ENG222-03
Fall 2011
Computer Project 2

Due Date: 11/21/11

The objective of this computer assignment is to help you gain a better understanding of moment concepts and equivalent systems that have been discussed in class (Chapter 4).

Problem Statement:

You are required to Write, Run, and Test a computer program to determine the equivalent force-couple system at any point for a given system of forces applied at a structure or a machine part. Use the unit vectors "***i***, ***j***, ***k***" along with utilization of determinants to accomplish this task.

Code Requirements:

- You must use either C++ or MATLAB
- You code MUST contain adequate documentation – this means that I should be able to understand what you are doing in the main computational portions of the code (use comments in the code).
- Ideally your code should be interactive – allowing keyboard input and then display the output directly on screen.
- Provide THREE Example sets of data. Three problems are attached
- The final result must be expressed in Cartesian form and the associated proper units.
- Significant figures and engineering notation are also required in your output.

You are expected to hand in the following:

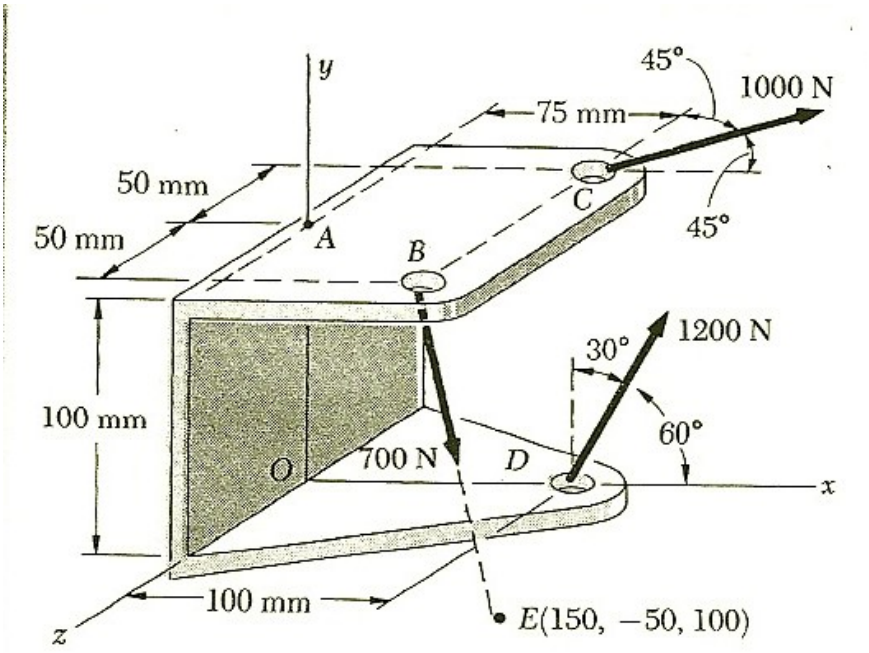
- Cover page
- Short introduction (1 paragraph) explaining what your code is supposed to do
- Logic flow chart of your code (using proper symbols, include decisions and loops)
- Hard copy of your code
- The three required problems solved by hand (using homework format)
- Input vs. Output results (of the three problems)

Note: Students may work together to generate a flow chart. However, each individual must work independently to create his or her own unique program.

See me with any questions.

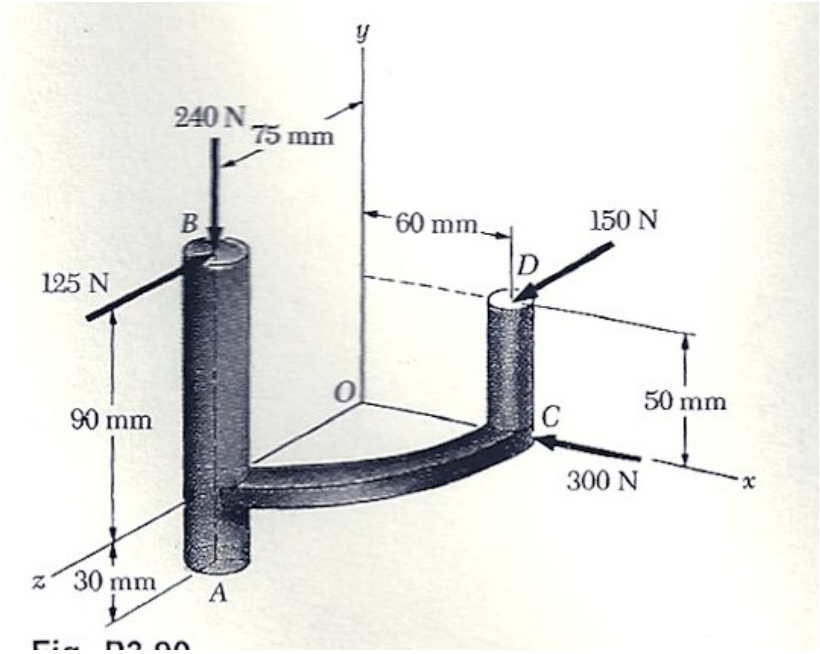
Problem 1:

Three cables are attached to a bracket as shown. Replace the forces exerted by the cables by an equivalent force-couple system at A.



Problem 2:

A machine component is subjected to the forces shown, each of which is parallel to one of the coordinate axes. Replace these forces by an equivalent force-couple system at A.



Problem 3:

Three forces are applied to the cantilever shown. Replace the three forces shown by a force-couple system at A.