**Computer Science 112 Spring 2013**

Lab 4

**Due by in class one week from today.**

Put the answers to the questions 1 and 2 in separate block comments at the top of the java file for part 3. This java file should be zipped together and submitted on moodle under “assignment 4.”

1. True or False

* 1. The following command will leave a line of whitespace after “word”:

System.out.printf(“word \n \n”);

* 1. The following command will throw a runtime error (where value1, etc are doubles):

System.out.printf(“%f%f \n %.2f”, value1, value2, value3);

* 1. The following command will fail to compile (where value is an integer):

System.out.printf(“%.2d”, value);

* 1. The following command will truncate the number it's trying to print:

double number = 12.9999;

System.out.printf(%2f, number);

* 1. The following combines left justification with number of minimum field width:

int n = 1239999;

System.out.printf(“Number is: %,-20d!”, n);

(T/F) It displays:

1,239,999 !

* 1. The following combines leading zeros with commas:

int n = 1239999;

System.out.printf("Number is: %,013d!", n);

(T/F) It displays:

00,001,239,999!

1. Short Completion: write lines of code to accomplish each task. Assume x is a float containing the value of π out to ten decimal places. Assume y is a float containing the value of the mathematical constant e out to ten decimal places. Assume z is an integer whose value is 5. Assume w is the integer 100 and is used in the program as a number of dollars.
   1. Print the following line using printf and y:

The number e such that ln(e^1)=1 is approximately 2.718.

* 1. Print the following lines using printf and x (note, you can earn bonus points if you figure out how to do this with the Greek symbol π instead of “pi” below):

Many use the fraction 22 over 7 as an approximation for pi,

since it's approximately 3.14

* 1. Print the following line using printf, x, and z:

The area of a circle of radius 5 is approximately 3.14159 \* 5 \* 5

* 1. Print the following lines using printf, x, y, and possibly some helper variables:

It is not known whether pi + e is rational nor whether pi\*e is

rational. These numbers are approximately 5.86 and 8.54

* 1. Print the following lines using printf, y, and w (and that %%/ prints as %/):

If you put $100 in the bank and it earns interest of 100%/ n

in each of n compounding intervals then the value at year's end

will be $1.00x(1 + 1 / n)^n, and the limit is 2.71828...

* 1. Suppose k is a double. Write code which prints “Dollars: $k” with commas, 2 decimal places, minimum field width 10, and left justification (e.g. “Dollars: $1,000,000.00”)

1. We will be writing a program that a student could use to determine his/her final grade in this class at the end of the semester. The program must get the following information from the user via a scanner:

String name

String courseTitle

double quizGrade – assume this is between 0 and 100

double homeworkGrade – assume this is between 0 and 100

double examGrade – this is the average over all exams and is between 0 and 100

double finalGrade – this is for the final project. It's between 0 and 100

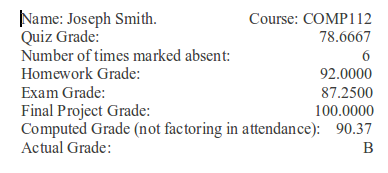
int absences – This is the number of times marked absent

Use these values to compute the course grade. Recall that from the syllabus, exams are worth 40%, homework is worth 30%, the final project is worth 20%, and quizzes are worth 10%. Use this to find the weighted average computedGrade, which stores the users total grade as a double between 0 and 100. Use constants to make your code easier to tweak for classes with a different grading scheme, e.g. put lines like this at the beginning of the main method and use this constants rather than the numbers themselves when you do the computation:

final double QUIZ\_RATE = .1;

Recall from the syllabus that 5 or more times marked absent will lead to a drop of one letter grade, while 8 or more absences will lead to an automatic F. Factoring this in and using computedGrade, create a character letterGrade, assuming that 90-100 is an A, 80-90 is a B, 70-80 is a C, 60-70 is a D, and less than 60 is an F. You may assume a 90 itself is an A, i.e. you may round up for students who are on-the-fence.

Print a report card for the student which includes all the variables above. Round the doubles which were inputted to 4 decimal places. Round computedGrade to 2 decimal places. Use minimum field width to make sure all results are appearing in a right-justified way. Here is an example of what your output might look like:



Finally, determine if the student passed or not and print either “Congratulations, you passed!” or “Sorry, you failed”