Workshop Exercise 1

1) Explain why Hard Disk is the most common storage media for databases at present

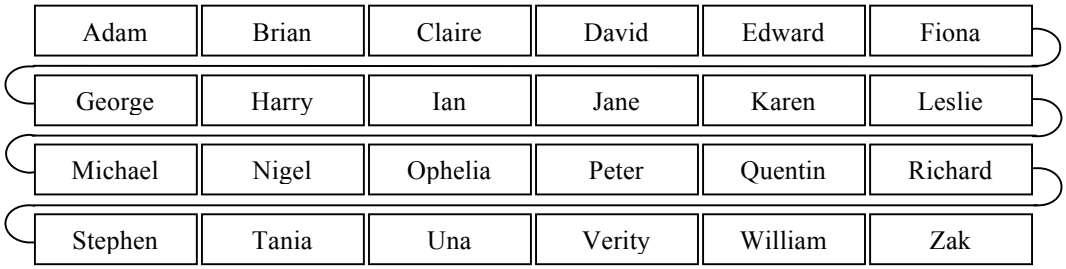
2) What are the advantages and disadvantages of spanned records?

3) Suppose the block size is 4096 bytes, and records are of a fixed length of 90 bytes. What is the blocking factor? How many blocks do we need to store a file of 100,000 records using unspanned organszation?

4) What are the major advantages and disadvantages of each of the following file organisations?:

   a) heap file organisation
   b) ordered file organisation
   c) hash file organisation

5) Consider the following diagram where each rectangle represents a block of records in an ordered file (from left to right and top to bottom) and the name in each block is the ordering key value of the first record in the block:



   Explain using diagrams how a binary search on the file would look for the Block containing the record with the key value 'Sarah'

6) Consider the following hashed file organisation (only the primary key shown), using a bucket size of 3. The hashing function used is the simple division / remainder method (sometimes called modulo divide); in this case using 7 as the prime number divisor. Any record that will not fit into its home address will be placed to an overflow bucket. Each address is capable of holding three keys

   Show the effect of the following **sequence of operations** on this file using **open addressing** (and then repeat the question using **chaining**):

   i) insert record with hash key 6

ii) then insert record with hash key 55
iii) then insert record with hash key 77
iv) then insert record with hash key 143
v) then insert record with hash key 174
vi) then insert record with hash key 13

Bucket:

00	**28**	**14**	**35**
01	**22**	**43**	
02	**149**	**2**	
03	**10**	**3**	**117**
04	**4**		
05			
06	**27**		

What is the average number of block accesses to read a record before and after the insertions?