Object Oriented Programming LAB – BSDSF24

(Both Morning and Afternoon)

Lab 07 –18-03-2025

use notepad++ and developer command prompt for the following tasks

command to only compile the current CPP file is	**CL /c file.cpp**
command to only compile and link all CPP files is	**CL file1.cpp file2.cpp file3.cpp**
command to only link all the object files is	**LINK file1.obj file2.obj file3.obj**

Alternatively, in IDE create a project and all code files into it

1. You are provided with code for point class in three dimensional cartesian space named **Point3d**. The equation of a plane in three is ***ax + by + cz + d = 0***, which is very similar to that of a line in 2D plane as ***ax + by + c = 0***. You have to create a class named **Plane2d** with the following functionalities, at least. **[20 marks each]**

    1. Parameterized constructor
    2. Is a point lies on the plane
    3. Are the two planes equals (operator== overload)
    4. Are the two planes parallel
    5. Distance of a point from a plane

    Hints:

    - Parameters of the constructor are a, b, c, and d
    - Point (x_1, y_1, z_1) lies of plane ax+by+cz+d=0, iif $ax_1+by_1+cz_1+d=0$
    - Two planes $a_1x+b_1y+c_1z+d_1 = 0$ and $a_2x+b_2y+c_2z+d_2 = 0$ are equal, iif ratios of all respective constants are same

    $$\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2} = \frac{d_1}{d_2}$$

    - Two planes $a_1x+b_1y+c_1z+d_1 = 0$ and $a_2x+b_2y+c_2z+d_2 = 0$ are parallel, iif ratio of respective constants coefficients of x, y and z are same

    $$\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$$

    - Distance of a Point (x_1, y_1, z_1) lies from plane ax+by+cz+d=0 is

    $$D = \frac{|ax_1 + by_1 + cz_1 + d|}{\sqrt{a^2 + b^2 + c^2}}$$

Thank you for your patience