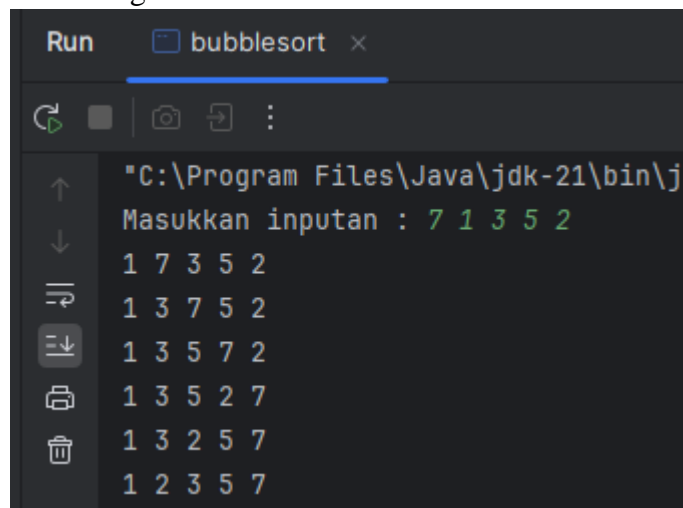
109     public String hitungpredikat() 1 usage
110     {
111         String nilaihuruf = hitungnilaihuruf()
112         switch (nilaihuruf)
113         {
114             case "A":
115                 return "Sangat Baik";
116             case "B":
117                 return "Baik";
118             case "C":
119                 return "Cukup";
120             case "D":
121                 return "Kurang Baik";
122             default:
123                 return "Sangat Kurang Baik";
124         }
125     }
126
127 }

```

5. Tugas 5 : Membuat sorting java

A. Bubble sort

Hasil Program :



```

Run  bubblesort x
Masukkan inputan : 7 1 3 5 2
1 7 3 5 2
1 3 7 5 2
1 3 5 7 2
1 3 5 2 7
1 3 2 5 7
1 2 3 5 7

```

Code Program :

bubblesort.java ×

```
2 import java.util.Scanner;
3
4 public class bubblesort {
5     public static void main(String[] args)
6     {
7         Scanner scanner = new Scanner(System.in);
8
9         System.out.print("Masukkan inputan : ");
10        String input = scanner.nextLine();
11        //memisahkan string input menjadi array string me
12        String[] numbersStr = input.split(regex: " ");
13
14        //membuat array integer/int untuk menyimpan angka
15        int[] numbers = new int[numbersStr.length];
16
17        //loop melalui array string input
18        for (int i = 0; i < numbersStr.length; i++)
19        {
20            //mengonversi setiap string menjadi int/integ
21            numbers[i] = Integer.parseInt(numbersStr[i]);
22        }
23        //kata - kata bubble sort harus beda dengan nama
24        // metode ini untuk memanggil array numbers sebag
25        bubbleSort(numbers);
26    }
```

```
4      public class bubblesort {
30          static void bubbleSort(int[] arr) 1 usage
31      {
32          //n = mendapatkan panjang array
33          int n = arr.length;
34
35          //untuk menandai apakah ada pertukaran p
36          boolean swapped;
37
38          //loop melalui array
39          for (int i = 0; i < n - 1; i++)
40          {
41              //swapped ke false/salah diawal seti
42              swapped = false;
43
44              //loop melalui array, membatasi bag
45              for (int j = 0; j < n - i - 1; j++)
46              {
47                  //memeriksa apakah elemen saat i
48                  if (arr[j] > arr[j + 1])
49                  {
50                      //menyimpan nilai sementara
51                      int temp = arr[j];
52
53                      //menyalin nilai elemen ber
54                      arr[j] = arr[j + 1];
```

```

bubblesort.java x
4      public class bubblesort {
30          static void bubbleSort(int[] arr) {
57              arr[j + 1] = temp;
58
59              //memanggil metode
60              printArray(arr);
61
62              //menandai bahwa ad
63              swapped = true;
64          }
65      }
66      //memeriksa apakah ada pert
67      //jika tidak, array sudah t
68      if (!swapped)
69      {
70          break;
71      }
72  }
73  }

76  @ static void printArray(int[] arr) {
77      {
78          //loop melalui arrat
79          for (int num : arr)
80          {
81              //mencetak setiap elemen
82              System.out.print(num + " ");
83          }
84          //mencetak baris baru setelah men
85          System.out.println();
86      }
87  }

```

B. Quick sort

Hasil Program :

```

Run quicksort x
C:\Program Files\Java
Array sebelumnya :
7 1 3 5 2
Array terurut :
1 2 3 5 7

```

Code Program :

```
3 ▶ public class quicksort {
4 ▶   public static void main(String[] args)
5   {
6       int arr[] = {7,1,3,5,2};
7       System.out.println("Array sebelumnya : ");
8       printArray(arr);
9       quickSort(arr, low: 0, high: arr.length-1);
10      System.out.println("Array terurut : ");
11      printArray(arr);
12  }
13
14  public static void quickSort(int[] arr, int low, int high)
15  {
16      if (low < high)
17      {
18          int pi = partition(arr, low, high);
19          quickSort(arr, low, high: pi - 1);
20          quickSort(arr, low: pi + 1, high);
21      }
22  }
23
24 @ public static int partition(int[] arr, int low, int high) 1
25  {
26      int pivot = arr[high];
27      int i = (low - 1);
28
29      //loop melalui sub array
30      for (int j = low; j < high; j++)
31      {
32          if (arr[j] < pivot)
33          {
34              i++;
35              int temp = arr[i];
36              arr[i] = arr[j];
37              arr[j] = temp;
38          }
39      }
40
41      int temp = arr[i + 1];
42      arr[i + 1] = arr[high];
43      arr[high] = temp;
44      return i + 1;
45  }
```

```

47 @      public static void printArray(int[] arr) {
48          {
49              //loop melalui array
50              for (int i = 0; i < arr.length; i++)
51              {
52                  System.out.print(arr[i] + " ");
53              }
54              System.out.println();
55          }
56          |
57      }

```

C. Insertion sort

Hasil Program :

```

Run  insertionsort x
Masukkan inputan : 7 1 3 5 2
1 7 3 5 2
1 3 7 5 2
1 3 5 7 2
1 2 3 5 7

```

Code Program :

```

3  import java.util.Scanner;
4  ▶ public class insertionsort {
5  ▶     public static void main(String[] args) {
6      Scanner scanner = new Scanner(System.in);
7
8      System.out.print("Masukkan inputan : ");
9      String input = scanner.nextLine();
10
11     //memisahkan string input menjadi array string menjadi
12     String[] numbersStr = input.split(regex: " ");
13
14     //membuat array integer/int untuk menyimpan angka dari
15     int[] numbers = new int[numbersStr.length];
16
17     //loop melalui array string input
18     for (int i = 0; i < numbersStr.length; i++) {
19         //mengonversi setiap string menjadi int/integer
20         numbers[i] = Integer.parseInt(numbersStr[i]);
21     }
22     //kata - kata insertion sort harus beda dengan nama
23     // metode ini untuk memanggil array sebagai argumen
24     insertionSort(numbers);
25 }

```

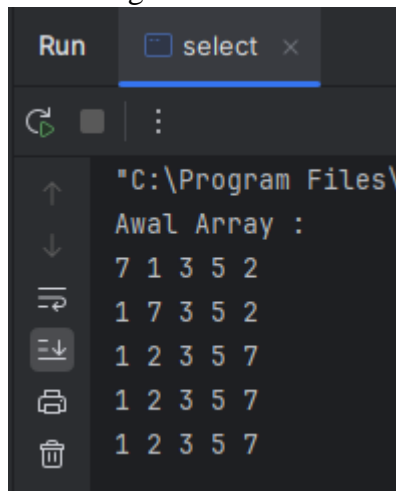
```

4 public class insertionsort {
5
6     @ static void insertionSort(int[] arr) {
7         {
8             //n untuk panjang array
9             int n = arr.length;
10
11             //loop melalui array dimulai dari index 1
12             for (int i = 1; i < n; ++i) {
13                 //menyimpan nilai elemen saat ini ke variabel key
14                 int key = arr[i];
15
16                 //mendeklarasikan variabel j untuk menyimpan index sebelumnya
17                 int j = i - 1;
18
19                 //memeriksa elemen sebelumnya & melakukan penempatan yang benar untuk elemen saat ini
20                 while (j >= 0 && arr[j] > key) {
21                     //memindahkan elemen yang lebih besar ke belakang
22                     arr[j + 1] = arr[j];
23
24                     //memindahkan ke elemen sebelumnya
25                     j = j - 1;
26                 }
27                 //menempatkan elemen saat ini ke tempat yang benar
28                 arr[j + 1] = key;
29
30                 //mencetak array setelah setiap iterasi
31                 printArray(arr);
32             }
33         }
34
35         //mendefinisikan metode printArray untuk mencetak array
36         @ static void printArray(int[] arr) {
37             {
38                 //loop melalui array
39                 for (int num : arr) {
40                     //mencetak setiap elemen
41                     System.out.print(num + " ");
42                 }
43                 //mencetak baris baru setelah selesai mencetak array
44                 System.out.println();
45             }
46         }
47     }
48 }

```

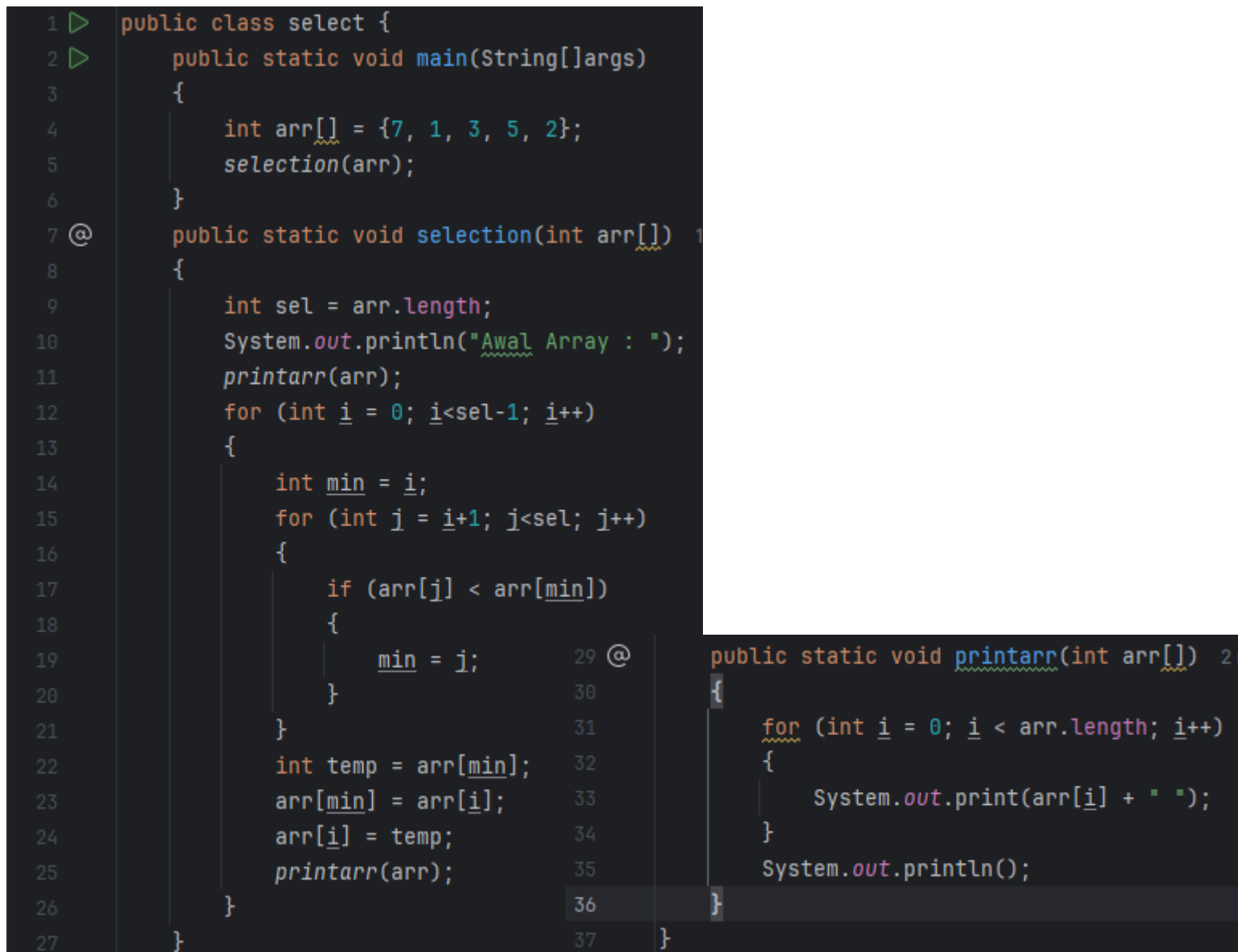
D. Selection sort

Hasil Program :



```
Run select x
C:\Program Files\
Awal Array :
7 1 3 5 2
1 7 3 5 2
1 2 3 5 7
1 2 3 5 7
1 2 3 5 7
```

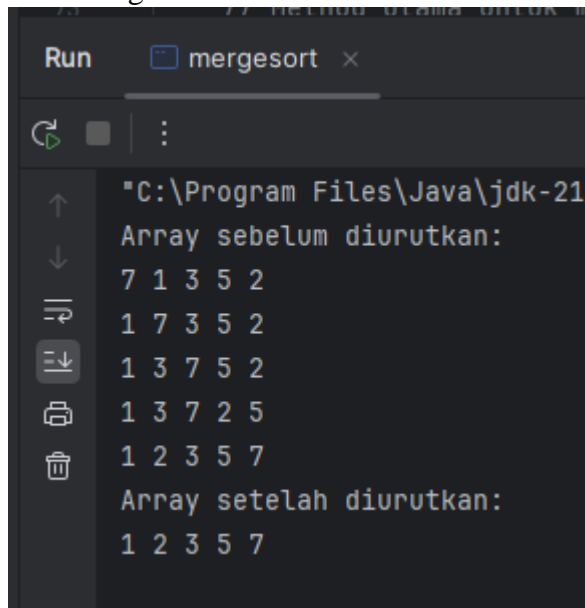
Code Program :



```
1 public class select {
2     public static void main(String[] args)
3     {
4         int arr[] = {7, 1, 3, 5, 2};
5         selection(arr);
6     }
7     public static void selection(int arr[])
8     {
9         int sel = arr.length;
10        System.out.println("Awal Array : ");
11        printarr(arr);
12        for (int i = 0; i < sel-1; i++)
13        {
14            int min = i;
15            for (int j = i+1; j < sel; j++)
16            {
17                if (arr[j] < arr[min])
18                {
19                    min = j;
20                }
21            }
22            int temp = arr[min];
23            arr[min] = arr[i];
24            arr[i] = temp;
25            printarr(arr);
26        }
27    }
29 @ public static void printarr(int arr[])
30 {
31     for (int i = 0; i < arr.length; i++)
32     {
33         System.out.print(arr[i] + " ");
34     }
35     System.out.println();
36 }
37 }
```

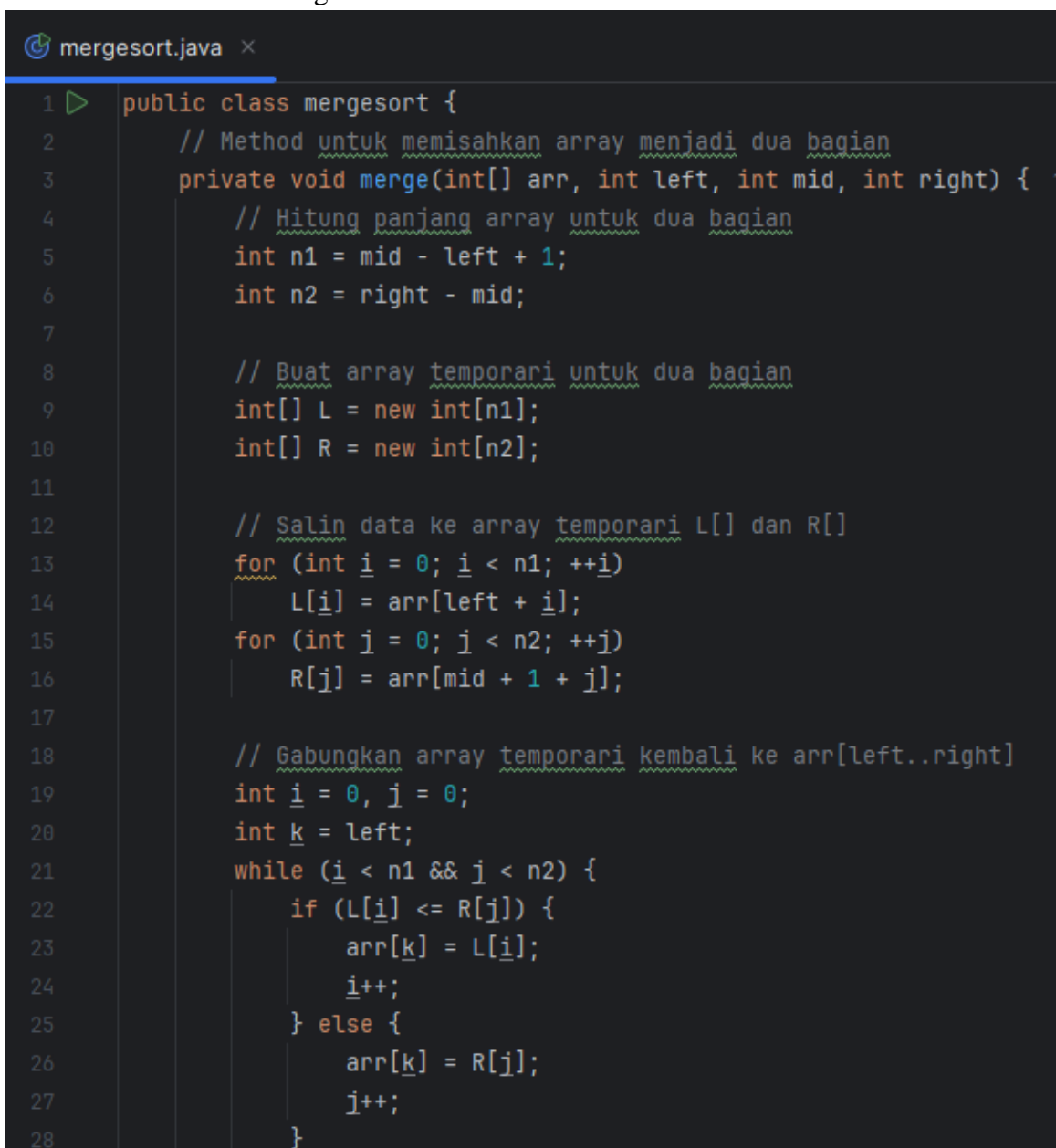

E. Merge sort

Hasil Program :



```
Run mergesort x
Array sebelum diurutkan:
7 1 3 5 2
1 7 3 5 2
1 3 7 5 2
1 3 7 2 5
1 2 3 5 7
Array setelah diurutkan:
1 2 3 5 7
```

Code Program :



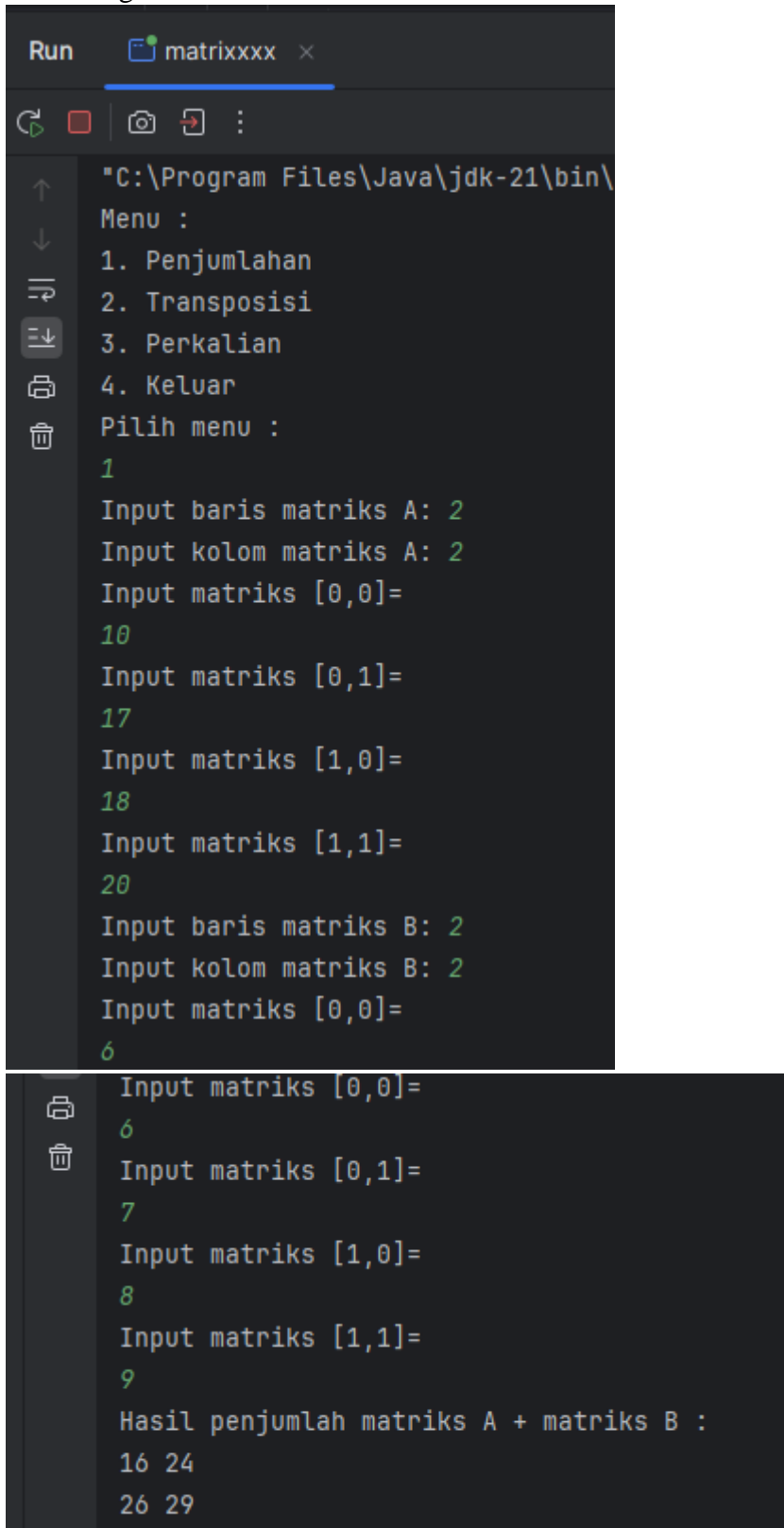
```
mergesort.java x
1 public class mergesort {
2     // Method untuk memisahkan array menjadi dua bagian
3     private void merge(int[] arr, int left, int mid, int right) {
4         // Hitung panjang array untuk dua bagian
5         int n1 = mid - left + 1;
6         int n2 = right - mid;
7
8         // Buat array temporari untuk dua bagian
9         int[] L = new int[n1];
10        int[] R = new int[n2];
11
12        // Salin data ke array temporari L[] dan R[]
13        for (int i = 0; i < n1; ++i)
14            L[i] = arr[left + i];
15        for (int j = 0; j < n2; ++j)
16            R[j] = arr[mid + 1 + j];
17
18        // Gabungkan array temporari kembali ke arr[left..right]
19        int i = 0, j = 0;
20        int k = left;
21        while (i < n1 && j < n2) {
22            if (L[i] <= R[j]) {
23                arr[k] = L[i];
24                i++;
25            } else {
26                arr[k] = R[j];
27                j++;
28            }
29        }
30    }
31 }
```

```

28         }
29         k++;
30     }
31
32     // Salin sisa elemen di L[] jika ada
33     while (i < n1) {
34         arr[k] = L[i];
35         i++;
36         k++;
37     }
38
39     // Salin sisa elemen di R[] jika ada
40     while (j < n2) {
41         arr[k] = R[j];
42         j++;
43         k++;
44     }
45     printArray(arr);
46 }
47
48 // Method utama untuk melakukan merge sort
49 private void sort(int[] arr, int left, int right) {
50     if (left < right) {
51         // Temukan titik tengah
52         int mid = (left + right) / 2;
53
54         // Panggil sort() untuk bagian kiri array
55         sort(arr, left, mid);
56
57         // Panggil sort() untuk bagian kanan array
58         sort(arr, mid + 1, right);
59
60         // Gabungkan dua bagian yang sudah diurutkan
61         merge(arr, left, mid, right);
62     }
63 }
64
65
66 // Method untuk mencetak array
67 private void printArray(int[] arr) { 3 usages
68     for (int i = 0; i < arr.length; ++i)
69         System.out.print(arr[i] + " ");
70     System.out.println();
71 }

```

6. Tugas 6 : Menghitung penjumlahan dan perkalian matriks
Hasil Program :



```
Run matrixxxx x
Menu :
1. Penjumlahan
2. Transposisi
3. Perkalian
4. Keluar
Pilih menu :
1
Input baris matriks A: 2
Input kolom matriks A: 2
Input matriks [0,0]=
10
Input matriks [0,1]=
17
Input matriks [1,0]=
18
Input matriks [1,1]=
20
Input baris matriks B: 2
Input kolom matriks B: 2
Input matriks [0,0]=
6
Input matriks [0,1]=
7
Input matriks [1,0]=
8
Input matriks [1,1]=
9
Hasil penjumlahan matriks A + matriks B :
16 24
26 29
```

Gfds

Code Program :

matrix.java matrixxxx.java × latihan4.java

```
1  import java.util.Scanner;
2  ▶ public class matrixxxx {
3  ▶  ◯ public static void main(String[] args) {
4      Scanner scanner = new Scanner(System.in);
5
6      ◯ while (true) {
7          System.out.println("Menu : ");
8          System.out.println("1. Penjumlahan ");
9          System.out.println("2. Transposisi ");
10         System.out.println("3. Perkalian ");
11         System.out.println("4. Keluar ");
12         System.out.println("Pilih menu : ");
13         int menu = scanner.nextInt();
14
15         ◯ switch (menu) {
16             case 1:
17                 jumlahan(scanner); // penjumlahan
18                 break;
19
20             case 2:
21                 trans(scanner); // transposisi
22                 break;
23
24             case 3:
25                 kali(scanner); // perkalian
26                 break;
```

```

28         case 4:
29             System.out.println("Terima kasih");
30             return;//klo pilih keluar
31         default:
32             System.out.println("Pilihan menu tidak ada");
33     }
34 }
35 }//kurung main
36
37 //method input data matriks
38 @ public static int[][] inputdata(int rows, int cols, Scanner scanner) {
39     int[][] matrikss = new int[rows][cols];
40     for (int i = 0; i < rows; i++) {
41         for (int j = 0; j < cols; j++) {
42             System.out.println("Input matriks [" + i + ", " + j + "] = ");
43             matrikss[i][j] = scanner.nextInt();
44         }
45     }
46     return matrikss;
47 }

```

```

50 @ public static void resultmatriks(int[][] matriks) {
51     for (int[] row : matriks) {
52         for (int num : row) {
53             System.out.print(num + " ");
54         }
55         System.out.println();
56     }
57 }

```

```

59 //perhitungan penjumlahan
60 @ public static void jumlahan(Scanner scanner) { 1 usage
61     System.out.print("Input baris matriks A: ");
62     int barisA = scanner.nextInt();
63     System.out.print("Input kolom matriks A: ");
64     int kolomA = scanner.nextInt();
65     int[][] matriksA = inputdata(barisA, kolomA, scanner);
66
67     System.out.print("Input baris matriks B: ");
68     int barisB = scanner.nextInt();
69     System.out.print("Input kolom matriks B: ");
70     int kolomB = scanner.nextInt();
71     int[][] matriksB = inputdata(barisB, kolomB, scanner);
72
73     if (barisA != barisB || kolomA != kolomB) {
74         System.out.println("Matriks tidak dapat dijumlahkan. Karena ukurannya tidak sama.");
75     } else {
76         int[][] sum = addmatriks(matriksA, matriksB);
77         System.out.println("Hasil penjumlahan matriks A + matriks B : ");
78         resultmatriks(sum);
79     }
80 }

```

```

82 @    public static int[][] addmatriks(int[][] matriksA, int[][] matriksB) {
83        int rows = matriksA.length;
84        int cols = matriksB.length;
85        int[][] hasil = new int[rows][cols];
86        for (int i = 0; i < rows; i++) {
87            for (int j = 0; j < cols; j++) {
88                hasil[i][j] = matriksA[i][j] + matriksB[i][j];
89            }
90        }
91        return hasil;
92    }
93
94    //method transposisi
95 @    public static void trans(Scanner scanner) { 1 usage
96        System.out.print("Input baris matriks C: ");
97        int barisC = scanner.nextInt();
98        System.out.print("Input kolom matriks C: ");
99        int kolomC = scanner.nextInt();
100        int[][] matriksC = inputdata(barisC, kolomC, scanner);
101
102        int[][] transpoA = addtrans(matriksC);
103        System.out.println("Hasil transposisi matriks C : ");
104        resultmatriks(transpoA);
105    }
106
107 @    public static int[][] addtrans(int[][] matriksC) { 1
108        int rows = matriksC.length;
109        int cols = matriksC[0].length;
110        int[][] hasil2 = new int[cols][rows];
111        for (int i = 0; i < cols; i++) {
112            for (int j = 0; j < rows; j++) {
113                hasil2[i][j] = matriksC[j][i]; //ditukar
114            }
115        }
116        return hasil2;
117    }

```

```

120 @ public static void kali(Scanner scanner) { 1 usage
121     System.out.print("Input baris matriks A: ");
122     int barisD = scanner.nextInt();
123     System.out.print("Input kolom matriks A: ");
124     int kolomD = scanner.nextInt();
125     int[][] matriksD = inputdata(barisD, kolomD, scanner);
126
127     System.out.print("Input baris matriks B: ");
128     int barisE = scanner.nextInt();
129     System.out.print("Input kolom matriks B: ");
130     int kolomE = scanner.nextInt();
131     int[][] matriksE = inputdata(barisE, kolomE, scanner);
132
133     if (kolomD != barisE) {
134         System.out.println("Perkalian matriks tidak dapat terjadi, karena jumlah kolom matriks A " +
135             "tidak sama dengan jumlah baris matriks B");
136     } else {
137         int[][] kalic = addkali(matriksD, matriksE);
138         System.out.println("Hasil perkalian matriks A x matriks B : ");
139         resultmatriks(kalic);
140     }
141 }

```

```

143 @ public static int[][] addkali(int[][] matriksD, int[][] matriksE) {
144     int rowA = matriksD.length;
145     int colsA = matriksD[0].length;
146     int colB = matriksE[0].length;
147     int[][] hasil3 = new int[rowA][colB];
148     for (int i = 0; i < rowA; i++) {
149         for (int j = 0; j < colB; j++) {
150             for (int k = 0; k < colsA; k++) {
151                 hasil3[i][j] += matriksD[i][k] * matriksE[k][j];
152             }
153         }
154     }
155     return hasil3;
156 }
157
158 } //kurung class

```

7. Tugas 7 : Membuat array list demo

Hasil Program :

```
Run  matrixdemo x
Masukan jumlah data matriks :
2
Masukan nilai matriks A :
Masukkan nilai ke- 1:
10
Masukkan nilai ke- 2:
20
Masukan nilai matriks B :
Masukkan nilai ke- 1:
5
Masukkan nilai ke- 2:
7
Hasil penjumlahan matriks A + matriks B : [15, 27]
Hasil pengurangan matriks A - matriks B : [5, 13]
Hasil perkalian matriks A x matriks B : [50, 140]
Hasil pembagian matriks A : matriks B : [15.0, 27.0]
```

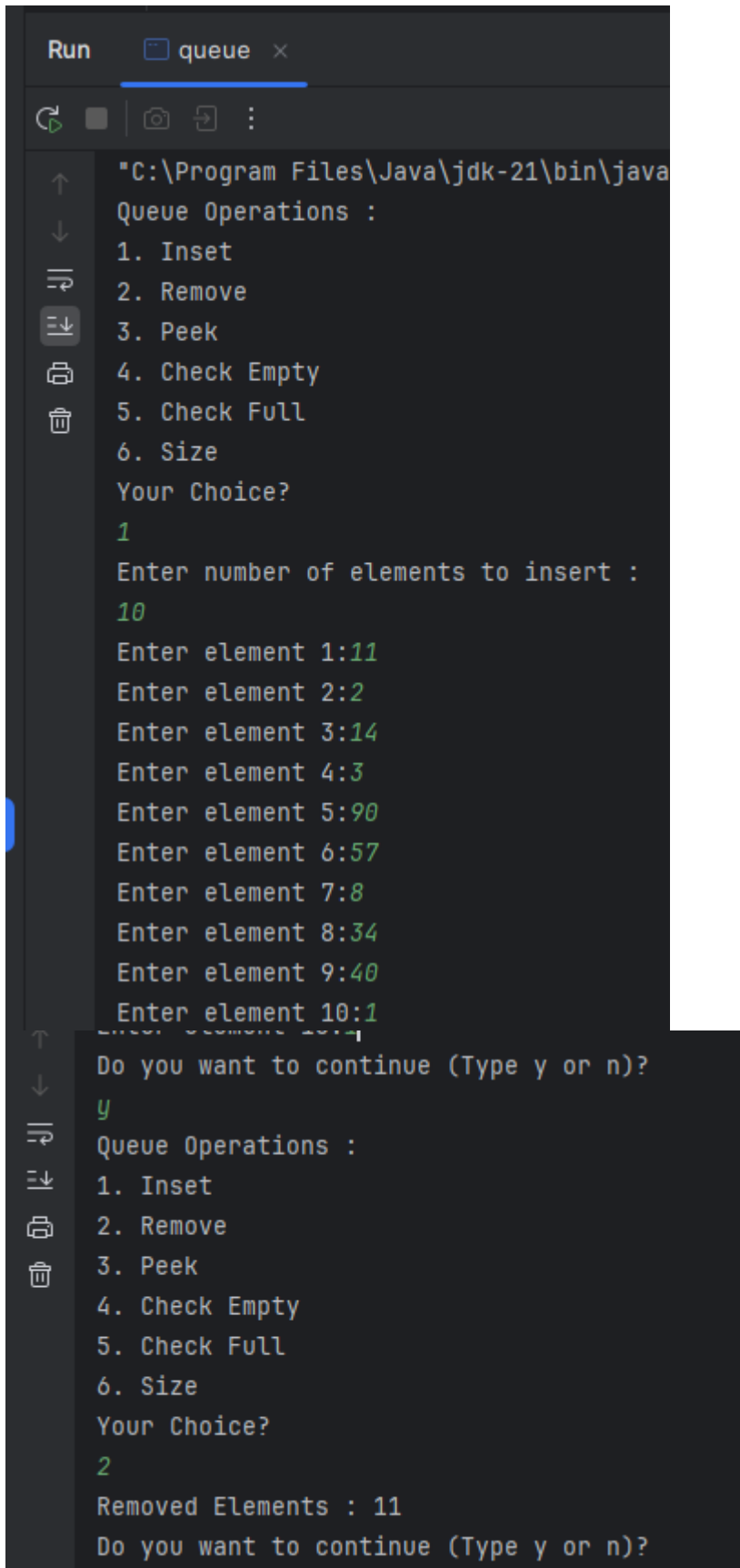
Code Program :

```
matrixdemo.java x
1  import java.util.ArrayList;
2  import java.util.Scanner;
3  public class matrixdemo {
4      public static void main(String[] args)
5      {
6          ArrayList<Integer> matriksA = new ArrayList<Integer>();
7          ArrayList<Integer> matriksB = new ArrayList<Integer>();
8          ArrayList<Integer> tambah = new ArrayList<Integer>();
9          ArrayList<Integer> kurang = new ArrayList<Integer>();
10         ArrayList<Integer> kali = new ArrayList<Integer>();
11         ArrayList<Double> bagi = new ArrayList<Double>();
12
13         Scanner scanner = new Scanner(System.in);
14         //memasukkan jumlah data
15         System.out.println("Masukan jumlah data matriks : ");
16         int jumlah = scanner.nextInt();
17
18         //memasukkan data matriks A
19         System.out.println("Masukan nilai matriks A : ");
20         for (int i = 0; i < jumlah; i++)
21         {
22             System.out.println("Masukkan nilai ke- " + (i + 1) + ": ");
23             int nilai = scanner.nextInt();
24             matriksA.add(nilai);
25         }
```



```
3     public class matrixdemo {
4         public static void main(String[] args)
26             //memasukkan data matriks B
27             System.out.println("Masukan nilai matriks B : ");
28             for (int i = 0; i < jumlah; i++)
29             {
30                 System.out.println("Masukkan nilai ke- " + (i + 1) + ": ");
31                 int nilai = scanner.nextInt();
32                 matriksB.add(nilai);
33             }
34
35             //penjumlahan :
36             for (int i = 0; i < jumlah; i++)
37             {
38                 tambah.add(matriksA.get(i) + matriksB.get(i));
39             }
40             //pengurangan:
41             for (int i = 0; i < jumlah; i++)
42             {
43                 kurang.add(matriksA.get(i) - matriksB.get(i));
44             }
45             //perkalian :
46             for (int i = 0; i < jumlah; i++)
47             {
48                 kali.add(matriksA.get(i) * matriksB.get(i));
49             }
50             //pembagian :
51             for (int i = 0; i < jumlah; i++)
52             {
53                 bagi.add((double)matriksA.get(i) + matriksB.get(i));
54             }
55
56             //method cetak :
57             System.out.println("Hasil penjumlahan matriks A + matriks B : "+tambah);
58             System.out.println("Hasil pengurangan matriks A - matriks B : "+kurang);
59             System.out.println("Hasil perkalian matriks A x matriks B : "+kali);
60             System.out.println("Hasil pembagian matriks A : matriks B : "+bagi);
61
62             scanner.close();
63         }
64     }
```

8. Tugas 8 : Membuat program implementasi queue/antrian
Hasil Program :



```
Run queue x
Queue Operations :
1. Inset
2. Remove
3. Peek
4. Check Empty
5. Check Full
6. Size
Your Choice?
1
Enter number of elements to insert :
10
Enter element 1:11
Enter element 2:2
Enter element 3:14
Enter element 4:3
Enter element 5:90
Enter element 6:57
Enter element 7:8
Enter element 8:34
Enter element 9:40
Enter element 10:1
Do you want to continue (Type y or n)?
y
Queue Operations :
1. Inset
2. Remove
3. Peek
4. Check Empty
5. Check Full
6. Size
Your Choice?
2
Removed Elements : 11
Do you want to continue (Type y or n)?
```

```

↑ Do you want to continue (Type y or n)? |
↓ y
⇌ Queue Operations :
⇌ 1. Inset
⇌ 2. Remove
⇌ 3. Peek
⇌ 4. Check Empty
⇌ 5. Check Full
⇌ 6. Size
Your Choice?
3
Peeked Elements : 2
Do you want to continue (Type y or n)?
y
Queue Operations :
1. Inset
2. Remove
3. Peek
4. Check Empty
5. Check Full
6. Size
Your Choice?
4

```

```

↑ Your Choice? |
↓ 4
⇌ Queue is not empty
⇌ Do you want to continue (Type y or n)?
⇌ y
⇌ Queue Operations :
⇌ 1. Inset
⇌ 2. Remove
⇌ 3. Peek
⇌ 4. Check Empty
⇌ 5. Check Full
⇌ 6. Size
Your Choice?
5
Queue cannot become full
Do you want to continue (Type y or n)?
y

```

```

Queue Operations : |
1. Inset
2. Remove
3. Peek
4. Check Empty
5. Check Full
6. Size
Your Choice?
6
Size = 9
Queue = [2, 14, 3, 90, 57, 8, 34, 40, 1]
Do you want to continue (Type y or n)?
n

```

Code Program :

```

1 import java.util.Scanner;
2 import java.util.Queue;
3 import java.util.LinkedList;
4
5 public class queue {
6     public static void main(String[] args)
7     {
8         Scanner scanner = new Scanner(System.in);
9         Queue<Integer> antrian = new LinkedList<>();
10
11         char pilih;
12         do {
13             System.out.println("Queue Operations : ");
14             System.out.println("1. Inset");
15             System.out.println("2. Remove");
16             System.out.println("3. Peek");
17             System.out.println("4. Check Empty");
18             System.out.println("5. Check Full");
19             System.out.println("6. Size");
20             System.out.println("Your Choice? ");
21             int seleksi = scanner.nextInt();
22             switch (seleksi)
23             {
24                 case 1:
25                     System.out.println("Enter number of elements to insert : ");
26                     int numelements = scanner.nextInt();
27                     for (int i = 0; i < numelements; i++)
28                     {
29                         System.out.print("Enter element " + (i + 1) + ":");
30                         int element = scanner.nextInt();
31                         antrian.offer(element);
32                     }
33                     break;
34
35                 case 2:
36                     if (!antrian.isEmpty())
37                     {
38                         int removeelements = antrian.poll();
39                         System.out.println("Removed Elements : "+removeelements);
40                     } else {
41                         System.out.println("Queue is empty.");
42                     }
43                     break;

```

```

45         case 3:|
46             if (!antrian.isEmpty())
47             {
48                 int peekelement = antrian.peek();
49                 System.out.println("Peeked Elements : "+peekelement)
50             }else {
51                 System.out.println("Queue is empety");
52             }
53             break;
54         case 4:
55             if (antrian.isEmpty())
56             {
57                 System.out.println("Queue is empety");
58             }else {
59                 System.out.println("Queue is not empety");
60             }
61             break;
62         case 5:
63             System.out.println("Queue cannot become full");
64             break;
65         case 6:
66             System.out.println("Size = " + antrian.size());
67             System.out.println("Queue = " + antrian);
68             break;
69         default:
70             System.out.println("Invalid Option");
71     }
72     System.out.println("Do you want to continue (Type y or n)? ");
73     pilih = scanner.next().charAt(0);
74     }while (pilih == 'y' || pilih == 'Y');
75     scanner.close();
76 }
77 }

```