Tugas Relasi Antar Kelas
Pemrograman Berbasis Objek

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https://github.com/FawwasSabil25/PBO_223040114/tree/main/src/Pertemuan5

Mahasiswa.Java

```java
package Pertemuan5;

public class Mahasiswa {
    private String NRP;
    private String nama;
    public char[] display;

    public Mahasiswa(String NRP, String nama){
        super();
        this.NRP = NRP;
        this.nama = nama;
    }

    public void setNRP(String NRP){
        this.NRP = NRP;
    }

    public String getNRP(){
        return NRP;
    }

    public void setNama(String nama){
        this.nama = nama;
    }

    public String getNama(){
        return nama;
    }

    public String display(){
        return "NRP : " + NRP + ", Nama : " + nama;
    }
}
```

MataKuliah.Java

```java
package Pertemuan5;

public class MataKuliah {
    private String kode;
    private String nama;
    private int sks;
    private String indexNilai;

    public MataKuliah(String kode, String nama, String indexNilai, int sks){
        this.kode = kode;
        this.nama = nama;
        this.sks = sks;
        this.indexNilai = indexNilai;
    }

    //setter n getter
    public void setKode(String kode){
        this.kode = kode;
    }

    public String getKode(){
        return kode;
    }

    public void setNama(String nama){
        this.nama = nama;
    }

    public String getNama(){
        return nama;
    }

    public void setSKS(int sks){
        this.sks = sks;
    }

    public int getSKS(){
        return sks;
    }

    public void setIndexNilai(String indexNilai){
        this.indexNilai = indexNilai;
    }
```

```java
    public String getIndexNilai(){
        return indexNilai;
    }

    public double nilaiIndex(){
        switch (indexNilai.toUpperCase()) {
            case "A":
                return 4.0;
            case "B":
                return 3.0;
            case "C":
                return 2.0;
            case "D":
                return 1.0;
            case "E":
                return 0.0;
            default:
                return 0.0;
        }
    }

    public Object display() {
        return kode + " - " + nama + " - " + indexNilai + " - " + sks;
    }

}
```

KartuHasilStudi.java

```java
package Pertemuan5;

import java.util.ArrayList;
import java.util.List;

public class KartuHasilStudi {
    private String semester;
    private double ips;
    private List<MataKuliah> daftarMataKuliah;

    public KartuHasilStudi(String semester){
        this.semester = semester;
        this.daftarMataKuliah = new ArrayList<>();
    }
```

```java
    public void addMataKuliah(MataKuliah matakuliah){
        daftarMataKuliah.add(matakuliah);
    }

    public String display(){
        StringBuilder sb = new StringBuilder();
        for(MataKuliah mk : daftarMataKuliah){
            sb.append(mk.display());
            sb.append("\n");
        }
        return sb.toString();
    }

    public void hitungIPS(){
        double totalSKS = 0;
        double totalNilai = 0;

        for(MataKuliah mataKuliah : daftarMataKuliah){
            totalSKS += mataKuliah.getSKS();
            totalNilai += mataKuliah.getSKS() * mataKuliah.nilaiIndex();
        }
        this.ips = totalSKS > 0 ? totalNilai / totalSKS : 0; // Menambahkan
pengecekan untuk pembagian dengan 0
    }

    // Setter & Getter
    public String getSemester() {
        return semester;
    }

    public void setSemester(String semester) {
        this.semester = semester;
    }

    public void setIPS(double ips){
        this.ips = ips;
    }

    public double getIPS() {
        return ips;
    }

    public List<MataKuliah> getDaftarMataKuliah() {
        return daftarMataKuliah;
```

```
    }
}
```

TranskripNilai.java

```java
package Pertemuan5;

import java.util.ArrayList;
import java.util.Date;
import java.util.List;

public class TranskripNilai {
    private Date tglCetak;
    private double ipk = 0.0;
    private List<KartuHasilStudi> kartuhasilstudi;
    private Mahasiswa mahasiswa;

    public TranskripNilai(Mahasiswa mahasiswa){
        super();
        this.mahasiswa = mahasiswa;

        kartuhasilstudi = new ArrayList<KartuHasilStudi>();
        tglCetak = new Date();
    }

    public void hitungIPK(){
        double totalNilai = 0.0;
        double totalSKS = 0.0;

        for (KartuHasilStudi khs : kartuhasilstudi) {
            List<MataKuliah> daftarMataKuliah = khs.getDaftarMataKuliah();
            for (MataKuliah mk : daftarMataKuliah) {
                totalNilai += mk.nilaiIndex() * mk.getSKS();
                totalSKS += mk.getSKS();
            }
        }

        // Memastikan tidak dibagi dengan nol
        if (totalSKS != 0) {
            ipk = totalNilai / totalSKS;
        } else {
            // Jika totalSKS sama dengan nol, maka set nilai IPK menjadi 0.0
            ipk = 0.0;
        }
```

```java
    }

    public void addKHS(KartuHasilStudi khs){
        kartuhasilstudi.add(khs);
    }

    public void display(){
        System.out.println("NRP: " + mahasiswa.getNRP() + ", Nama: " +
mahasiswa.getNama());
        System.out.println("Tanggal Cetak: " + tglCetak);
        System.out.println("IPK: " + ipk);
        for (KartuHasilStudi khs : kartuhasilstudi) {
            System.out.println(khs.display());
        }
    }

    //setter n getter
    public Mahasiswa getMahasiswa() {
        return mahasiswa;
    }

    public void setMahasiswa(Mahasiswa mahasiswa) {
        this.mahasiswa = mahasiswa;
    }

    public Date getTglCetak() {
        return tglCetak;
    }

    public double getIpk() {
        return ipk;
    }

}
```

TranskripNilaiMain.java

```java
package Pertemuan5;

public class TranskripNilaiMain {
    public static void main(String[] args) {
        //create objek matakuliah
    MataKuliah mk1 = new MataKuliah("001", "Algoritma Pemorgraman 1", "A", 3);
    MataKuliah mk2 = new MataKuliah("002", "Algoritma Pemorgraman 2", "BC", 3);
```

```java
    MataKuliah mk3 = new MataKuliah("003", "Pemrograman Berorientasi Objek", "B",
3);

    //create objek KHS
    KartuHasilStudi khs = new KartuHasilStudi("20222");
    khs.addMataKuliah(mk1);
    khs.addMataKuliah(mk2);
    khs.addMataKuliah(mk3);

    //create objek mahasiswa
    Mahasiswa mhs = new Mahasiswa("303040001", "John");

    //create objek transkrip nilai
    TranskripNilai transkrip = new TranskripNilai(mhs);
    transkrip.addKHS(khs);
    transkrip.hitungIPK();
    transkrip.display();
    }
}
```

Output :

NRP: 303040001, Nama: John

Tanggal Cetak: Sun Mar 24 19:21:55 ICT 2024

IPK: 2.3333333333333335

001 - Algoritma Pemorgraman 1 - A - 3

002 - Algoritma Pemorgraman 2 - BC - 3

003 - Pemrograman Berorientasi Objek - B – 3