

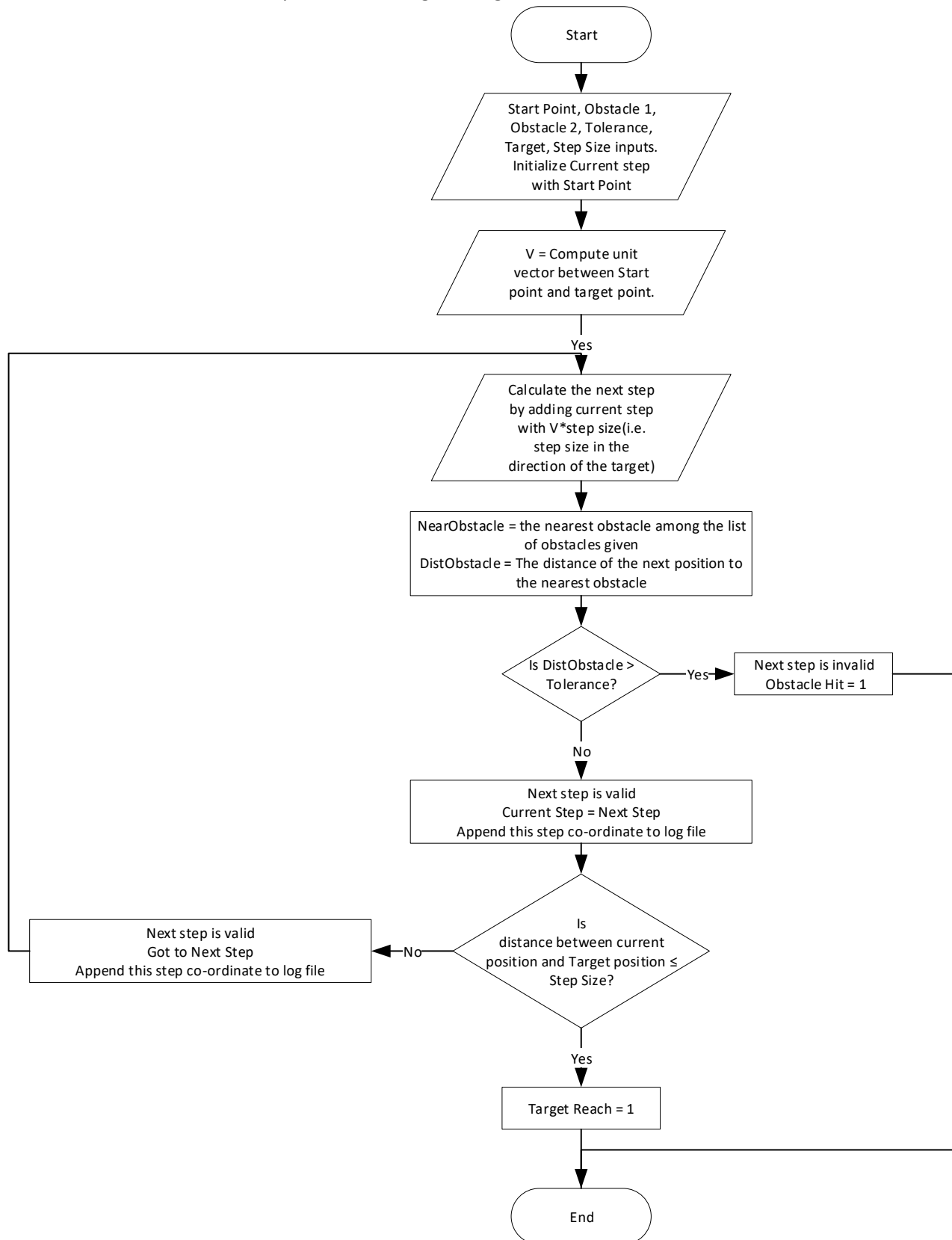
SC627
Assignment-1

Roll No. - 213234002

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E1.8 Lectures on Planning and Robotic Planning and Kinematics

i. Sketch a flowchart and implement the BugBase algorithm



Implemented in Matlab code – Assignment_BugBase

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- ii. Describe in a paragraph how you will modify BugBase to implement the Bug 1 algorithm. Explain the roles of the geometric functions in Exercises (E1.6) and (E1.7) and what new logic will be needed.

Ans. The change required for the Bug1 Algorithm to be implemented from Bug base algorithm is to not stop once the robot hits the obstacle. Once the robot hits an obstacle, it must circumnavigate the obstacle, and keep logging distance of each circumnavigation point from the target point. Each point will be directed towards anti-clockwise tangent to the obstacle – Hence using the “computeTangentVectorToPolygon” function. The “computeTangentVectorToPolygon” function uses all other functions given in Exercises (E1.6) and (E1.7). Once circumnavigation of the obstacle is complete, the robot shall hunt for an escape point. This point will be the point where distance lesser than the minimum of the logged distance of each circumnavigation point from the target point. The escape will be in the direction of the target point. The logic will only stop once target point is reached by the robot.

- iii. Implement a fully-functioning version of Bug 1, described as follows

Ans. Implemented in Matlab code – Assignment_Bug1

- iv. Test your program on the following environment: start = (0, 0) and goal = (5, 3)

Ans. The space will look like following figure. The data is kept in file - Bug1.xlsx

