Due Date: Tue, Feb 10 (before 5pm)

Homework weightage: 5%

PARTA - JAVA CHARACTERISTICS (5 marks)

Briefly elaborate any two distinguishing characteristics of Java with examples (illustrate with figures if necessary).

PART B - PRINT SONG (5 marks)

Notice that the following version of a children's rhyme (which is also said to be adapted from an Irish war song) has a cumulative structure. That is, the verses are built from earlier verses usually by adding a line and sometimes by varying repeated lines.

'The Ants Go Marching'

The ants go marching one by one,
"Hurrah!, Hurrah!"
The ants go marching one by one,
"Hurrah!, Hurrah!"
The ants go marching one by one,
The little one stops to suck his thumb.
And they all go marching down,
To the ground, to get out, of the rain.
BOOM /'\ BOOM /'\ BOOM /'
//Should be a blank line after each stanza ending with BOOM BOOM BOOM

…two…tie her shoe…
…three….climb a tree…
…four…shut the door…
…five…take a dive…
…six…pick up sticks…
…seven…pray to heaven…
…eight…check the gate…
…nine…check the time…
…ten…say "The End!"

Write a Java program in a project named `Assignment1` that contains a class named `PrintSong` with a `main` method that prints out the song *The Ants go Marching*. The output should be **exactly** the same as the song above (in full form, not in short form as written above to save space), including spelling, capitalization, spacing, blank lines, and punctuation. For our amusement, you must add an additional verse of your own making that follows the pattern of

the other verses with eleven, but nothing offensive or unpleasant, please.

It is easy, of course, to write the program using a series of `println` statements for each line of the song. But the goal the assignment is to take advantage of the cumulative structure of the song to avoid redundancy.

That is, for each verse of the song, you should write a separate static method that prints the whole verse. The main method will call these methods to print the complete song. By looking at the structure of the song, however, you can write additional methods that avoid the redundancy in the song.

For example,

The ants go marching one by one,

“Hurrah!, Hurrah!”

appears several times in the song. But your program should should have only **one** `println` statement that includes that text string.

All but one or two methods must print more than just one line of the song. **Do NOT write a separate method for each unique line of the song and then call these methods in order.** You need to find several lines that appear multiple times in the song and have a method that prints those lines. That method can use `println` and/or call another method, which can, in turn, call another method if need be, and so on.

Only consider **whole** lines of the song for redundancy. You can **ONLY** consider redundant fragments of lines **ONCE**, such as "The ants go marching”(not necessarily this one). You have to decide which fragment/phrase will be the best since you can ONLY USE 1 FRAGMENT/PHRASE.

Specifically, you MUST NOT use the `print` statement and no variables, parameters, conditionals, or loops.

Hint: Our solution uses X number of static methods in addition to the `main` method. The `main` method includes `println` statements to print the title and blank line, and calls methods to print each verse. The whole program contains only one `println` statement for each unique line in the song.

Don't forget to include a screenshot of output and comments at the beginning of program with assignment number, date, your name, email, the time it took to write the program, and a brief description of the purpose of your program.

```
// JohnDoe
```

```
//jd123@nyu.edu
// Assignment #0
// 20 May 2009
// 2 hours
//
// This program prints...
```

Items that we will look for when we grade include:

- Is there a header with your information?
- Does the program following programming conventions, such as indentation and appropriate capitalization?
- Does the program compile?
- Does the program produce the **exact** same output as above?
- Is there a method for each verse?
- Are there redundant program statements (other than to print blank lines)?
- Has the structure of the song been used in the solution?

**********Happy Java-ing**********