

**CSE/INFO 100 Fluency with Information Technology**  
**Winter 2006**  
**Exam Review Questions ANSWER SHEET**

The final exam will be cumulative! Please also study previous midterm reviews and exams and other material from the beginning of the course. For instance:

**Six Steps in the Debugging Process (pg 199 of book)**

- 1) Make sure that you can reproduce the error
- 2) Determine exactly what the problem is
- 3) Eliminate “obvious” causes
- 4) Divide the process, separating out the parts that work from the part that doesn’t
- 5) When you reach a dead end, reassess your information, asking where you may be making wrong assumptions or conclusions, then step through the process again
- 6) As you work through the process from start to finish, make predictions about what should happen and verify that your predictions are fulfilled

The rest of this review will only cover material from the last midterm.

***Chapter 12: Social Implications of IT***

**1 What is accessibility, in the context of IT?**

The degree to which technology is usable by people with disabilities.

**2 What are some things you can do to increase the accessibility of your webpage?**

Use the “alt” attribute in your HTML image tags. Follow web standards. Structure your document. Try not to use large amounts of text. Make sure your webpage doesn’t depend on stylistic elements like colors, fonts and layout to convey content information. Check the W3C Accessibility Checklist: <http://www.w3.org/TR/WAI-WEBCONTENT/full-checklist.html>

**3 Which of the following aren't considered intellectual property?**

- a DVD
- a design for a new car
- a pencil
- a movie
- a description of a brand new algorithm which will break RSA encryption in logarithmic time
- a textbook

Pencils are not IP. DVDs and textbooks are not IP, though the information contained within them are.

**4 What is fair use? Give 3 examples of fair use of a copyrighted work.**

Fair use describes the general protection provided by the government that

allows people to draw from someone else's copyrighted intellectual property. It's designed to allow certain creative work that wouldn't be possible otherwise.

Examples:

- a. Parody or satire (e.g. a spoof of Star Wars on TV)
- b. Educational purposes (e.g. using an image from the Web in a PowerPoint presentation for class)
- c. Review or criticism (e.g. writing a review of the FIT 100 textbook and including short quotations from the book)

### **Chapter 13: The Basics of Spreadsheets**

- 5 **G\$3 stands for**
- a) relative column, relative row
  - b) absolute column, relative row
  - c) relative column, absolute row
  - d) absolute column, absolute row
- c) relative column, absolute row
- 6 **Chris has the CIA demographic data in a spreadsheet, and ranks (sorts) by the population column. As soon as the sort is complete, Chris notices that only the population column has changed. What error has Chris made?**

Chris sorted only the column, forgetting to sort all columns based on the population column, i.e. the rows were not kept together. As a result Chris lost the connection between the country (and its other data) and its population.

- 7 **Say you have the following Excel spreadsheet.**

	A	B	C	D	E	F
1	Money earned each month from part-time job					
2		January	February	March		
3	Sue	500	500	360		
4	Joe	600	700	900		
5						
6						
7						
8						
9						

**Give the formulas you would need to do each of the following. Write out EXACTLY and COMPLETELY what you would need to type into the result cell.**

- a) the sum amount earned by Sue and Joe together in the month of January

**b) the total amount earned by Sue for the three months (use the built-in excel function for sum, don't use +)**

**c) the formula to display the max amount Joe was ever paid in a month**

**d) the formula to display the word "Joe" if Joe earned more than Sue in February, and "Sue" in all other cases.**

a) =B3+B4

b) =SUM(B3:D3)

c) =MAX(B4:D4)

d) =IF(C4>C3,"Joe","Sue")

## ***Chapter 14 & 15: Database Concepts & Queries***

**8 What is a database record?**

Answer: A row in a database table, a tuple of information

**9 In a database, Rows are to Attributes as Records are to**

**a) Fields**

**b) Captions**

**c) Entities**

**d) Keys**

(a) Fields

**10 What are 1-to-1, 1-to-many, and many-to-many relationships? Give an example of each.**

1-to-1 relationships are when one entity in a table is related to and related by exactly only one entity in another table. An example would be a person and his/her social security number. We can only have one SSN and an SSN only describes one person. Thus, it is 1-to-1.

1-to-many relationships are when one entity in a table can be related to several entities in another table. In reverse, several entities in the second table are related to only one entity in the first table, and only one. An example would be how a mother can have many biological children, but each child can only have one biological mother.

Many-to-many relationships are what we expect, where many entries in one table relate to many entities in another, and vice versa. For instance, a single newspaper may have multiple people subscribing to it, but the subscribers themselves might also be subscribed to multiple newspapers.

**11 Specify the types of relationship for these pairs of entities:**

**Capital—State**

**City—State**

**Niece—Uncle**

**Recipe—Ingredient**

**Kitten—Mother**

Capital--State (one to one)

City--State (many to one)

Niece--Uncle (many to many)

Recipe--Ingredient (many to many)

Kitten--Mother (many to one)

- 12 **One of the primary benefits of a database is that it gives us the tools to eliminate redundancy. What is redundancy and why do we want to minimize it? How do we do this in a relational database?**  
Redundancy is the repetition of data whenever it is mentioned. So for example if we were storing what school college students attend, and we included attributes to describe the college (including college size, college location, etc) for every student that went to UW, we would have the redundant data due to the college fields. This is because for every student that attends UW, we repeat the same information about UW over again! To solve this in databases, we just use a reference, so the student table will contain a reference to an entry in another table which contains info about UW. This way we only need to keep a single copy of the UW information and don't need to repeat it. We want to do this because it increases efficiency of our database (think about if we wanted to change the student population number of UW! We'd have to change every single entry!) as well as the storage/memory usage of our database.
- 13 **What does the union operation do?**  
It creates a new table by combining two tables with same attributes.
- 14 **Convert the following SQL into English:**
- ```
SELECT UWStudent.Name, UWStudent.StudentID,  
Fit100Student.Exam1Grade  
FROM (UWStudent INNER JOIN Fit100Students ON  
UWStudent.StudentID = Fit100Student.StudentID)
```
- Take the table UWStudent (presumably a general table of students at UW) and join it with Fit100Student (presumably a table of students in fit100) by combining records with the same student ID in both tables. Return all of the items that are in both tables, and display the students' names, student IDs and Exam 1 grade.
- 15 **What is SQL? Give one of its keywords (special words that are reserved for use in the language).**  
Structured Query Language. Although it's a standard language, there are

small differences in different dialects of SQL used by different vendors. SQL is used to query the tables of a database, to get some resulting view back. Some keywords: Select, from, where, group by, order, by, join, on, etc.

**16 What is the difference between a logical database and a physical database? Why should we keep logical and physical databases separate?**

Physical database = actual representation of the data as stored on disk

Logical database = representation designed to give users the information they need, specified by queries

It's important to keep the two separate because the physical database should avoid redundancy (among other technical constraints). The logical database allows us to create a database that meets our technical requirements while still giving us the data we want, the way that we want it.

**17 In setting up the physical database, various problems should be avoided. Give an example of one and describe what the problem is.**

A. "Redundancy" is the problem of storing the same information, for example addresses, in more than one place in the physical database. The "problem" is that the multiple copies can get out of synch and it is impossible to know which is the "correct" data.

**18 Suppose we have a table in a relational database named "countries". The table contains the following attributes: Country Name, Continent, Population, Gross Domestic Product. We need to choose a primary key for this table. Which attribute would we select and why?**

We would choose the Country Name as the primary key. The reason is that every entry in the countries table will have a unique Country Name. No two countries can have the same name, thus it would make an ideal primary key. None of the other attributes can be primary keys as there always exists a chance that two countries may have the same Population, or the same GDP.

**19 What are the advantages of disadvantages of "flat file" databases versus relational databases?**

Flat file databases store everything in one flat table, relationships between different items in a table aren't stored. This means that it's difficult to express structural information, you needed custom programs to process the information, information was repeated and difficult to combine, and changing one file means that everything associated with it must be changed.

Relational databases store information about different entities in tables and

relationships between these entities are stored as part of the database. This means that if you change something in one table, you don't have to change it everywhere else.

### ***Chapter 17: Privacy & Digital Security***

- 20 **Brian's computer is having problems. Whenever he opens Internet Explorer, it doesn't go to his normal home web page. In addition, there is a nagging search bar in his IE browser that won't go away and he can't find an uninstall option to remove it. Brian's computer science friend takes a look at his network traffic and notices that Brian's computer is sending off a lot of private information to unknown servers on the 'net. What is Brian's computer infected with and what steps should he take to remove and prevent it from happening again?**

Brian's computer is infected with spyware. The spyware is probably sending off information about his browsing habits to evil corporations (who will in turn sell it for profit!). To remove the spyware, Brian installs an anti-spyware program such as Lavasoft's Ad-aware or Microsoft's Windows Defender. He should also ensure that the automatic update is turned on and that he is always loaded with the latest spyware "definitions". Thus, he can be protected from the latest spyware that come out on the internet.

- 21 **What is a phishing attack? What are 3 strategies that phishers use to get what they want?**

A phishing attack is a fraudulent message (usually e-mail) designed to trick people into giving up personal information (passwords, credit cards, SSN) Phishers may use the following tactics:

- a. Use phony e-mail address and sender name
- b. Copy official graphics and web pages to appear official
- c. Present an urgent problem that the recipient feels compelled to address

### ***Chapter 23: Limits to Computation***

- 22 **Explain why in a game like chess, the computer does not explore the whole game tree.**

The game tree--the enumeration of all possible game sequences--is too large for even the largest, fastest computers. This is because from each board position, several other board positions are possible, creating an "exponential" explosion of the size of the tree that's even too large for the largest computers.

- 23 **What is the set-up for the Turing test?**

Two identical rooms are connected electronically to a judge's computer. In one room is a computer and in the other is a person. The

judge asks questions of each, trying to decide which room contains the person.

24 **What does it mean for a problem to be intractable?**

If a problem is intractable, this means that the best currently-known algorithms for solving it would take so long that it is completely unrealistic in practice, even though theoretically, a solution could be found.