**Clinics Arrangement rules**

**General Clinic Operating Hours & Structure:**

* Clinics operate **14 hours daily** from **8:00 AM to 10:00 PM**, **Saturday to Thursday**.
* The scheduling system ensures **no overlapping shifts** within the same clinic.
* Clinics follow an **hourly-based** scheduling system.

**2. Full-Time Doctor Allocation:**

* **Full-time doctors work 8-hours/ shifts per day**.
* They have the following shift options:
* **Stright shift** 
  + **Morning Shift:** 8:00 AM – 4:00 PM or 9:00 AM to 5:00PM (Sat–Wed)
  + **Afternoon Shift:** 2:00 PM – 10:00 PM or 1:00PM to 9:00PM (Sat–Wed)
* **Split Shift:** 
  + - Morning: 8:00 AM-12:00 PM / 9:00 AM-1:00 PM
    - Afternoon: 5:00 PM-9:00 PM / 6:00 PM-10:00 PM
  + **Thursday Exception:**
    - Morning: 8:00 AM – 12:00 PM / 9:00 AM – 1:00 PM
    - Afternoon: 2:00 PM – 6:00 PM or 6:00PM- 10:00PM
* **Clinic Capacity for Full-Time Doctors:**
  + **One full-time doctor per shift** (morning or afternoon) in the same clinic
  + Alternatively, **one full-time doctor and one half-duty full-time doctor (4 hours each)**.
  + **Maximum coverage per day:** One full-time doctor (morning) + 4-hour afternoon shift, ensuring **14-hour total coverage**.

**3. Part-Time Doctor Allocation:**

* **Standard working time for part-time doctors = 20 hours per week (or less).**
* **They can only work after 2:00 PM.**
* Their available shifts:
  + **2:00 PM – 6:00 PM (4 hours)**
  + **6:00 PM – 10:00 PM (4 hours)**
* **Maximum part-time doctors per clinic per day:**
  + **One part-time doctor per shift.**
  + **Two part-time doctors from 2:00 PM to 6:00 PM, and 6:00PM- to 10:00PM**

**4. Criteria for Accommodating a New Doctor:**

* A new doctor can only be accommodated if a **free time slot** exists within the **14-hour clinic operation**.
* A clinic is considered **full** if:
  + **One full-time doctor** is scheduled for the **morning shift**, and **one part-time doctor** is scheduled for the **afternoon shift**.
  + **A part-time doctor is scheduled based on their 20-hour weekly contract.**

**5. System Implementation & Scheduling Optimization:**

* The system should **automatically allocate doctors** based on:
  + **Available time slots.**
  + **No overlapping shifts.**
  + **Maximizing clinic efficiency while ensuring compliance** with hospital policies.
* Scheduling should be **optimized for maximum utilization** of available clinic hours.

**Key Takeaways:**

1. **Clinics run for 14 hours daily** with strict shift allocations.
2. **Full-time doctors** work 8-hour shifts, and **part-time doctors** work after 2 PM for up to 20 hours per week.
3. **Only one full-time doctor per shift**, but a **half-duty full-time doctor (4 hours) can be accommodated** if needed. and the other remining 4 hours can be accommodated in other vacant clinic if their availability
4. **A maximum of two part-time doctors per clinic per day**.
5. The scheduling system must ensure **no overlapping in doctors’ shifts** either part time of full time

**Use case scenario to be template**

Clinic A has a 3 vacant physical clinic

The occupancy and accommodation for the maximum time utilization can be as follow: -

Input: clinic running hours are from 8:00AM- 10:00PM

Clinic Number are 3 physical clinics

* **Scenario No.1**
* **Clinic No.1**: can accommodate one full-time doctor 8 hours from 8:00AM -4PM and one part doctor from 4:00PM to 8:00PM or from 5:00PM to 9:00PM according to his contractual hours
* **Clinic No. 2**: can accommodate one full-time doctor 8 hours from 8:00AM -4PM and one part doctor from 4:00PM to 8:00PM or from 5:00PM to 9:00PM Accommodation to his contractual hours according
* **Clinic No**.3: can accommodate one full-time doctor 8 hours from 8:00AM -4PM and one part doctor from 4:00PM to 8:00PM or from 5:00PM to 9:00PM according to his contractual hours
* **Scenario No.2**
* **Clinic No.1:** can accommodate one full-time doctor 8 hours from 8:00AM -4PM and one part doctor from 4:00PM to 8:00PM or from 5:00PM to 9:00PM according to his contractual hours
* **Clinic No. 2:** can accommodate one full-time on split shift from 8:00AM-12:00PM then from 6:00PM-10PM and one part-time doctor from 2:00PM-6:00PM
* **Clinic No.3:** can accommodate one full-time on split shift from 8:00AM-12:00PM then from 6:00PM-10PM and one part-time doctor from 2:00PM-6:00PM.
* **Scenario No.3**
* **Clinic No.1:** can accommodate one full time doctor from8:00AM-12:00PM and then from 6:00PM-10:00PM and one full time doctor from 1:00OM to 5:00PM then complete the shift in **clinic No.2** from 5:00PM to 9:00PM
* **Clinic No.2:** can accommodate one full time doctor from8:00AM-12:00PM and then from 6:00PM-10:00PM and one full time doctor from 1:00OM to 5:00PM then complete the shift in clinic No.3 from 5:00PM to 9:00PM
* **Clinic No.3:** can accommodate one full-time doctor 8 hours from 8:00AM -4PM and one part doctor from 4:00PM to 8:00PM or from 5:00PM to 9:00PM according to his contractual hours
* **Scenario No.4**
* **Clinic No.1:** can accommodate one full-time doctor 8 hours from 8:00AM -12:00PM, then from 6:00PM-10:00PM and one part doctor from 2:00PM to 6:00PM
* **Clinic No. 2** can accommodate one full-time doctor 8 hours from 8:00AM -12:00PM, then from 6:00PM-10:00PM and one part doctor from 2:00PM to 6:00PM
* **Clinic No.3:** can accommodate one full-time doctor 8 hours from 8:00AM -12:00PM, then from 6:00PM-10:00PM and one part doctor from 2:00PM to 6:00PM

**Key Clinic Capacity Rules Recap**

1. **Each clinic can accommodate:**
   * **One full-time doctor working 8 hours per day.**
   * **A remaining 6-hour vacant slot (4:00 PM - 10:00 PM) after a full-time doctor shift.**
   * This **vacant slot (4:00 PM - 10:00 PM) can be filled by**:  
     ✅ **One part-time doctor (4 hours shift: 4:00 PM - 8:00 PM or 4:00PM to 9:00PM or 5:00PM to 9:00PM or 6:00 PM - 10:00 PM)**  
     ✅ **Or a half-shift full-time doctor (4 hours from 4:00 PM - 8:00 PM) or 5:00PM-9:00PM or 6:00PM.**
2. **Full-Time Doctor Allocation**
   * A **full-time doctor can either work**:  
     ✅ **A straight 8-hour shift (8:00 AM - 4:00 PM or 9:00 AM - 5:00 PM)**  
     ✅ **A split shift (8:00 AM - 12:00 PM and (6:00 PM - 10:00 PM) or (9:00AM-1:00PM) or ( 5:00PM-9:00PM) or 6:00PM-10:00PM).**
   * A **half-shift (4 hours) full-time doctor can cover 5:00 PM - 9:00 PM**, or 6:00PM -10:00PM
3. **Part-Time Doctor Allocation**
   * Part-time doctors **can only work after 2:00 PM**.
   * **They work a 4-hour shift:** ✅ **2:00 PM - 6:00 PM**  
     ✅ **6:00 PM - 10:00 PM**
   * **Max 2 part-time doctors per clinic per day, in can the full time doctor will work only morning shift from 8:00AM-12:00PM or 9:00AM-1:00PM in the same clinic this condition apply**

**Full-Time Doctor Allocation (No Overlapping)**

Each clinic can accommodate:

1. **One full-time doctor on a straight shift** (8:00 AM – 4:00 PM or 9:00 AM – 5:00 PM)  
   **OR**
2. **One full-time doctor on a split shift** (Morning: 8:00 AM – 12:00 PM or 9:00 AM – 1:00 PM + Evening: 6:00 PM – 10:00 PM)

* Since there are **11 clinics**, we can accommodate:
  + **11 full-time doctors on a straight shift**  
    **OR**
  + **11 full-time doctors on a split shift**

**Total full-time doctors: 11 per day**

**Part-Time Doctor Allocation (No Overlapping)**

* **Part-time doctors can only work after 2:00 PM.**
* A **clinic is considered full** when a **full-time doctor is already covering from 8:00AM to 4:00PM or from 9:00am to 5:00PM and the part time covering from 4:00PM to 9:00PM or from 5:00PM to 9:00PM**
* A clinic will be also considered as full when a full time is already covering on split shift from 8:00Am to 12:00PM and part time doctor cover from 2:00PM to 6:00PM and from 6:00PM to 10PM will be full with the same one full time doctor
  + Each clinic can accommodate **one part-time doctor from 4:00 PM – 10:00**