

## GTA ASSIGNMENT – 1

**Name:** RAHUL VARMA

**Roll No:** S20200010212

My assumptions and constraints:

### **SOFT:**

- Number of Faculty (input) ie.. 12
- Number of Courses (input) ie.. 12
- Number of Students (input) ie.. 180
- Class Rooms (input) ie.. 6

### **Batches**

- Minimum number of Classes per Course for week is credits: (input) ie.. 4.
- Courses for UG2: ADSA, OOPS, OS, DBMS.
- Courses for UG3: CC, DC, GTA, ML.
- Courses for UG4: VAR, DIP, BI, DSD.

### HARD:

- IF FACULTY IS LESS THAN REQUIRED GIVES ERROR MESSAGE
- IF CLASSES ARE LESS GIVES ERROR MESSAGE
- FOR UG2 --> 101, 102.
- FOR UG3 --> 103, 104.
- FOR UG4 --> 105, 106.
- Faculty Availability.
- Less classes are preferable on last period of the class.

INPUT GIVEN IS ALSO PRINTED: (Sample Input is given in readme and in this file also at last).

```
Batch 0:ug2
Total Subjects:4
Room:
Subjects:
  Subject 0:ADSA
    Teacher:Rahul
    Credit:4
  Subject 1:OOP
    Teacher:Varma
    Credit:4
  Subject 2:OS
    Teacher:Sai
    Credit:4
  Subject 3:DBMS
    Teacher:Ashok
    Credit:4
```

```
Batch 1:ug3
Total Subjects:4
Room:
Subjects:
    Subject 0:CC
        Teacher:Saketh
        Credit:4
    Subject 1:DC
        Teacher:Darshak
        Credit:4
    Subject 2:GTA
        Teacher:Kasyap
        Credit:4
    Subject 3:ML
        Teacher:Vinay
        Credit:4
```

```
Batch 2:ug4
Total Subjects:4
Room:
Subjects:
    Subject 0:VAR
        Teacher:Sriram
        Credit:4
    Subject 1:DIP
        Teacher:Prabhash
        Credit:4
    Subject 2:BI
        Teacher:odelusir
        Credit:4
    Subject 3:DSD
        Teacher:ragavendrasir
        Credit:4Edge between ADSA and OOP
```

Edge between ADSA and OS  
Edge between ADSA and DBMS  
Edge between OOP and ADSA  
Edge between OOP and OS  
Edge between OOP and DBMS  
Edge between OS and ADSA  
Edge between OS and OOP  
Edge between OS and DBMS  
Edge between DBMS and ADSA  
Edge between DBMS and OOP  
Edge between DBMS and OS  
Edge between CC and DC  
Edge between CC and GTA  
Edge between CC and ML  
Edge between DC and CC  
Edge between DC and GTA  
Edge between DC and ML

Edge between GTA and CC  
Edge between GTA and DC  
Edge between GTA and ML  
Edge between ML and CC  
Edge between ML and DC  
Edge between ML and GTA  
Edge between VAR and DIP  
Edge between VAR and BI  
Edge between VAR and DSD  
Edge between DIP and VAR  
Edge between DIP and BI  
Edge between DIP and DSD

Edge between DIP and BI  
Edge between DIP and DSD  
Edge between BI and VAR  
Edge between BI and DIP  
Edge between BI and DSD  
Edge between DSD and VAR  
Edge between DSD and DIP  
Edge between DSD and BI

OUTPUT:

Time Table for UG2:

| -----Time Table----- |               |               |               |               |               |
|----------------------|---------------|---------------|---------------|---------------|---------------|
|                      | Day 1         | Day 2         | Day 3         | Day 4         | Day 5         |
|                      | -----ug2----- |               |               |               |               |
| Period 1             | ADSA<br>Rahul | ADSA<br>Rahul | ADSA<br>Rahul | ADSA<br>Rahul | OOP<br>Varma  |
| Period 2             | Break         | Break         | Break         | Break         | Break         |
| Period 3             | OOP<br>Varma  | OOP<br>Varma  | OOP<br>Varma  | OS<br>Sai     | OS<br>Sai     |
| Period 4             | OS<br>Sai     | OS<br>Sai     | DBMS<br>Ashok | DBMS<br>Ashok | DBMS<br>Ashok |
| Period 5             | DBMS<br>Ashok | --<br>--      | --<br>--      | --<br>--      | --<br>--      |
| -----                |               |               |               |               |               |

## Time Table for UG3:

|          | Day 1         | Day 2<br>ug3  | Day 3         | Day 4         | Day 5         |
|----------|---------------|---------------|---------------|---------------|---------------|
| Period 1 | CC<br>Saketh  | CC<br>Saketh  | CC<br>Saketh  | CC<br>Saketh  | DC<br>Darshak |
| Period 2 | Break         | Break         | Break         | Break         | Break         |
| Period 3 | DC<br>Darshak | DC<br>Darshak | DC<br>Darshak | GTA<br>Kasyap | GTA<br>Kasyap |
| Period 4 | GTA<br>Kasyap | GTA<br>Kasyap | ML<br>Vinay   | ML<br>Vinay   | ML<br>Vinay   |

## Time Table for UG4:

|          | Day 1                | Day 2<br>ug4    | Day 3                | Day 4                | Day 5                |
|----------|----------------------|-----------------|----------------------|----------------------|----------------------|
| Period 1 | VAR<br>Sriram        | VAR<br>Sriram   | VAR<br>Sriram        | VAR<br>Sriram        | DIP<br>Prabhash      |
| Period 2 | Break                | Break           | Break                | Break                | Break                |
| Period 3 | DIP<br>Prabhash      | DIP<br>Prabhash | DIP<br>Prabhash      | BI<br>odelusir       | BI<br>odelusir       |
| Period 4 | BI<br>odelusir       | BI<br>odelusir  | DSD<br>ragavendrasir | DSD<br>ragavendrasir | DSD<br>ragavendrasir |
| Period 5 | DSD<br>ragavendrasir | --<br>--        | --<br>--             | --<br>--             | --<br>--             |

## Graph:

Graph of subjects and teachers:

```
ug2 --> ADSA --> Rahul, OOP --> Varma, OS --> Sai, DBMS --> Ashok,  
ug3 --> CC --> Saketh, DC --> Darshak, GTA --> Kasyap, ML --> Vinay,  
ug4 --> VAR --> Sriram, DIP --> Prabhash, BI --> odelusir, DSD --> ragavendrasir,
```

Graph of subjects and rooms:

```
ug2 --> ADSA --> , OOP --> , OS --> , DBMS --> ,  
ug3 --> CC --> , DC --> , GTA --> , ML --> ,  
ug4 --> VAR --> , DIP --> , BI --> , DSD --> ,
```

Graph of Batches and Teachers:

```
ug2 --> Rahul, Varma, Sai, Ashok,  
ug3 --> Saketh, Darshak, Kasyap, Vinay,  
ug4 --> Sriram, Prabhash, odelusir, ragavendrasir,
```

Graph of subjects and teachers:

```
ug2 --> ADSA --> Rahul, OOP --> Varma, OS --> Sai, DBMS --> Ashok,  
ug3 --> CC --> Saketh, DC --> Darshak, GTA --> Kasyap, ML --> Vinay,  
ug4 --> VAR --> Sriram, DIP --> Prabhash, BI --> odelusir, DSD --> ragavendrasir,
```



## GTA - Assign - 1

### Time tabling problem

#### First Assumptions

(a) No. of courses = 12

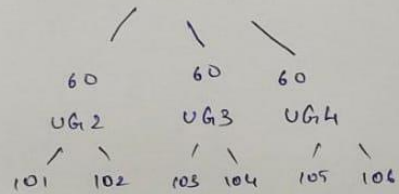
| <u>UG2</u> | <u>UG3</u> | <u>UG4</u> |
|------------|------------|------------|
| ASDA       | CC         | VAR        |
| OOP        | DC         | DIP        |
| OS         | GTA        | BI         |
| DBMS       | ML         | DSD        |

(b) Time slots ( $\tau$ ) = 36

(c) set of Rooms

101, 102, 103, 104, 105, 106

(d)  $M = 180$



4 subjects for each courses.

#### constraints

→ no. of classes for subject = credits  
Input taken credits.

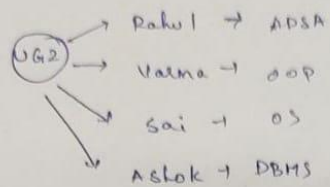
→ class all scheduled as early as possible.

→ Rooms two per each

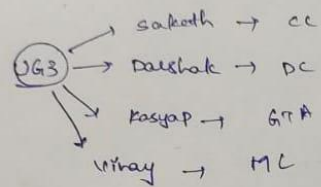
→

Graph-I

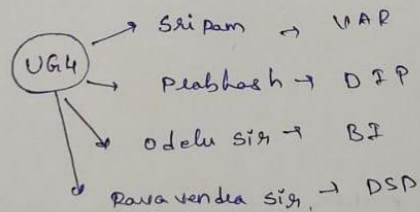
Batch/class  $\rightarrow$  Faculty-Name



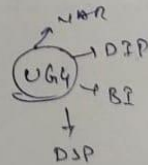
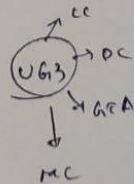
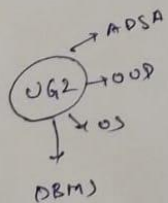
We should map different colours for each teacher.



Here also different colours for each teacher.



Graph-II



## SAMPLE INPUT:

5  
5  
3  
12  
6  
  
101  
102  
103  
104  
105  
106  
  
Rahul  
Varma  
Sai  
Ashok  
Saketh  
Darshak  
Kasyap  
Vinay  
Sriram  
Prabhash  
odelusir  
ragavendrasir  
  
ug2  
  
4  
ADSA  
4  
0  
OOP  
4  
1  
OS  
4  
2  
DBMS  
4  
3  
101  
  
ug3  
  
4  
CC

4  
4  
DC  
4  
5  
GTA  
4  
6  
ML  
4  
7  
103  
  
ug4  
  
4  
VAR  
4  
8  
DIP  
4  
9  
BI  
4  
10  
DSD  
4  
11  
105