# CSC430/530 – Database Management Systems

Assignment #5 – Indexing Structures

Consider a disk with a block size **B = 1024 bytes** and a block pointer **P = 12 bytes**. Suppose file has **r = 69632**

EMPLOYEE records of fixed length. Each record has following attributes:

* First\_name (*60 bytes*);
* SSN (*18 bytes*);
* Dnumber (*18 bytes*);
* Home\_address (*80 bytes*);
* Contact\_phone (*20 bytes*);
* BDate (*16 bytes*);
* Gender (*2 byte*);
* Job\_code (*8 bytes*);
* Salary (*8 bytes*);
* Additional *2 bytes* are used as a deletion marker.

1. Assuming an unspanned organization, calculate following.

**\*To get full points, please, show all formulas and calculations.**

* + Record size **R** (in bytes).

**R = *60 + 18 + 18 + 80 + 20 + 16 + 2 + 8 + 8 + 2 = 232 bytes***

* + Blocking factor **bfr.**

**bfr = = = 4 records/block**

* + Number of file blocks **b**.

**b = = = 17,408 blocks**

1. Assuming file is ordered by key attribute **Ssn** and primary index is constructed on this key attribute, calculate the following.

**\*To get full points, please show all formulas and calculations.**

* + Index blocking factor **bfri**.

**Ri = SSN\_Size + Pointer\_Size = 18 bytes + 12 bytes = 30 bytes**

**bfri = = = 34**

* + Total number of indexes **ri** and number of index blocks **bi**. **ri = one for each data file block = b = 17,408 indexes**

**bi = = Ri / bfr = 512 blocks**

* + Total number of accesses needed to search for a record using primary index. **ceil(log2(bi)) + 1 = ceil(log2(512)) + 1 = 10**