See the list of problems below and on reverse. Do them. I would like you to spend at least 3 hours on this over the weekend. You do not have to do all of the problems but you should give an honest effort and put in about 3 hours. Do the best you can. The more you actually practice programming the better off you will be in this class (and future classes if you take more CS). If you have any questions, I may be able to them by email this weekend, but I’m not sure how much access I will have.

For each program that you complete, create a short report, and then record the approximate number of minutes you spent working on the problem in the space provided. Staple together your reports, in order, to this sheet, with this sheet on top, and hand the “package” in next class.

Your programs should be similar to the GPA03 program posted on the web site:

http://www.csc.villanova.edu/~joyce/csc1051/fall09/projects.html

For each program you need to declare variables of type int. Use “good” names for your variables, names that “fit” the usage of the variable (for example I used credits for the number of credits in the GPA program).

Then you need to use an arithmetic expression (or two or more?) to calculate the answer. Instead of declaring and calculating the “answer” all in the same statement as is done in the GPA example:

```
    double gpa = qp / credits;
```

it is probably better if you declare the answer variable in one statement and then calculate the value in another statement. That is how we will do things as the semester proceeds and we add “input” to our programming tools. More like this:

```
    double gpa;
    gpa = qp / credits;
```

Finally your program prints a nice statement of the results, which includes all the pertinent information.

1. Create a program that declares int variables to hold the cost of a new pair of shoes (28) and the number of pairs of shoes Julie wants to buy (15), initializes the variables, and then calculates and prints out the total cost.

   How long did you spend on this problem? _________

2. Everyone knows that 1 year in a dog’s life is the same as 7 years in a human’s life. Write a program that declares an int variable to hold the number years that a dog has lived, sets that variable to 4, and then calculates and prints out the equivalent number of person years. You can/should use any name for the dog that you like in your output.

   How long did you spend on this problem? _________
3. Create a program that declares `int` variables to hold the cost of a new pair of shoes (28), the number of pairs of shoes Julie wants to buy (15), the number of pairs of shoes that Julie actually buys (3), initializes the variables, and then calculates and prints out the amount of money saved by Julie not giving into her crazy spending desires (i.e. the money not spent on the extra pairs of shoes).

How long did you spend on this problem? __________

4. Create a program that declares `int` variables to hold the number of one dollar, five dollar, and ten dollar bills that Fred has in his wallet, initializes the variables to 3, 2, and 5, respectively, and then calculates and prints out the total amount of money that Fred has in his wallet.

How long did you spend on this problem? __________

5. Everyone knows that if you have n bits you can encode $2^n$ “things”. Write a program that declares an `int` variable to hold the number of bits used for a data type, sets that variable to 16, and then calculates and prints out the number of things that can be encoded by that data type.

How long did you spend on this problem? __________

6. What time is it right NOW? _____:_____:_____, (AM or PM? Circle one)
   Tell me to the second, for example 3:13:52 PM. Create a program that declares `int` variables to hold the number of hours, minutes, and seconds that have gone by since midnight today (whatever day you are doing this) based on the current time you recorded. Set those variables to the appropriate values (for example if the time recorded was 3:13:52 PM you would set them to 15, 13, and 52). Your program should now calculate and print the total number of seconds that have gone by since midnight.

How long did you spend on this problem? __________

7. Thirty thousand, three hundred and forty five seconds have gone by since midnight. Create a program that declares an `int` variable to hold that number, and other variables to hold the equivalent number of hours, minutes and seconds. It then calculates and prints out the equivalent number of hours, minutes and seconds. This problem is the “reverse” of the previous problem.

How long did you spend on this problem? __________

8. Tom needs to read a book in the next 7 days. Tom wants to spread his reading out evenly, so intends to read the exact same number of pages every day, except on the final day he is willing to read a few extra pages to “even things out”. For example, if his book was 23 pages long, he would read 3 pages a day, but on the last day he would read 5 pages. In fact, his book is 393 pages long. Create a program that declares an `int` variable to hold that number, a variable to hold the number of pages he will read the first 6 days and another to hold the number of pages he will read on the last day. It then calculates and prints out those numbers.

How long did you spend on this problem? __________