Birla Institute of Technology and Science, Pilani (Rajasthan)
Pilani Campus
First Semester 2021-2022

SS G552 (Software Testing Methods) **December 02, 2021** **Assignment (15%)**

Select the assignment, from the assignments given below, as per the following expression:
Assignment = [Last Three Digits of your BITS ID % 21] + 1, where % evaluates integer remainder.

Assignments:

1. For three points in 3D determine if these points form plane or are collinear.
2. For three points in 3D determine if these points form a plane, then find the distance of this plane from the origin else state that the given points are not planar.
3. Given four 2D points check if they form a rectangle or square. If not, simply state neither square or rectangle.
4. Given four points in 2D check if they form a rhombus other than a square. If not, simply state not a rhombus.
5. Given four points in 2D check if they form a trapezium with parallel sides parallel to X-axis. If not, simply state that it is not the case.
6. Given four points in 2D check if they form a trapezium with parallel sides parallel to Y-axis. If not, simply state that it is not the case.
7. Given four points in 2D check if they form a trapezium with parallel sides parallel to X = Y line. If not, simply state that it is not the case.
8. Given four points in 2D check if they form a trapezium. If not, simply state that it is not the case.
9. Given five points in 2D check if they form a regular pentagon such that one side is parallel to the X-axis. If not, simply state that it is not the case.
10. Given five points in 2D check if they form an irregular pentagon such that one side is parallel to the X-axis. If not, simply state that it is not the case.
11. Given five points in 2D check if they form a regular pentagon such that one side is parallel to the X-axis. If not, simply state that it is not the case.
12. Given five points in 2D check if they form an irregular pentagon such that one side is parallel to the X-axis. If not, simply state that it is not the case.
13. Given five points in 2D check if they form a regular pentagon such that one side is parallel to the Y-axis. If not, simply state that it is not the case.
14. Given five points in 2D check if they form an irregular pentagon such that one side is parallel to the Y-axis. If not, simply state that it is not the case.
15. Given five points in 2D check if they form a regular pentagon such that one side is parallel to the X = Y line. If not, simply state that it is not the case.
16. Given five points in 2D check if they form an irregular pentagon such that one side is parallel to the X=Y line. If not, simply state that it is not the case.
17. Given two directed lines in 3D find angle between them. If all the points are collinear then state so.
18. Given a line segment in 3D find its projection on another line. If all the points are collinear or two are parallel, then state so.
19. Given equation of a plane in the form ax + by + cz + d = 0. Take two sets of the coefficients a, b, c, and d, and then find the coefficients of the plane bisecting the angle between two planes.
20. Given three points in 3D representing a plane and two points in 3D representing a line. Find the intersection of the line with the plane. If there is no intersection, then state so.
21. Given two sets of two 3D points each set representing a line in 3D, find intersection point of these two lines. If there is no intersection, then state so.

Do the following:

1. Develop a well-documented and commented computer program (using any programming language of your choice) for the problem stated in your assignment. First line of the program must put in a comment the programming language used by you. Develop program sufficient enough to take the input, perform the process as per the assignment and displays the output.
2. Draw the control flow Graph of the program for the program developed above.
3. Derive minimal MC/DC tests for the program developed above.
4. Draw data flow graph for the program developed above.
5. Derive All-uses coverage tests for the program developed above.

Marks [3 + 3 + 3 + 3 + 3 = 15]

Work independently (i.e. not in a group), and submit (by email at rohil@pilani.bits-pilani.ac.in) the key-in solutions latest by December 07, 2021 by 11:59 PM. The subject-line of the email should be as "**2021_1 || STM Assignment-NN || Your BITS ID (Your Name)**" in the subject of the email. NN = Assignment Problem Number represented in two digits (i.e. 01, 02, ….10, ….)

Note:

- For the delayed submissions not exceeding two days, per day (or part of a day) 0.5 marks will be deducted. Beyond this, submission of a document up to five days' delay (counted from the original deadline**,** i.e. on 3rd to 5th day after deadline) will be evaluated out of 50% of the maximum marks (MM).
- Submission after five days' time from the original deadline will be awarded no credit.
- For email attachments, please give the filenames as your BITS ID followed by **_ANN** where NN means your assignment number in two digits (i.e. 01, 02 …., 10, 11, ….). For example, for BITS ID 2019A7PS013, the filenames should be as follows: 2019A7PS013_A14.pdf
- **After examining your source code and other solution, some or all of you may be asked for a demonstration and/or viva.**