**Stevie Parris**

**Problems to be turned in**:

1. ***(10 points)*** Suppose you are keeping track of U.S. Senators in a database. In the database you have the State they represent, their party allegiance, the number of terms they've served, and records of how each Senator has voted (yea, nay, or abstain) on issue bill put before the Senate this year. Identify each of the following as an OLTP, a Query, a Batch Process, a Report, or Data Analysis. If it seems to you that more than one option applies (for example, a query that is also a report), write down both answers and give justification for each.
   1. Finding out who the Senators from your home state are.
      * Query
   2. Creating name tags for all the Senators with their name, state, and party allegiance.
      * Report
   3. Changing a Senator's party affiliation.
      * OLTP
   4. Determining how many votes a particular Senator has missed.
      * Query
   5. Using the vote record for a particular bill to decide if the bill has been passed.
      * Data Analysis
   6. Creating a pie chart to depict the fraction of Democrats, Republicans, and Independents in the Senate.
      * Data analysis
   7. Determining if a particular Senator did not vote with the rest of his/her party on a given bill.
      * Data Analysis
   8. Printing a list of Republican Senators, starting with the one with the most seniority, and ending with those elected in the last election.
      * Report
   9. Removing a Senator from the database when (s)he spontaneously retires after a scurrilous scandal.
      * OLTP
   10. Printing thank you letters for every Senator that supported federal funding for student scholarships.
       * Report
2. ***(6 points)*** : Consider a database used to maintain information about secure online transactions, such as used by *amazon.com*. For each of the following relationships, describe as one-to-one, one-to-many, or many-to-many, and explain your answers.
   1. A list of items ordered by a particular customer.
      * one-to-many – one customer, many items
   2. Customers who have purchased books from the *Harry Potter* series.
      * Many-to-many – many customers, many books
   3. A customer's preferred method of payment.
      * one-to-one, one customer, one method of payment
   4. Items on a customer's wish list.
      * One-to-many, one customer, many items on wishlist
   5. A customer's email address.
      * One-to-one, one customer, one email address
   6. Customer reviews for the 5th edition of a textbook.
      * One-to-many, one textbook, many customer reviews
3. ***(4 points)*** : The *YouTube* website evidently maintains a database containing BLOB's, particularly *videos*. Evidence that there is an underlying database, rather than simply being a website that includes links to videos, is that the user can make queries and primary key values may be found in the results). Find two more websites providing access to databases containing BLOB's, one each for *audio* and *images*. Show example queries and determine the primary keys returned in the results.
   1. [***www***.google.com](http://www.google.com)
   2. [***www***.metacafe.com](http://www.metacafe.com)
4. ***(10 points)*** **Blown to Bits**: Read the first part of Chapter 2, pp. 19-35. Consider the following instances cited by the authors, and for each, describe the tables of information involved, what fields were related to each other, and what primary key helped identify the hapless victim of cyber sleuthing:
   1. the person who posted *Harry Potter and the Deathly Hallows* prior to its publication date
      * Camera settings
        1. shutter speed, aperture, compression
      * date and time
      * Camera Information
        1. make, model, orientation
   2. the mayor of Cambridge, whose medical records were revealed

* ***(20 points)***Today's marketplace features several models of *programmable sewing machines*, operated by embedded computing devices. (You may need to research this if you are not familiar with these.) For such a device give examples of:
  1. Input
     + User interface, pressing buttons
  2. Storage
     + Holds onto patterns to produce
  3. Mathematical Calculations
     + Calculating the number of strands and keeping track of variations
  4. Logic (Comparing Values)
     + It uses logic to tell whether or not a thread has been passed through the machine, or whether it has already been used.
  5. Retrieval
     + It retrieves the patterns from the machine memory, or from the application on the computer.
  6. Output
     + It outputs the information in the form of sewn fabric.
  7. Stored Programs (pre-programmed/built-in programs)
     + The sewing machine stores programs in the actual printing hardware language. It also usually has a number of pre-installed patterns that can be installed.