program student\_grade;

uses crt;

const

maks\_mhs = 50; // Mahasiswa

maks\_mk = 10; // Mata Kuliah

type

// mata kuliah

dmk = record

kd\_mk, nm\_mk: string;

sks: integer;

end;

// mahasiswa

dmhs = record // record

nim, nama: string;

ipk: real;

end;

arr\_mk = array[1..maks\_mk] of dmk; // Mata Kuliah array of record

arr\_mhs = array[1..maks\_mhs] of dmhs; // Mahasiswa array of record

arr\_nilai = array[1..maks\_mhs, 1..maks\_mk] of integer; // matriks nilai

arr\_idx = array[1..maks\_mhs, 1..maks\_mk] of char; // matriks indeks

{ Kamus Global }

var

mahasiswa: arr\_mhs;

matakuliah: arr\_mk;

nilai: arr\_nilai;

indeks: arr\_idx;

// i, j: integer; // buat looping dan tabel

baris: integer; // buat nyimpan baris dari tabel mahasiswa dan matkul

jml\_mhs, jml\_mk: integer; // buat jumlah mahasiswa dan matkul

procedure jumlah\_data\_mhs(var jml\_mhs: integer);

{ I.S: User memasukkan banyaknya data (jml\_mhs) }

{ F.S: menghasilkan banyaknya data (jml\_mhs) }

begin

gotoxy(1, 1); write('Banyaknya Mahasiswa: '); readln(jml\_mhs);

// validasi

while (jml\_mhs < 1) or (jml\_mhs > maks\_mhs) do begin

gotoxy(1, 2); textcolor(red);

write('Banyaknya data Mahasiswa hanya antara 1-50!'); readln;

gotoxy(45, 2); clreol;

gotoxy(1, 2); clreol; textcolor(white);

gotoxy(22, 1); clreol; readln(jml\_mhs);

end;

end;

procedure jumlah\_data\_mk(var jml\_mk: integer);

{ I.S: User memasukkan banyaknya data (jml\_mk) }

{ F.S: menghasilkan banyaknya data (jml\_mk) }

begin

gotoxy(1, 2); write('Banyaknya Mata Kuliah: '); readln(jml\_mk);

// validasi

while (jml\_mk < 1) or (jml\_mk > maks\_mk) do begin

gotoxy(1, 3); textcolor(red);

write('Banyaknya data Mata Kuliah hanya antara 1-10!'); readln;

gotoxy(47, 2); clreol;

gotoxy(1, 3); clreol; textcolor(white);

gotoxy(24,2); clreol; readln(jml\_mk);

end;

gotoxy(1, 3); write('Tekan enter untuk melanjutkan!'); readln;

end;

{ Begin Mahasiswa }

procedure no\_mhs\_ke(i: integer);

begin

gotoxy(17, i + 4); write('| | | |');

gotoxy(21, i + 4); write(i);

end;

procedure isi\_mahasiswa(i: integer; var mahasiswa: arr\_mhs);

{ I.S: User memasukkan data tiap mahasiswa }

{ F.S: Menyimpan data mahasiswa }

begin

gotoxy(23, i + 4); readln(mahasiswa[i].nim); // Isi NIM

//validasi

while (length(mahasiswa[i].nim) <> 8) do begin

gotoxy(17, i + 5); textcolor(red); write('NIM hanya boleh 8 digit!');

readkey;

gotoxy(17, i + 5); clreol; // hapus keterangan error

gotoxy(23, i + 4); clreol; textcolor(white);

no\_mhs\_ke(i);

gotoxy(23, i + 4); readln(mahasiswa[i].nim); // Isi NIM

end;

gotoxy(33, i + 4); readln(mahasiswa[i].nama); // Isi Nama

end;

procedure tabel\_mahasiswa(jml\_mhs: integer; var mahasiswa: arr\_mhs);

{ I.S: Jumlah mahasiswa telah terdefinisi }

{ F.S: Menghasilkan data baru mahasiswa }

// procedure isi\_mahasiswa(i: integer); prototype

var i: integer;

begin

clrscr;

gotoxy(31, 1); // dibagi 2

write('DAFTAR MAHASISWA');

gotoxy(17, 2);

write('-------------------------------------------');

gotoxy(17, 3);

write('| No | NIM | Nama Mahasiswa |');

gotoxy(17, 4);

write('-------------------------------------------');

for i := 1 to jml\_mhs do begin

no\_mhs\_ke(i);

isi\_mahasiswa(i, mahasiswa);

end;

gotoxy(17, i + 5);

writeln('-------------------------------------------');

baris := baris + i + 6;

end;

{ End Mahasiswa }

{ Begin Mata Kuliah }

procedure isi\_matkul(i: integer; var matakuliah: arr\_mk);

{ I.S: User memasukkan data tiap mata kuliah }

{ F.S: Menyimpan data mata kuliah }

begin

gotoxy(23, baris + i + 4); readln(matakuliah[i].kd\_mk); // Isi Kode MK

gotoxy(42, baris + i + 4); readln(matakuliah[i].nm\_mk); // Isi Nama MK

gotoxy(63, baris + i + 4); readln(matakuliah[i].sks); // Isi SKS

end;

procedure tabel\_matkul(jml\_mk: integer; var matakuliah: arr\_mk);

{ I.S: Jumlah mata kuliah telah terdefinisi }

{ F.S: Menghasilkan data baru mata kuliah }

// procedure isi\_matkul; prototype

var i: integer;

begin

gotoxy(33, baris + 1); // dibagi 2

write('DAFTAR MATA KULIAH');

gotoxy(17, baris + 2);

write('--------------------------------------------------');

gotoxy(17, baris + 3);

write('| No | Kode Mata Kuliah | Nama Mata Kuliah | SKS |');

gotoxy(17, baris + 4);

write('--------------------------------------------------');

for i := 1 to jml\_mk do begin

// Tabel

gotoxy(17, baris + i + 4); write('| | | | |');

gotoxy(21, baris + i + 4); write(i);

isi\_matkul(i, matakuliah);

end;

gotoxy(17, baris + i + 5);

write('--------------------------------------------------');

gotoxy(17, baris + i + 6); write('Tekan enter untuk melanjutkan!'); readln;

end;

{ End Mata Kuliah }

{ Begin Perhitungan }

function idx(n: integer): char;

{ I.S.: (n) sudah terdefinisi }

{ F.S.: menghasilkan fungsi idx n }

begin

case (n) of

80..100: idx := 'A';

70..79: idx := 'B';

60..69: idx := 'C';

50..59: idx := 'D';

0..49: idx := 'E';

end;

end;

function bobot(idx\_mhs: char; sks: integer): real;

{ I.S.: (idx\_mhs) & (sks) sudah terdefinisi }

{ F.S.: menghasilkan fungsi bobot }

begin

case (idx\_mhs) of

'A': bobot := 4 \* sks;

'B': bobot := 3 \* sks;

'C': bobot := 2 \* sks;

'D': bobot := 1 \* sks;

'E': bobot := 0 \* sks;

end;

end;

{ End Perhitungan }

procedure isi\_nilai(var nilai: arr\_nilai);

{ I.S.: User mengisi data nilai }

{ F.S.: Menghasilkan nilai tiap mahasiswa }

var i, j: integer;

begin

for i := 1 to jml\_mhs do begin

textcolor(lightblue);

gotoxy(1, i + 5); write(mahasiswa[i].nim);

for j := 1 to jml\_mk do begin

textcolor(white);

gotoxy(j \* 10, i + 5); readln(nilai[i, j]);

//validasi

while(nilai[i,j] < 0) or (nilai[i,j] > 100) do

begin

gotoxy(j \* 10, i + 6); textcolor(red); write('Nilai hanya dari 0-100!');

readkey;

gotoxy(j \* 10 + 26, i + 6); clreol;

gotoxy(j \* 10, i + 6); clreol; textcolor(white);

gotoxy(j \* 10, i + 5); clreol; readln(nilai[i, j]);

end;

end;

end;

end;

procedure isi\_indeks(var indeks: arr\_idx);

{ I.S.: User mengisi data indeks }

{ F.S.: Menghasilkan indeks tiap mahasiswa }

var i, j: integer;

begin

for i := 1 to jml\_mhs do begin

for j := 1 to jml\_mk do begin

indeks[i, j] := idx(nilai[i, j]);

textcolor(red);

gotoxy(j \* 10, i + 5); clreol; delay(300); write(indeks[i, j]);

end;

end;

textcolor(white);

gotoxy(1, i + 6); write('Tekan enter untuk melanjutkan!'); readln;

end;

procedure tabel\_indeks\_nilai(jml\_mhs, jml\_mk: integer; var nilai: arr\_nilai; var indeks: arr\_idx);

{ I.S.: User memulai mengisi data nilai dan indeks }

{ F.S.: Menampilkan indeks tiap mahasiswa }

var i: integer;

begin

clrscr;

gotoxy(39, 1); // dibagi 2

write('Pengisian Nilai Mahasiswa');

gotoxy(39, 2); write('-------------------------');

gotoxy(1, 5); write('NIM');

gotoxy(10, 4); write('Kode Mata Kuliah');

for i := 1 to jml\_mk do begin

textcolor(lightblue);

gotoxy(i \* 10, 5); write(upcase(matakuliah[i].kd\_mk));

end;

isi\_nilai(nilai); // prosedur

isi\_indeks(indeks);

writeln;

end;

procedure tampil\_data(jml\_mhs, jml\_mk: integer; mahasiswa: arr\_mhs; matakuliah: arr\_mk; nilai: arr\_nilai; indeks: arr\_idx); // khs

var

total\_sks, total\_bobot: real;

i, j: integer;

begin

clrscr;

baris := 0;

gotoxy(25, 1); write('HASIL STUDI MAHASISWA TEKNIK INFORMATIKA UNIKOM SEBANYAK ', jml\_mhs, ' MAHASISWA');

gotoxy(1, 2); write('========================================================================================================================');

for i := 1 to jml\_mhs do begin

total\_bobot := 0;

total\_sks := 0; // reset for each student

if (i > 1) then baris := baris - i; // line-length for each student table

gotoxy(1, baris + i + 4);

write('-----------------------------------------------------Mahasiswa Ke-', i, '-----------------------------------------------------');

gotoxy(1, baris + i + 5); write('NIM : ', mahasiswa[i].nim);

gotoxy(1, baris + i + 6); write('Nama : ', mahasiswa[i].nama);

gotoxy(1, baris + i + 7); write('-----------------------------------------------------------');

gotoxy(1, baris + i + 8); write('| No | Kode Mata Kuliah | Nama Mata Kuliah | SKS | Indeks |');

gotoxy(1, baris + i + 9); write('-----------------------------------------------------------');

baris := baris + i + 9;

for j := 1 to jml\_mk do begin

total\_sks := total\_sks + matakuliah[j].sks;

total\_bobot := total\_bobot + (bobot(indeks[i, j], matakuliah[j].sks));

gotoxy(1, baris + j); write('| | | | | |');

gotoxy(3, baris + j); write(j);

gotoxy(7, baris + j); write(upcase(matakuliah[j].kd\_mk));

gotoxy(27, baris + j); write(upcase(matakuliah[j].nm\_mk));

gotoxy(46, baris + j); write(matakuliah[j].sks);

gotoxy(52, baris + j); write(indeks[i, j]);

end;

mahasiswa[i].ipk := total\_bobot / total\_sks;

gotoxy(1, baris + j + 1); write('-----------------------------------------------------------');

gotoxy(1, baris + j + 2); writeln('IPK : ', mahasiswa[i].ipk:0:1);

baris := baris + j;

end;

end;

{ Algoritma Utama }

begin

// window(1, 1, 100, 100);

clrscr;

textcolor(white);

// masukkan jumlah

jumlah\_data\_mhs(jml\_mhs);

jumlah\_data\_mk(jml\_mk);

// tampilkan tabel matkul dan mahasiswa

tabel\_mahasiswa(jml\_mhs, mahasiswa);

tabel\_matkul(jml\_mk, matakuliah);

// isi nilai dan tampilkan indeks tiap mahasiswa

tabel\_indeks\_nilai(jml\_mhs, jml\_mk, nilai, indeks);

// tampilkan semuanya

tampil\_data(jml\_mhs, jml\_mk, mahasiswa, matakuliah, nilai, indeks);

readln;

end.

**Kontribusi:**

* **Hatta Pramulia:** Listing Program, Screenshot, Perbaikan validasi (jumlah mahasiswa, jumlah matkul, dan digit nim hanya 8 digit)
* **Ammar Riefqul Abrar:** Algoritma Tulis
* **Mochamad Iqbal Dwi Cahyo:** Tampilan seluruh tabel dan prosedur
* **Rafli Rachmawandi:** Fungsi IPK, perbaikan validasi (nilai 1-100 saja)
* **Adhitya Junian Dasuki:** Fungsi IDX, perbaikan penamaan deskriptif untuk variabel, prosedur dan fungsi (lokal dan global variabel)