SMART INDIA HACKATHON 2022

Ministry /Organization Name/Student Innovation :
Ministry of Rural Development

PS Code : SH1001

Problem Statement Title :
Create a System for drawing a complete polygon for any small asset (i.e. Assets developed during MGNREGA, PMAYG schemes) by knowing 3 coordinates along with the length and width.

Team Name : Team BITKNIGHTS

Team Leader Name : Parikshit Satibavane

Institute Code (AISHE) : C-58531

Institute Name : Bajaj Institute of Technology, Wardha

Theme Name : Smart Automation

Objective :

- To include correlations (beyond anti-symmetry) that arise in transitional nuclei and to treat anharmonic effects to restore symmetries.
- User will determine that the interior angle of a polygon and an exterior angle of a polygon form a linear pair (i.e., the two angles are supplementary).
- User will determine that if one exterior angle is drawn at each vertex of a convex polygon, then the sum of the measures of those exterior angles is 360°.
- User will determine a formula for the measure of one exterior angle of a regular polygon and use this to discover an alternative form for the formula that is typically used to calculate the measure of the interior angle of a regular polygon.

Idea/Approach Details :

Solution :

* Getting four Coordinate from 3 co-ordinate is geometrically possible based on the assumption that 4th co-ordinate will have the point on the regular rectangle.
* let A,B,C are the co-ordinate of a triangle (3 points which is input to draw the rectangle).
* Convert Input Vertices in the order from clockwise.
* Draw a line joining AB from such that its intersect perpendicular to the line AB Name it as D.
* Compute distance AC & BD using given coordinate.
* Compute the distance AB & BD from the input co-ordinate (Distance will be absolute distance converting in into PCS).
* Draw a imaginary line parallel to AB passing through point C ,Name it as EF.
* Make the point A' equivalent to the distance AB on the line from the point c.
* Make the point B' on the imaginary line EF equivalent to the distance BD from the point C.
* Join the line AA' CB' BD making regular rectangle as polyline.
* Project the polyline on the GCM co-ordinate.
* Covert polyline to polygon.
* Compute area using shoelace algorithm,Denote Nothing.

The M5P model tree is a reconstruction of Quinlan's M5 algorithm (Quinlan, 1992) that is based on the conventional decision tree with the addition of a linear regression function to the leaves nodes.

Shoelace algorithm is a mathematical algorithm to determine the area of a simple polygon whose vertices are described by their Cartesian coordinates in the plane.

A **polyline** is a list of points, where line segments are drawn between consecutive points.

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MINISTRY OF RURAL DEVELOPMENT

Technology Stack

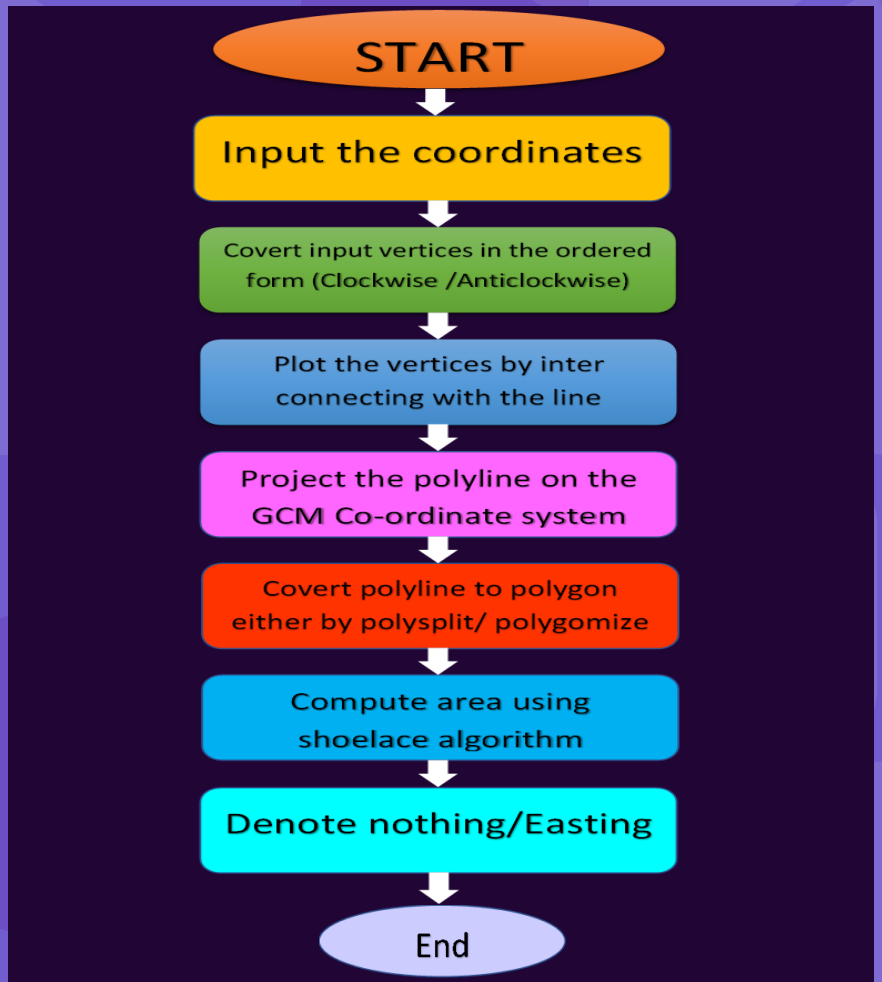
Google Earth

Machine Learning

python

MATLAB

FLOW CHART :



Scheme :

प्रधान मंत्री आवास योजना-शहरी
Pradhan Mantri Awas Yojana-Urban

Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA)

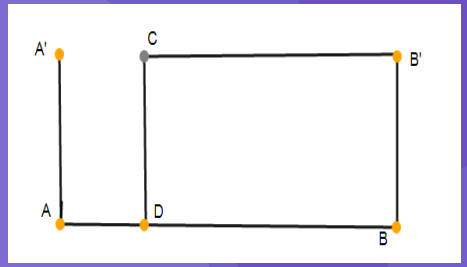
Special Features :

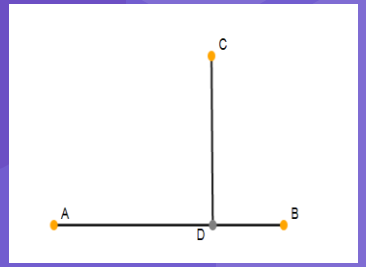
1. GCM has two operations, authenticated encryption and authenticated decryption. The authenticated encryption operation has four inputs, each of which is a bit string.
2. M5P combines a conventional decision tree with the possibility of linear regression functions at the nodes.

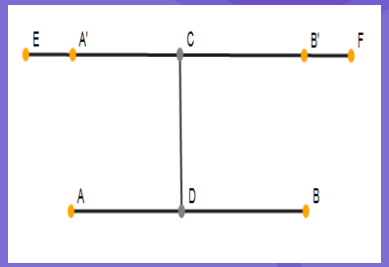
Benefits :

1. M5P algorithms require few user-defined parameters.
2. M5P can algorithm provide mathematical equations, offer more insight into the obtained equations.
3. It is more convenient to develop and implement.
4. GCM can act as a stand-alone message authentication code (MAC), and can be used as an incremental MAC.

User-Interface :







Conclusion :

- Creating a Complete Polygon based on M5P model using GCM Coordinate.
- Accurate Polygon can Help User to Detect Polygon using 3 coordinates.
- M5P Model is based on complete polygon is uused to determine interior and exterior angle of a polygon form a linear pair.
- M5 model tree is a regression technique for the latter case.
- A self-overlapping polygon can have multiple "interpretations" but the Shoelace formula can be used to show that the polygon's area is the same regardless of the interpretation.

TEAM MEMBER DETAILS

Team Leader Name : Parikshit Satibawane
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MENTOR DETAILS

Team Mentor 1 Name: Mr. Pravin Rathod
Category : **Industry**
Expertise : **Water Resource Engineering**
Domain Experience : **9 years (7+2)**

Team Mentor 2 Name: Prof. Sandesh Jain
Category : **Academic**
Expertise :
Domain Experience : **4 Yrs.**