

Engineering 1D04

Assignment I

The following is due at the **BEGINNING** of the tutorial (JHE 317-319) the week of Jan 20 to 24, 2003:

- 1) The pseudo-code for the given problem. This must be typed, not hand-written. Make sure that you keep a copy of the pseudo-code so that you can use it to develop your C code. You will also need a copy to hand-in as an appendix for the next assignment.
- 2) Answers to the question(s) provided at the end of this assignment.

NOTE: Please include your tutorial number on every assignment. Also, remember that at the top of the first page of every assignment the following must be included:

“This assignment represents my own work”,

followed by your signature, and your e-mail address. You need to include this information, or your assignment mark will be ZERO. Late assignments should be taken to the Drop-In-Centre (ITB/101). Late assignments will not be accepted after 4:30 on the day of your tutorial.

Problem

Write the data declarations, pseudo-code for a program that will compute the following:

- (i) the length l , of the pier (Figure 1), from the shore to a point where the depth of the water body is h (the value of h is known);
- (ii) the angle of the bottom inclination β (degrees), and
- (iii) the total volume V_T of two cylindrical pillars supporting the far edge of the pier.

The depth H of the water body at the given distance L is known.

We assume that the angle of the bottom declination does not change as we move away from

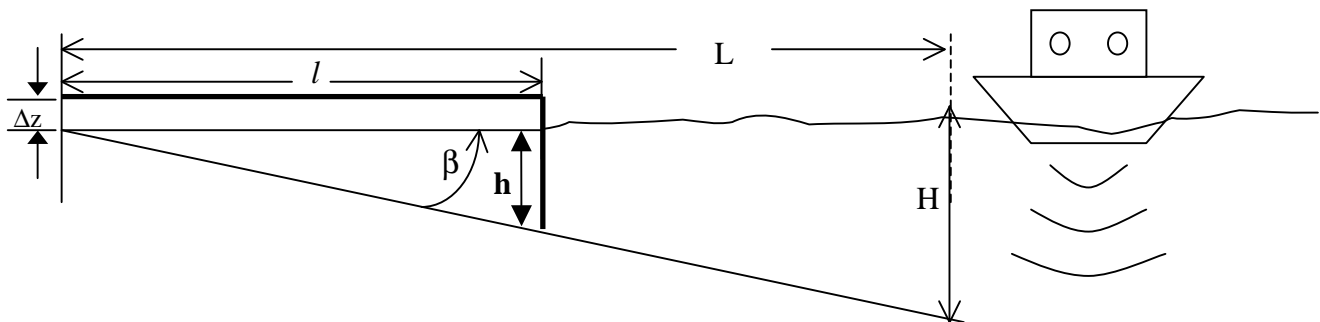


Figure 1

the shore. The value of H can be measured from a ship, which cannot come closer to the shore than L . The pillars of diameter $d = 0.3$ meters stand on the bottom surface. The top of each pillar that is vertical to the undisturbed water surface extends above the water surface by the height $\Delta z = 0.5$ meters. The total height of each pillar is $h + \Delta z$.

The assignment is to compute:

- (i) the angle β (degrees) if the values of L and H are known
- (ii) the length of the pier l (m) if the value of h is known
- (iii) the total volume V_T (m^3) of two pillars supporting the pier

Steps

- 1) Read values L , H , d , Δz and h . Normally, after the values are read, they are checked for validity. However, to simplify this assignment, we will assume that the data are always input correctly.
- 2) Compute β
- 3) Compute l
- 4) Compute the height of the pillars
- 5) Compute the total volume of two pillars
- 6) Output the results of the computations

Questions

- 1) You developed a pseudo-code that can be used to solve the problem that we discussed. For which programming language(s) does your pseudo-code form a proper basis that makes the process of coding easier?
- 2) This is a two part Question:
 - i) Do you think that a PC “understands” pseudo-code? Give an answer of “Yes” or “No” and briefly explain why.
 - ii) What program does a computer have to have in order for it to “understand” C code?