A) Homework assignment submission requirement/policy

Each homework assignment may contain a set of problems with a due date specified usually one week from the date the problem set is assigned. Assignments will be posted on my website and handed out in class. Each problem in an assignment shall receive a separate grade.

Each homework assignment should be turned in before the specified due time. In case you cannot complete a problem by the beginning of class on the due date, you can take another two days to work on the problem and turn it. The penalty for such a period late submission will be 20 percent. If you hand the problem in two class periods late, the penalty shall be 40 percent for that problem. Beyond one week from the specified due date the problem shall NOT be graded for any reason.

Please assemble all homework in an envelope or folder of your choice. I shall not accept loose homework. The folder should keep the contents from falling out and contain:

1. A clear header including your name (and your partner name in case some lab assignments), assignment number and problem number.
2. A copy of the homework assignment sheet.
3. A printout of all source code and supporting comments.
4. A printout of the output from each program (you may use Alt + PrtSc to copy the console output, and use Ctrl + v to paste it to the project report, say a Word document).
5. A 3 ½ inch DOS-format floppy (or a CD-ROM, or use a USB drive) containing all source code needed to compile and run your program. This diskette must not contain any files unrelated to the problem set. I shall compile and run each program that you submit as well as examine your source code. This source code must be nicely and consistently formatted. Unformatted or difficult to decipher code shall result in a grade reduction for the particular problem being graded.
6. If your problem is one or two class periods late you must clearly state this on top of the first sheet.
7. A self-assessment of each problem. This should indicate whether you believe you have completed the problem successfully. It may also discuss any special difficulties that you have had in solving the problem.

Programs will be graded by compiling and running them on a PC configured like the lab computers. Make sure that the programs can be tested at the DOS console, by the use of javac and java commands. I will NOT use any IDE to grade the programs, though you can use any IDE such as NetBeans to develop the programs. Please verify the contents of your disk before turn in. It is not uncommon to receive disks that contain nothing. That is the grade that is awarded.

If a program does not compile at the DoS console, it shall receive an automatic grade of 0. If a program produces run-time or logical errors you shall receive only partial credit.

* Note: The homework assignment is to be individually completed by yourself. Copying the work of another student whether that work is a homework program or an exam problem is cheating. Obtaining code via the Internet is cheating. You must write your own programs completely and not modify some other student’s work to disguise that the work has not originated from you. It is usually quite easy to see through such disguises. You are always welcome to discuss concepts with fellow students. You must draw a sharp line between discussing a concept and its implementation in a program. The former cooperation is allowed the latter is cheating.
B) Problems
* For full credit your solution must have minimal code redundancy and strictly follow the coding conventions. Think about your answers.

1. (Exercise 2.2: computing the volume of a cylinder) 20%
Write a Java program that reads in the radius and length of a cylinder and computes its volume using the following formulas:

\[
\text{area} = \pi \cdot \text{radius} \cdot \text{radius}
\]
\[
\text{volume} = \text{area} \cdot \text{length}
\]

You should use the console to read in the inputs and display the results.

2. (Exercise 2.9: calculating the future investment value) 40%
Write a Java program that reads in investment amount, annual interest rate, and number of years, and displays the future investment value using the following formula:

\[
\text{futureInvestmentValue} = \text{investmentAmount} \cdot (1 + \text{monthlyInterestRate})^{\text{numberOfYear} \cdot 12}
\]

You should use a dialog box to read in the inputs and display the result. For the result, you should keep two digits after the decimal point. For example, if you entered amount 1000, annual interest rate 3.25%, and number of years 1, the future investment value is 1032.98.

Hints: Use Math.pow(a, b) method to compute \(a\) raised to the power of \(b\).
\[
\text{double c} = \text{Math.pow(a, b)}
\]
will return \(c = a^b\). You may refer to the 2.12.1 Example: computing loan payments for more help.

3. Calculating Body Mass Index (BMI) 40%
Write a Java program to prompt the users to enter their name, their weight in pounds, and their height in inches. The program will output the user’s name, body mass index (BMI), and the weight status. For this program, you may use either a dialog box or the console to read in the inputs and display the results.

According to the literature, BMI is calculated by the following formula:

\[
\text{BMI} = \left( \frac{\text{Weight in Pounds}}{(\text{Height in inches}) \cdot (\text{Height in inches})} \right) \times 703
\]

The significance (weight status) of BMI is given as follows:

<table>
<thead>
<tr>
<th>BMI</th>
<th>Weight Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below 18.5</td>
<td>Underweight</td>
</tr>
<tr>
<td>18.5 – 24.9</td>
<td>Normal</td>
</tr>
<tr>
<td>25.0 – 29.9</td>
<td>Overweight</td>
</tr>
<tr>
<td>30.0 and Above</td>
<td>Obese</td>
</tr>
</tbody>
</table>

Hint: (1) Think about what data types, \(\text{int, double, string, etc.}\), may be used for the variables.
(2) After the BMI is calculated, you may use \text{if ...else} statements to get the weight status. You may leave this part to finish after the next lecture. (3) Do the problem step by step (input, calculation, output, etc.). You may receive partial grade if some steps are completed correctly.