Nama : Sofiyah Hanifa
Nim : 233210010
Prodi : Sistem Informasi Akuntansi

A. PRAKTIK

1. Deklarasi dan inisialisasi array 2-dimensi. Bandingkan dengan array 1-dimensi dan jelaskan dalam program.

```
1. public class Array2 {
2. public static void main(String[] args) {
3. String cats[][]= {{"terry","brown"},
4. {"kitty","white"},
5. {"toby","gray"},
6. {"fido","black"}};
7. System.out.println("Nama Kucing\tWarna");
   System.out.println(cats[0][0] + "\t\t" + cats[0][1]);
   System.out.println(cats[1][0] + "\t\t" + cats[1][1]);
   System.out.println(cats[2][0] + "\t\t" + cats[2][1]);
   System.out.println(cats[3][0] + "\t\t" + cats[3][1]);
8. }
9. }
```

2. Modifikasi program praktik 1 untuk menampilkan array menggunakan perulangan for. Amati hasilnya dan jelaskan dalam laporan

```
1. public class Array2 {
2. public static void main(String[] args) {
3. String cats[][]= {{"terry","brown"},
4. {"kitty","white"},
5. {"toby","gray"},
6. {"fido","black"}};
7. System.out.println("Nama Kucing\tWarna");
8. for (int i=0;i<cats.length;i++) {
9. for (int j=0;j<cats[i].length;j++) {
10. System.out.print(cats[i][j]);
```

```
11. System.out.print("\t");
12. }
13. System.out.println(" ");
14. }
15. }
16. }
```

Array2_1.java * | Array2.java *

```
public class Array2_1 {
public static void main(String[] args) {
String cats[][]= {{"terry","brown"},
{"kitty","white"},
{"toby","gray"},
{"fido","black"}};
System.out.println("Nama Kucing\tWarna");
for (int i=0;i<cats.length;i++) {
for (int j=0;j<cats[i].length;j++) {
System.out.print(cats[i][j]);
System.out.print("\t");
}
System.out.println(" ");
}
}
}
```

Tool Output

```
Tool completed successfully
```

C:\WINDOWS\system32\cmd.

```
Nama Kucing     Warna
terry   brown
kitty   white
toby    gray
fido    black
Press any key to continue . . .
```

3. Modifikasi program nomor 2 agar dapat menerima inputan dari user.

Array2_2.java | Array2_1.java | Array2.java *

```
import java.util.Scanner;
public class Array2_2 {
public static void main(String[] args) {
String cats[][] = new String[4][2];
Scanner scanner = new Scanner(System.in);
System.out.println("Masukkan nama kucing ke-1: ");
cats[0][0] = scanner.nextLine();
System.out.println("Masukkan warna kucing ke-1: ");
cats[0][1] = scanner.nextLine();
System.out.println("Masukkan nama kucing ke-2: ");
cats[1][0] = scanner.nextLine();
System.out.println("Masukkan warna kucing ke-2: ");
cats[1][1] = scanner.nextLine();
System.out.println("Masukkan nama kucing ke-3: ");
cats[2][0] = scanner.nextLine();
System.out.println("Masukkan warna kucing ke-3: ");
cats[2][1] = scanner.nextLine();
System.out.println("Nama Kucing\tWarna");
for (int i=0;i<cats.length;i++) {
for (int j=0;j<cats[i].length;j++) {
System.out.print(cats[i][j]);
System.out.print("\t"); }
System.out.println(" ");
}
}
}
```

Tool Output

```
Tool completed successfully
```

C:\WINDOWS\system32\cmd.

```
Masukkan nama kucing ke-1:
terry
Masukkan warna kucing ke-1:
brown
Masukkan nama kucing ke-2:
kitty
Masukkan warna kucing ke-2:
white
Masukkan nama kucing ke-3:
toby
Masukkan warna kucing ke-3:
gray
Nama Kucing     Warna
terry   brown
kitty   white
toby    gray
null    null
Press any key to continue . . .
```

4. Cobalah program berikut dan Amati hasilnya dan jelaskan dalam laporan.

```
1. import java.util.Scanner;
2. public class Matrik {
3. public static void main(String[] args) {
4. Scanner input = new Scanner(System.in);
5.    int[][] x = {{1, 2, 3}, {4, 5, 6}};
6.    int[][] y = {{3, 6, 1}, {4, 7, 9}};
7.    int baris = 2;
```

```
8.   int kolom = 3;
9.   int[][] z = new int[baris][kolom];
10.        System.out.println("ini adalah matrix x");
11.        for (int i = 0; i < baris; i++) {
12.        for (int j = 0; j < kolom; j++) {
13.          System.out.print(x[i][j] + " ");
14.         }
15.         System.out.println();
16.        }
17.        System.out.println("ini adalah matrix y");
18.        for (int i = 0; i < baris; i++) {
19.         for (int j = 0; j < kolom; j++) {
20.          System.out.print(y[i][j] + " ");
21.         }
22.         System.out.println();
24.        }}}
```

5. Modifikasi program nomor 4 untuk menampilkan hasil output pengurangan dan penjumlahan dari matrik tersebut

```
Matrik.java × Array2_2.java Array2_1.java Array2.java *
import java.util.Scanner;
public class Matrik {
public static void main(String[] args) {
Scanner input = new Scanner(System.in);
  int[][] x = {{1, 2, 3}, {4, 5, 6}};
  int[][] y = {{3, 6, 1}, {4, 7, 9}};
  int baris = 2;
  int kolom = 3;
  int[][] z = new int[baris][kolom];
  System.out.println("ini adalah matrix x");
  for (int i = 0; i < baris; i++) {
  for (int j = 0; j < kolom; j++) {
   System.out.print(x[i][j] + " ");
   }
   System.out.println();
  }
  System.out.println("ini adalah matrix y");
  for (int i = 0; i < baris; i++) {
   for (int j = 0; j < kolom; j++) {
    System.out.print(y[i][j] + " ");
   }
   System.out.println();
    }
    }
    }
Tool Output

Tool completed successfully
```

```
C:\WINDOWS\system32\cmd.
ini adalah matrix x
1 2 3
4 5 6
ini adalah matrix y
3 6 1
4 7 9
Press any key to continue . . .
```

6. Cobalah program berikut untuk menampilkan Transpose dari matrik amati hasil outputnya

```
1. public class MatriksTranspose {
2.     public static void main(String[] args) {
3.     int[][] matriks = {{12,23,32},{34,56,63},{78,89,97}};
4.         int j,k;
5.    System.out.println("Matriks Sebelum Transpose ");
6.         for(j=0;j<3;j++){
7.             for(k=0;k<3;k++){
8.                 System.out.print(matriks[j][k]+" ");
9.             }
10.                System.out.println();
11.             }
12.      System.out.println("\nMatriks Setelah Transpose");
13.              for(j=0;j<3;j++){
14.                  for(k=0;k<3;k++){
15.                      System.out.print(matriks[k][j]+" ");
16.                  }
```

```
17.                     System.out.println();
18.                 }
19.             }
20. }
```

MatriksTranspose.java * | Matrik.java | Array2_2.java | Array2_1.java | Array2.java *

```
public class MatriksTranspose {
    public static void main(String[] args) {
    int[][] matriks = {{12,23,32},{34,56,63},{78,89,97}};
        int j,k;
  System.out.println("Matriks Sebelum Transpose ");
     for(j=0;j<3;j++){
         for(k=0;k<3;k++){
             System.out.print(matriks[j][k]+" ");
         }
              System.out.println();
          }
     System.out.println("\nMatriks Setelah Transpose");
            for(j=0;j<3;j++){
                for(k=0;k<3;k++){
                    System.out.print(matriks[k][j]+" ");
                }
                System.out.println();
            }
         }
}
```

Tool Output

```
Tool completed successfully
```

C:\WINDOWS\system32\cmd.

```
Matriks Sebelum Transpose
12 23 32
34 56 63
78 89 97

Matriks Setelah Transpose
12 34 78
23 56 89
32 63 97
Press any key to continue . . .
```

7. Buatlah program di bawah ini dan amati hasil outputnya

```
1. import java.util.Scanner;
2. public class Array2Dimensi1 {
3.       public static void main(String[] args){
4.         int b=3;int d=3; //matrik 3 baris 3 kolom
5.         System.out.println("Masukan Nilai Matrix:");
6.         int[][] matrix1=new int[b][d];
7.         for(int i=0;i<b;i++){
8.             for(int j=0;j<d;j++){
9.                 matrix1[i][j]=input();
10.                }
11.             }
12.             for(int i=0;i<b;i++){
13.                 for(int j=0;j<d;j++){
14.                     System.out.print(matrix1[i][j]+" ");
15.                 }
16.                 System.out.println();
17.             }
18.         }
```

```
19.          static int input(){
20.              Scanner a=new Scanner(System.in);
21.              int b=a.nextInt();
22.              return b;
23.          }
24.   }
```

Array2Dimensi1.java * | MatriksTranspose.java * | Matrik.java | Array2_2.java

```
import java.util.Scanner;
public class Array2Dimensi1 {
    public static void main(String[] args){
          int b=3;int d=3; //matrik 3 baris 3 kolom
          System.out.println("Masukan Nilai Matrix:");
      int[][] matrix1=new int[b][d];
      for(int i=0;i<b;i++){
         for(int j=0;j<d;j++){
                 matrix1[i][j]=input();
                   }
               }
               for(int i=0;i<b;i++){
                   for(int j=0;j<d;j++){
                       System.out.print(matrix1[i][j]+" ");
                   }
               System.out.println();
           }
       }
           static int input(){
               Scanner a=new Scanner(System.in);
           int b=a.nextInt();
               return b;
           }
       }
```

Tool Output

```
Tool completed successfully
```

C:\WINDOWS\system32\cmd.

```
Masukan Nilai Matrix:
10
20
30
40
50
60
70
80
90
10 20 30
40 50 60
70 80 90
Press any key to continue . . .
```

8. Ubahlah kembali praktik program no 7, agar menghasilkan perkalian matrik

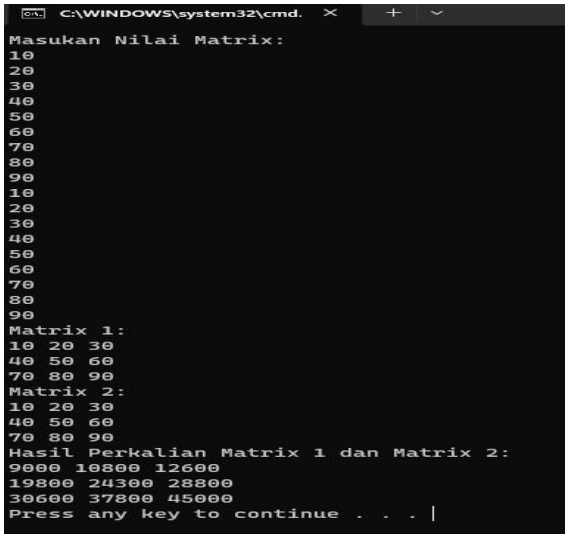
Modifikasi.java * | Modif_mhs.java | Array2Dimensi2.java | NilaiMahasisw

```
import java.util.Scanner;
public class Array2Dimensi2 {
    public static void main(String[] args){
        int b=3;int d=3; //matrik 3 baris 3 kolom
        System.out.println("Masukan Nilai Matrix:");
        int[][] matrix1=new int[b][d];
        for(int i=0;i<b;i++){
            for(int j=0;j<d;j++){
                matrix1[i][j]=input();
        }
    }
          int[][] matrix2=new int[b][d];
          for(int i=0;i<b;i++){
          for(int j=0;j<d;j++){
          matrix2[i][j]=input();
                  }
                  }
          int[][] matrix3=new int[b][d];
          for(int i=0;i<b;i++){
          for(int j=0;j<d;j++){
          for(int k=0;k<b;k++){
          for(int l=0;l<d;l++){
          matrix3[i][j]+=matrix1[i][k]*matrix2[k][j];
                          }
                      }
                  }
              }
        System.out.println("Matrix 1:");
            for(int i=0;i<b;i++){
            for(int j=0;j<d;j++){
        System.out.print(matrix1[i][j]+" "); }
        System.out.println(); }
        System.out.println("Matrix 2:");
```

```
System.out.println("Matrix 2:");
for(int i=0;i<b;i++){ for(int j=0;j<d;j++){
System.out.print(matrix2[i][j]+" "); }
System.out.println(); }
System.out.println("Hasil Perkalian Matrix 1 dan Matrix 2:");
    for(int i=0;i<b;i++){
    for(int j=0;j<d;j++){
        System.out.print(matrix3[i][j]+" "); }
        System.out.println(); }
                }
        static int input(){ Scanner a=new Scanner(System.in);
        int b=a.nextInt(); return b;}
                    }
```

ol Output

```
Tool completed successfully
```



B. LATIHAN

1. Buat program untuk menampilkan data nilai mahasiswa sebagai berikut :

Masukkan Jumlah Mahasiswa : 2

Mahasiswa 1
Nilai Tes 1 : 34
Nilai Tes 2 : 55
Nilai Tes 3 : 67

Mahasiswa 2
Nilai Tes 1 : 78
Nilai Tes 2 : 87
Nilai Tes 3 : 76

Daftar Nilai Mahasiswa :

	Test 1	Test 2	Test 3	Rata-rata
Mahasiswa 1	34	55	67	52.0
Mahasiswa 2	78	87	76	80.333336
Nilai Tertinggi	78	87	76	80.333336
Nilai Teredah	34	55	67	52.0

Press any key to continue . . .

Kode program :

```
1.  import java.util.Scanner;
2.  public class JavaApplication2 {
3.      public static void main(String[] args) throws Exception {
4.          Scanner input = new Scanner(System.in);
5.          int mhs,jml, banyakTes = 3, nilai[][], ntt[], ntr[];
6.          float rata[], jumlah[], rtt, rtr;
7.          System.out.print("Masukkan Jumlah Mahasiswa : ");
8.          mhs = input.nextInt();
9.          nilai = new int[mhs][banyakTes];
```

```
10.         jumlah = new float[mhs];
11.         rata = new float[mhs];
12.         ntt = new int[banyakTes];
13.         ntr = new int[banyakTes];
14.         System.out.println();
15.         for(int h=0;h<mhs;h++){ //Mahasiswa
16.             System.out.println("Mahasiswa " + (h+1));
17.             for(int i=0;i<banyakTes;i++){ //Tes keberapa
18.                 System.out.print("Nilai Tes " + (i+1) + " : ");
19.                 nilai[h][i] = input.nextInt();
20.                 jumlah[h] = jumlah[h] + nilai[h][i];
21.             }
22.             rata[h] = jumlah[h]/banyakTes;
23.             System.out.println();
24.         }
25.         for(int i=0;i<banyakTes;i++){
26.             ntt[i] = nilai[0][i];
27.             ntr[i] = nilai[0][i];
28.         }
29.         rtt = rata[0];
30.         rtr = rata[0];
31.         for(int i=0;i<banyakTes;i++){
32.             for(int j=0;j<mhs;j++){
33.                 if(ntt[i] < nilai[j][i]){
34.                     ntt[i] = nilai[j][i];
35.                 }
36.                 if(ntr[i] > nilai[j][i]){
37.                     ntr[i] = nilai[j][i];
38.                 }
39.             }
40.         }
41.         for(int i=0;i<mhs;i++){
42.             if(rtt < rata[i]){
43.                     rtt = rata[i];
44.                 }
45.                 if(rtr > rata[i]){
46.                     rtr = rata[i];
47.                 }
48.         }
49.         System.out.println("---------------------------");
50.         System.out.println("Daftar Nilai Mahasiswa : ");
51.         System.out.println("---------------------------");
52.         System.out.println();
53.      System.out.println("\t\tTest 1\tTest 2\tTest 3\tRata-rata");
54.         for(int j=0;j<mhs;j++){
55.             System.out.print("Mahasiswa " + (j+1));
56.             for(int k=0;k<banyakTes;k++){
57.                 System.out.print("\t" + nilai[j][k]);
58.             }
59.             System.out.print("\t" + rata[j]);
60.             System.out.println();
61.         }
62.         System.out.println();
63.         System.out.print("Nilai Tertinggi\t");
64.         for(int j=0;j<banyakTes;j++){//Nilai tertinggi
65.             System.out.print(ntt[j] + "\t");
66.         }
67.         System.out.print(rtt);//Rata-rata tertinggi
68.         System.out.println();
69.         System.out.print("Nilai Teredah\t");
70.         for(int j=0;j<banyakTes;j++){//Nilai terendah
71.             System.out.print(ntr[j] + "\t");
72.         }
73.         System.out.print(rtr);//Rata-rata terendah
74.         System.out.println();
75.     }
76.       }
```

```
Array2Dimensi2.java *  NilaiMahasiswa_1.java *  MatriksTranspose.java *  Matrik.jav

import java.util.Scanner;
public class NilaiMahasiswa_1 {
    public static void main(String[] args) throws Exception {
        Scanner input = new Scanner(System.in);
        int mhs, jml, banyakTes = 3, nilai[][], ntt[], ntr[];
        float rata[], jumlah[], rtt, rtr;

        System.out.print("Masukkan Jumlah Mahasiswa : ");
        mhs = input.nextInt();
        nilai = new int[mhs][banyakTes];
        jumlah = new float[mhs];
        rata = new float[mhs];
        ntt = new int[banyakTes];
        ntr = new int[banyakTes];

        System.out.println();
        for(int h=0;h<mhs;h++){ //Mahasiswa
            System.out.println("Mahasiswa " + (h+1));
            for(int i=0;i<banyakTes;i++){ //Tes keberapa
                System.out.print("Nilai Tes " + (i+1) + " : ");
                nilai[h][i] = input.nextInt();
                jumlah[h] = jumlah[h] + nilai[h][i];
            }
            rata[h] = jumlah[h]/banyakTes;
            System.out.println();
        }
        for(int i=0;i<banyakTes;i++){
            ntt[i] = nilai[0][i];
            ntr[i] = nilai[0][i];
        }
        for(int i=0;i<mhs;i++){
            for(int j=0;j<banyakTes;j++){
                if(ntt[j] < nilai[i][j]){
                    ntt[j] = nilai[i][j];
                }
                if(ntr[j] > nilai[i][j]){
                    ntr[j] = nilai[i][j];
                }
            }
        }
        rtt = rata[0];
        rtr = rata[0];

        for(int i=0;i<mhs;i++){
            if(rtt < rata[i]){
                rtt = rata[i];
            }
            if(rtr > rata[i]){
                rtr = rata[i];
            }
        }
        System.out.println("---------------------------");
        System.out.println("Daftar Nilai Mahasiswa : ");
        System.out.println("---------------------------");
        System.out.println();
        System.out.println("\t\tTest 1\tTest 2\tTest 3\tRata-rata");
        for(int j=0;j<mhs;j++){
            System.out.print("Mahasiswa " + (j+1));

            for(int k=0;k<banyakTes;k++){
                System.out.print("\t" + nilai[j][k]);
            }
            System.out.print("\t" + rata[j]);
            System.out.println();
        }
        System.out.println();
        System.out.print("Nilai Tertinggi\t");
        for(int j=0;j<banyakTes;j++){//Nilai tertinggi
            System.out.print(ntt[j] + "\t");
        }
        System.out.print(rtt);//Rata-rata tertinggi
        System.out.println();
        System.out.print("Nilai Teredah\t");
        for(int j=0;j<banyakTes;j++){//Nilai terendah
            System.out.print(ntr[j] + "\t");
        }
        System.out.print(rtr);//Rata-rata terendah
        System.out.println();
    }
}
```

```
Tool Output

Tool completed successfully
```

```
C:\WINDOWS\system32\cmd.

Masukkan Jumlah Mahasiswa : 2

Mahasiswa 1
Nilai Tes 1 : 34
Nilai Tes 2 : 55
Nilai Tes 3 : 67

Mahasiswa 2
Nilai Tes 1 : 78
Nilai Tes 2 : 87
Nilai Tes 3 : 76

---------------------------
Daftar Nilai Mahasiswa :
---------------------------

                Test 1  Test 2  Test 3  Rata-rata
Mahasiswa 1     34      55      67      52.0
Mahasiswa 2     78      87      76      80.333336

Nilai Tertinggi 78      87      76      80.333336
Nilai Teredah   34      55      67      52.0
Press any key to continue . . .
```

2. Modifikasi program Latihan 1 untuk menambah data inputan menampilkan : Nama, Nim dan Jurusan

Modifikasi.java | Modif_mhs.java | Array2Dimensi2.java * | NilaiMahasiswa_1.java * | MatriksTranspose.java *

```
import java.util.Scanner;
public class Modifikasi {
    public static void main(String[] args) throws Exception {
        Scanner input = new Scanner(System.in);
        int mhs, banyakTes = 3;
        String nama[], nim[], jurusan[];
        int nilai[][], ntt[], ntr[];
        float rata[], jumlah[], rtt, rtr;

        System.out.print("Masukkan Jumlah Mahasiswa : ");
        mhs = input.nextInt();

        nilai = new int[mhs][banyakTes];
        jumlah = new float[mhs];
        rata = new float[mhs];
        ntt = new int[banyakTes];
        ntr = new int[banyakTes];
        nama = new String[mhs];
        nim = new String[mhs];
        jurusan = new String[mhs];

        System.out.println();
        for (int h = 0; h < mhs; h++) { // Mahasiswa
            System.out.println("Mahasiswa " + (h + 1));
            System.out.print("NIM : ");
            nim[h] = input.next();
            System.out.print("Nama : ");
            nama[h] = input.next();
            System.out.print("Jurusan : ");
            jurusan[h] = input.next();

            for (int i = 0; i < banyakTes; i++) { // Tes keberapa
                System.out.print("Nilai Tes " + (i + 1) + " : ");
```

Modifikasi.java * | Modif_mhs.java | Array2Dimensi2.java * | NilaiMahasiswa_1.java *

```
            jurusan[h] = input.next();

            for (int i = 0; i < banyakTes; i++) { // Tes keberapa
                System.out.print("Nilai Tes " + (i + 1) + " : ");
                nilai[h][i] = input.nextInt();
                jumlah[h] = jumlah[h] + nilai[h][i];
            }
            rata[h] = jumlah[h] / banyakTes;
            System.out.println();
        }

        for (int i = 0; i < banyakTes; i++) {
            ntt[i] = nilai[0][i];
            ntr[i] = nilai[0][i];
        }
        rtt = rata[0];
        rtr = rata[0];
        for (int i = 0; i < banyakTes; i++) {
            for (int j = 0; j < mhs; j++) {
                if (ntt[i] < nilai[j][i]) {
                    ntt[i] = nilai[j][i];
                }
                if (ntr[i] > nilai[j][i]) {
                    ntr[i] = nilai[j][i];
                }
            }
        }
        for (int i = 0; i < mhs; i++) {
            if (rtt < rata[i]) {
                rtt = rata[i];
            }
            if (rtr > rata[i]) {
                rtr = rata[i];
```

Modifikasi.java * | Modif_mhs.java | Array2Dimensi2.java * | NilaiMahasiswa_1.java * | MatriksTranspose.java * | Matrik.java | Array2_2.java

```
        }

        System.out.println("--------------------------");
        System.out.println("Daftar Nilai Mahasiswa : ");
        System.out.println("--------------------------");
        System.out.println();
        System.out.println("\t\tTest 1\tTest 2\tTest 3\tRata-rata");
        for (int j = 0; j < mhs; j++) {
            System.out.print("Mahasiswa " + (j + 1) + "\t" + nim[j] + "\t" + nama[j] + "\t" + jurusan[j]);
            for (int k = 0; k < banyakTes; k++) {
                System.out.print("\t" + nilai[j][k]);
            }
            System.out.print("\t" + rata[j]);
            System.out.println();
        }
        System.out.println();
        System.out.print("Nilai Tertinggi\t");
        for (int j = 0; j < banyakTes; j++) {// Nilai tertinggi
            System.out.print(ntt[j] + "\t");
        }
        System.out.print(rtt);// Rata-rata tertinggi
        System.out.println();
        System.out.print("Nilai Terendah\t");
        for (int j = 0; j < banyakTes; j++) {// Nilai terendah
            System.out.print(ntr[j] + "\t");
        }
        System.out.print(rtr);// Rata-rata terendah
        System.out.println();
    }
}
```

ool Output

Tool completed successfully

C:\WINDOWS\system32\cmd.

```
Masukkan Jumlah Mahasiswa : 2

Mahasiswa 1
NIM : 233210006
Nama : Jesika
Jurusan : sia
Nilai Tes 1 : 34
Nilai Tes 2 : 55
Nilai Tes 3 : 67

Mahasiswa 2
NIM : 233210010
Nama : Fia
Jurusan : sia
Nilai Tes 1 : 78
Nilai Tes 2 : 87
Nilai Tes 3 : 76

--------------------------
Daftar Nilai Mahasiswa :
--------------------------

                Test 1  Test 2  Test 3  Rata-rata
Mahasiswa 1     233210006       Jesika  sia     34      55      67      52.0
Mahasiswa 2     233210010       Fia     sia     78      87      76      80.333336

Nilai Tertinggi 78      87      76      80.333336
Nilai Terendah  34      55      67      52.0
Press any key to continue . . .
```