Mata Kuliah : PBO – TI – SI

Pertemuan : 5

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PRAKTIKUM 5

Latihan 1

```
D:\Kuliah\Semester_4\PBO\PRAKTIKUM5>java Faktorial
Bilangan : 20
1 x 2 = 2
2 x 3 = 6
6 x 4 = 24
24 x 5 = 120
120 x 6 = 720
720 x 7 = 5040
5040 x 8 = 40320
40320 x 9 = 362880
362880 x 10 = 3628800
3628800 x 11 = 39916800
39916800 x 12 = 479001600
479001600 x 13 = 6227020800
6227020800 x 14 = 87178291200
87178291200 x 15 = 1307674368000
1307674368000 x 16 = 20922789888000
20922789888000 x 17 = 355687428096000
355687428096000 x 18 = 6402373705728000
6402373705728000 x 19 = 121645100408832000
121645100408832000 x 20 = 2432902008176640000
```

Code Faktorial.java

```
import java.util.Scanner;
public class Faktorial {
	public static void main(String[] args) {
		long fak=1;
		int bil;
```

```
            Scanner in=new Scanner(System.in);
            System.out.print("Bilangan : ");
            bil=in.nextInt();
            for(int i=2;i<=bil;i++){
                System.out.print(fak+" x " +i+" = ");
                fak = fak *i;
                System.out.println(fak);
            }
        }
}
```

Latihan 2

```
D:\Kuliah\Semester_4\PBO\PRAKTIKUM5>java Pecah
Bilangan : 20
1 2 3 4 5
6 7 8 9 10
11 12 13 14 15
16 17 18 19 20
Dipecah : 2
1 2
3 4
5 6
7 8
9 10
11 12
13 14
15 16
17 18
19 20
```

Code Pecah.java

```
import java.util.Scanner;
public class Pecah {
        public static void main(String[] args) {
            long fak=1;
```

```
        int bil,p;
        Scanner in=new Scanner(System.in);
        System.out.print("Bilangan : ");
        bil=in.nextInt();
        for(int i=1;i<=bil;i++){
            System.out.print(i+" ");
            if(i%5==0)
                System.out.println("");
        }
        System.out.print("Dipecah : ");
        p=in.nextInt();
        for(int i=1;i<=bil;i++){
            System.out.print(i+" ");
            if(i%p==0)
                System.out.println("");
        }
    }
}
```

ARRAY

```
D:\Kuliah\Semester_4\PBO\PRAKTIKUM5>java SingleArray
Nilai x[0] : 20
Nilai x[1] : 10
Nilai x[2] : 30
```

```
D:\Kuliah\Semester_4\PBO\PRAKTIKUM5>java MatrixExample
Row size= 2
Column size = 3
[ 1 3 5 ]
[ 2 4 6 ]
```

Latihan 1

```
D:\Kuliah\Semester_4\PBO\PRAKTIKUM5>java Array1
Jumlah Data : 5
Data ke- 1 = 1
Data ke- 2 = 5
Data ke- 3 = 3
Data ke- 4 = 2
Data ke- 5 = 7
Hasil data[0]=1
Hasil data[1]=5
Hasil data[2]=3
Hasil data[3]=2
Hasil data[4]=7
```

Code Array1.java

```
import java.util.Scanner;
public class Array1 {
	public static void main(String[] args) {
		int j;
		int[] data;
		Scanner in=new Scanner(System.in);
		System.out.print("Jumlah Data : ");
		j=in.nextInt();
		data=new int[j];
		for(int i=0;i<j;i++){
			System.out.print("Data ke- " +(i+1)+" = ");
			data[i]=in.nextInt();
		}
		//cetak
		for(int i=0;i<j;i++){
			System.out.println("Hasil data["+i+"]="+data[i]);
		}
	}
}
```

Latihan 2

```
Input data lagi [Y/T]?
T
Jumlah Mahasiswa : 2
Mahasiswa ke : 1
Nim : A11202214705
Nama : Aku
Nilai Tugas : 96
Nilai UTS : 70
Nilai UAS : 88
NIM : A11202214705
Nama : Aku
Nilai Tugas : 96.030% : 30.8
Nilai UTS : 70.030% : 24.5
Nilai UAS : 88.030% : 30.8
Nilai Akhir : 86.1
Nilai Huruf : A
Predikat : Apik
Mahasiswa ke : 2
Nim : A11202214706
Nama : Dia
Nilai Tugas : 70
Nilai UTS : 86
Nilai UAS : 66
NIM : A11202214706
Nama : Dia
Nilai Tugas : 70.030% : 23.1
Nilai UTS : 86.030% : 30.1
Nilai UAS : 66.030% : 23.1
Nilai Akhir : 76.3
Nilai Huruf : B
Predikat : Baik
Daftar Nilai PBO
==================
NIM     Nama    N.Tugas N.UTS   N.UAS   N.Akhir N.Huruf Predikat
A11202214705    Aku     96.0    70.0    88.0    86.1    A       Apik
A11202214706    Dia     70.0    86.0    66.0    76.3    B       Baik
```

Code Nilai.java

```
import java.util.Scanner;

public class Nilai {


    String nim, nama, nHuruf, predikat ;

    float nilaiUts, nilaiTugas, nilaiUas,pNilaiUts, pNilaiTugas, pNilaiUas, nilaiAkhir;

    Scanner myObj = new Scanner(System.in);
```

```
	void isiData(String nim, String nama, float nilaiUts, float nilaTugas, float nilaiUas)
	{
		this.nim=nim;
		this.nama=nama;
		this.nilaiTugas=nilaiTugas;
		this.nilaiUts=nilaiUts;
		this.nilaiUas=nilaiUas;
	}
	void setNim(String nim){
		this.nim=nim;
	}
	String getNim(){
		return nim;
	}
	void inputData(){
		System.out.print ("Nim : ");nim=myObj.nextLine();
		System.out.print ("Nama : ");nama=myObj.nextLine();
		System.out.print ("Nilai Tugas : ");nilaiTugas=myObj.nextFloat();
		System.out.print ("Nilai UTS : ");nilaiUts=myObj.nextFloat();
		System.out.print ("Nilai UAS : ");nilaiUas=myObj.nextFloat();
	}
	void hitungNilai(){
		pNilaiUts=.35f*nilaiUts;
		pNilaiTugas=.35f*nilaiUas;
		pNilaiUas=.35f*nilaiUas;
		nilaiAkhir=pNilaiTugas+pNilaiUts+pNilaiUas;
	}
```

```
    void cetakNilai(){
            System.out.println("NIM : "+nim);
            System.out.println("Nama : "+nama);
            System.out.println("Nilai Tugas : "+nilaiTugas+"30% : "+pNilaiTugas);
            System.out.println("Nilai UTS : "+nilaiUts+"30% : "+pNilaiUts);
            System.out.println("Nilai UAS : "+nilaiUas+"30% : "+pNilaiUas);
            System.out.println("Nilai Akhir : "+nilaiAkhir);
            System.out.println("Nilai Huruf : "+getNilHuruf(nilaiAkhir));
            System.out.println("Predikat : "+getPredikat(nHuruf));

    }

    String getNilHuruf(float nilai)
    {
            if (nilai >= 85)
    nHuruf = "A";
            else if (nilai >= 80 && nilai < 85)
                    nHuruf = "AB";
  else if (nilai >= 70 && nilai < 80)
    nHuruf = "B";
            else if (nilai >= 65 && nilai < 70)
    nHuruf = "BC";
  else if (nilai >= 60 && nilai < 65)
    nHuruf = "C";
  else if (nilai >= 40 && nilai < 60)
    nHuruf = "D";
  else
```

```
    nHuruf = "E";
return nHuruf;

    }
    String getPredikat(String huruf) {
switch (huruf) {
    case "A":
        predikat = "Apik";
        break;
                        case "AB":
        predikat = "Apik Baik";
        break;
    case "B":
        predikat = "Baik";
        break;
                        case "BC":
        predikat = "Baik Cukup";
        break;
    case "C":
        predikat = "Cukup";
        break;
    case "D":
        predikat = "Dablek";
        break;
    default:
        predikat = "Elek";
}
return predikat;
```

```
    }
        void judul() {
            System.out.println("Daftar Nilai PBO");
            System.out.println("==================");

        System.out.println("NIM\tNama\tN.Tugas\tN.UTS\tN.UAS\tN.Akhir"+"\t
N.Huruf\tPredikat");
        }
        void daftarNilai(){

        System.out.println(nim+"\t"+nama+"\t"+nilaiTugas+"\t"+nilaiUts+"\t"+nil
aiUas+"\t"+nilaiAkhir+"\t"+nHuruf+"\t"+predikat);
        }
}
```

Code TestNilai.java

```
import java.util.Scanner;
import java.io.*;
public class TestNilai{

        public static void main (String[] a){
            String jawab="";
            Scanner input = new Scanner(System.in);
            Nilai nilaiku=new Nilai();
            nilaiku.nim="A11202214667";
            nilaiku.nama="Nila";
            nilaiku.nilaiTugas=99;
            nilaiku.nilaiUts=87;
            nilaiku.nilaiUas=98;
            nilaiku.hitungNilai();
```

```
nilaiku.cetakNilai();

Nilai nilaimu=new Nilai();

nilaimu.nim="A11202214704";
nilaiku.nama="Valen";
nilaiku.nilaiTugas=98;
nilaiku.nilaiUts=87;
nilaiku.nilaiUas=99;
nilaiku.hitungNilai();
nilaiku.cetakNilai();

do{
      Nilai nilaiDia = new Nilai();
      nilaiDia.inputData();
      nilaiDia.hitungNilai();
      nilaiDia.cetakNilai();

      System.out.println("Input data lagi [Y/T]? ");
         jawab=input.nextLine();
  } while(jawab.equalsIgnoreCase("Y"));

System.out.print("Jumlah Mahasiswa : ");
int n=input.nextInt();
Nilai[] nilaibyk=new Nilai[n];
for(int i=0;i<n;i++){
         System.out.println("Mahasiswa ke : "+(i+1));
         nilaibyk[i]=new Nilai();
```

```
                nilaibyk[i].inputData();
                nilaibyk[i].hitungNilai();
                nilaibyk[i].cetakNilai();
            }
            nilaibyk[0].judul();
            for(int i=0;i<n;i++){
                nilaibyk[i].daftarNilai();
            }
        }
}
```

Latihan 3

```
D:\Kuliah\Semester_4\PBO\PRAKTIKUM5>java Sorting
Masukkan bilangan: 20 30 42 22

Bubble Sort:
20 30 22 42
20 22 30 42


Quick Sort:
20 30 42 22
20 22 42 30
20 22 30 42

Insertion Sort:
20 30 42 22
20 30 42 22
20 22 30 42

Selection Sort:
20 30 42 22
20 22 42 30
20 22 30 42

Merge Sort:
20 30 42 22
20 30 22 42
20 22 30 42
```

Code Sorting.java

```
import java.util.Scanner;
```

```
public class Sorting{
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        System.out.print("Masukkan bilangan: ");
        String input = scanner.nextLine();
        String[] inputArr = input.split(" ");
        int[] arr = new int[inputArr.length];
        for (int i = 0; i < inputArr.length; i++) {
            arr[i] = Integer.parseInt(inputArr[i]);
        }

        System.out.println("\nBubble Sort:");
        Sorting.bubbleSort(arr.clone());

        System.out.println("\nQuick Sort:");
        Sorting.quickSort(arr.clone(), 0, arr.length - 1);

        System.out.println("\nInsertion Sort:");
        Sorting.insertionSort(arr.clone());

        System.out.println("\nSelection Sort:");
        Sorting.selectionSort(arr.clone());

        System.out.println("\nMerge Sort:");
        Sorting.mergeSort(arr.clone(), 0, arr.length - 1);
    }

    static void bubbleSort(int arr[]){
```

```
    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]) {
                int temp = arr[j];
                arr[j] = arr[j + 1];
                arr[j + 1] = temp;
                printArray(arr);
            }
        }
    }
    System.out.println();
}
static void swap(int[] arr, int i, int j){
    int temp = arr[i];
    arr[i] = arr[j];
    arr[j] = temp;
}
static void quickSort(int[] arr, int low, int high){
    if (low < high) {
        int pivot = arr[high];
        int i = (low - 1);
        for(int j = low; j <= high - 1; j++) {
            if (arr[j] < pivot) {
                i++;
                swap(arr, i, j);
                printArray(arr);
            }
```

```
        }
        swap(arr, i + 1, high);
        quickSort(arr, low, i - 1);
        quickSort(arr, i + 1, high);
    }
}
public static void insertionSort(int arr[]){
    int n = arr.length;
    for (int i = 1; i < n; ++i) {
        int key = arr[i];
        int j = i - 1;
        while (j >= 0 && arr[j] > key) {
            arr[j + 1] = arr[j];
            j = j - 1;
        }
        arr[j + 1] = key;
        printArray(arr);
    }
}
public static void selectionSort(int arr[]){
    int n = arr.length;
    for (int i = 0; i < n-1; i++){
        int min_idx = i;
        for (int j = i+1; j < n; j++)
        if (arr[j] < arr[min_idx])
        min_idx = j;
        int temp = arr[min_idx];
        arr[min_idx] = arr[i];
```

```
            arr[i] = temp;
            printArray(arr);
        }
    }
    public static void merge(int arr[], int l, int m, int r){
        int n1 = m - l + 1;
        int n2 = r - m;
        int L[] = new int[n1];
        int R[] = new int[n2];
        for (int i = 0; i < n1; ++i)
        L[i] = arr[l + i];
        for (int j = 0; j < n2; ++j)
        R[j] = arr[m + 1 + j];
        int i = 0, j = 0;
        int k = l;
        while (i < n1 && j < n2) {
            if (L[i] <= R[j]) {
                arr[k] = L[i];
                i++;
            }
            else {
                arr[k] = R[j];
                j++;
            }
            k++;
        }
        while (i < n1) {
            arr[k] = L[i];
```

```
            i++;
            k++;
            printArray(arr);
        }

        while (j < n2) {
            arr[k] = R[j];
            j++;
            k++;
            printArray(arr);
        }
    }
    public static void mergeSort(int arr[], int l, int r){
        if (l < r) {
            int m = l + (r - l) / 2;
            mergeSort(arr, l, m);
            mergeSort(arr, m + 1, r);
            merge(arr, l, m, r);
        }
    }
    static void printArray(int arr[]){
        int n = arr.length;
        for (int i = 0; i < n; ++i) {
            System.out.print(arr[i] + " ");
        }
        System.out.println();
    }
}
```

Latihan 4

```
D:\Kuliah\Semester_4\PBO\PRAKTIKUM5>java Matriks
input baris matrix A=2
input kolom matrix A=3
input elemen matrix A [0,0] =2
input elemen matrix A [0,1] =4
input elemen matrix A [0,2] =1
input elemen matrix A [1,0] =4
input elemen matrix A [1,1] =2
input elemen matrix A [1,2] =6
input baris matrix B=3
input kolom matrix B=3
input elemen matrix B [0,0] =3
input elemen matrix B [0,1] =5
input elemen matrix B [0,2] =2
input elemen matrix B [1,0] =1
input elemen matrix B [1,1] =5
input elemen matrix B [1,2] =3
data tidak dapat diproses

Hasil perkalian matrix A dengan matrix B =

10  30  16
14  30  14
```

Code Matriks.java

```
import java.util.Scanner;


public class Matriks {
   public static void main(String[] args) {
      Scanner in = new Scanner(System.in);
      int[][] A = new int[10][10];
      int[][] B = new int[10][10];
      int[][] C = new int[10][10];
      int[][] D = new int[10][10];
      int[][] E = new int[10][10];
      int jlh = 0, hsl = 1, i, j, n, m, a, b, k;
      System.out.print("input baris matrix A=");
      n = in.nextInt();
      System.out.print("input kolom matrix A=");
```

```
m = in.nextInt();
for (i = 0; i < n; i++) {
  for (j = 0; j < m; j++) {
    System.out.print("input elemen matrix A [" + i + "," + j + "] =");
    A[i][j] = in.nextInt();
  }
}
System.out.print("input baris matrix B=");
a = in.nextInt();
System.out.print("input kolom matrix B=");
b = in.nextInt();
for (i = 0; i < n; i++) {
  for (j = 0; j < m; j++) {
    System.out.print("input elemen matrix B [" + i + "," + j + "] =");
    B[i][j] = in.nextInt();
  }
}
if (n == a && m == b) {
  System.out.println("Hasil penjumlahan matrik A\n");
  for (i = 0; i < n; i++) {
    for (j = 0; j < m; j++) {
      C[i][j] = A[i][j] + B[i][j];
      System.out.print(C[i][j] + "  ");
    }
    System.out.println();
  }
  System.out.println("\nHasil transfos matrix C=\n");
  for (i = 0; i < n; i++) {
```

```
        for (j = 0; j < m; j++) {
          D[i][j] = C[j][i];
          System.out.print(D[i][j] + "   ");
        }
        System.out.println();
      }
    } else
      System.out.println("data tidak dapat diproses");
    if (m == a) {
      for (i = 0; i < n; i++) {
        for (j = 0; j < b; j++) {
          E[i][j] = 0;
          for (k = 0; k < a; k++) {
            E[i][j] = E[i][j] + (A[i][k] * B[k][j]);
          }
        }
      }
      System.out.println("\nHasil perkalian matrix A dengan matrix B =\n");
      for (i = 0; i < n; i++) {
        for (j = 0; j < b; j++) {
          System.out.print(E[i][j] + "   ");
        }
        System.out.println();
      }
    } else
      System.out.println("data tidak bisa di proses");
  }
}
```

```
D:\Kuliah\Semester_4\PBO\PRAKTIKUM5>java QueueImplement

QUEUE OPERATIONS
1. Insert
2. Remove
3. Peek
4. Check Empty
5. Check Full
6. Size
7. Exit

Your Choice ? : 3
Queue empty!

Do you want to continue? <Y or N> : y

QUEUE OPERATIONS
1. Insert
2. Remove
3. Peek
4. Check Empty
5. Check Full
6. Size
7. Exit

Your Choice ? : 1

Input number : 3
Queue = [3]
Do you want to continue? <Y or N> : n
```

Code QueueImplement.java

```
import java.util.LinkedList;
import java.util.Queue;
import java.util.Scanner;

public class QueueImplement {
    public static void main(String[] args) {
        QueueImplement mine = new QueueImplement();
        mine.menu();
    }

    Queue<Integer> antrian = new LinkedList<>();
    Scanner input = new Scanner(System.in);
    int max = 5, top = 0;

    public void insert() {
```

```
    System.out.print("\nInput number : ");
    antrian.add(input.nextInt());
    this.top++;
}

public void pop() {
    System.out.print("Select the data you want to delete  : ");
    antrian.remove(input.nextInt());
    this.top--;
}

public void menu() {
    String choose;
    do {
        System.out.println("\nQUEUE OPERATIONS");
        System.out.println("1. Insert");
        System.out.println("2. Remove");
        System.out.println("3. Peek");
        System.out.println("4. Check Empty");
        System.out.println("5. Check Full");
        System.out.println("6. Size");
        System.out.println("7. Exit");
        System.out.print("\nYour Choice ? : ");
        int pilih = input.nextInt();
        switch (pilih) {
            case 1:
                if (top < max) {
                    insert();
```

```
            System.out.println("Queue = " + antrian);
        } else {
            System.out.println("Queue full!\n");
        }
        break;
    case 2:
        if (top != 0) {
            System.out.println("Queue = " + antrian);
            pop();
            System.out.println("New Queue = " + antrian);
        } else {
            System.out.println("Queue empty!\n");
        }
        break;
    case 3:
        if (top != 0) {
            System.out.println("First Data in the Queue = " + antrian.peek());
        } else {
            System.out.println("Queue empty!\n");
        }
        break;
    case 4:
        if (top == 0) {
            System.out.println("Queue is empty");
        } else {
            System.out.println("Queue is not empty");
        }
        break;
```

```
            case 5:
                if (top == max) {
                    System.out.println("Queue full!\n");
                } else {
                    System.out.println((max - top) + " more slot(s) available");
                }
                break;
            case 6:
                System.out.println("Size = " + antrian.size());
                System.out.println("Queue = " + antrian);
                break;
            case 7:
                input.close();
                System.exit(0);
            default:
                System.out.println("Invalid input!\n");
                break;
            }
            System.out.print("Do you want to continue? <Y or N> : ");
            choose = input.next();
        } while (choose.equalsIgnoreCase("Y"));
        input.close();
    }
}
```