# ISM 6205 Project 3 Physical Database Design Fall 2019

Name:

Patient(PatId, PatName, PatStreet, PatCity, PatSt, Policy)

Appointment(AppointId, AppointDate, PatId, AppointStatus, AppointCharge)

PrescriptionOrder(POId, ApptId, PharmacistId, Amount)

Pharmacist(PhamacistId, PharmacistName, PharmacistContact)

Assume sequential access time is 1 ms and random access time is 10 ms. The size of a block is 8K. Assume a predominantly transaction-based environment. If the scan time is less than 0.25 seconds (i.e., 250 ms), then you don’t need to index *any* field since the query time is limited.

Assume the following number of records and size of a record in each file of the active database:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Table | Records | Length | Bf | No. Blocks | Scan Time (s) |
| Patient: | 1,000,000; | 200 bytes | 40 | 25000 | 25 |
| Appointment: | 10,000,000; | 80 bytes | 100 | 100000 | 100 |
| PrescriptionOrder: | 40,000,000; | 40 bytes | 200 | 200000 | 200 |
| Pharmacist: | 1,000; | 80 bytes | 100 | 10 | 0.01 |

The following are the distinct values for some of the attributes:

PatName: 100,000

Answer the following (and show the calculations):

1) Consider access through the following four attributes in a single-table query with restrict condition of type *attribute = value*:

Show calculations for each field and decide if you need to have an index on each of the following four fields.

|  |  |  |  |
| --- | --- | --- | --- |
| Field | No. of Records Touched (n) | Index Time | Index (I)  or Scan (S) |
| PrescriptionOrder.ApptId | 40,000,000/10,000,000=4 | 60ms | I |
| PrescriptionOrder.PharmacistId | Small table | N/A | S |
| PharmacistName | 40,000,000/1,000=40,000 | 400s | S |
| Patname | 1,00,000/100,000 = 10 | 120ms | I |