University of Rochester	Computation and Formal Systems (CSC173)

Homework 2
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You will not hand in the answers to this homework assignment. Instead, at the beginning of class on **2 October 2002** you will be asked to solve one of the problems as a closed notes, closed book quiz. The question to be solved will be randomly selected.

1. In class we used an example database from the book with the relations CSG, SNAP, CDH, and CR. The book also defines a 5th relation, namely CP, for course/prerequisite (see p.408). Using these relations, write a relational algebra query which answers the questions: what grade(s) did C.B. receive in the prerequisite for CS101.

2. Write a query which yields the same result as your answer to the first question, but in which you push selection and projection as far down as they can go. Which, if any, of these pushed operations are not meaningful and why.

3. What is wrong with the following code? How can I fix using dynamic memory allocation it so that it does not core dump?

```
int *a;
*a = 5;
```

4. What is the output of the code below. If there is something wrong with the code (i.e., it doesn't do what you would expect from the names of the functions), how would you fix it?

```
#include <stdio.h>
void changeIt(int []);
main() {
  int a[5]  = {0,1,2,3,4};
  int *p = a;
  printf("p has the value %d\n", *p);
  changeIt(a);
  p = a;
  printf("p has the value %d\n", *p);
}
void changeIt(int a[]) {
  int i=777, *p = &i;
  a = p;
}
```

5. On a UNIX system, what is the difference between the output yielded by `ps` and `jobs`?

6. Explain separate compilation, and why a Makefile is nearly essential when working on a large project with many source files.