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MAPMe

Mapping **A**pplication **P**rogramming language **M**ade for **E**veryone

Programming Languages and Translators

Project Proposal

I. Language

MAPMe is designed to allow users to develop map infrastructures and associated algorithms using features provided by the language. The intricacy of the map built by the users, such as the details of the topography, will be based on the users' discretion. These maps can be comprised of objects such as roads, buildings, trees, etc. The user can develop custom tools to suite their applications' need. One example of this is if the user develops a hash table data-structure to store supplementary tags for each building (i.e. restaurants, schools, libraries, etc.) for quick search access. Our language gives the user the potential to build robust and detailed maps that can be practically used for many real world applications such as calculating distances, routes, and travel times.

II. Real World Implementations

Example 1: College Students can create a representative map of their campus and determine how long it takes to get from their campus dorm or from class to class.

Example 2: A user can model their neighborhood and the location of their favorite fast food restaurant and can calculate the shortest distance from their home to a restaurant. The user can build mode of transportation objects which has the potential to calculate estimate time of arrival.

Example 3: A cyclist training for a marathon can generate multiple paths of some

distance he could travel from his home as part of his regime.

Example 4: When road disturbances occur (i.e. construction, accidents, etc.), the Department of Transportation can use MAPMe to generate all alternate paths to route destinations to find detours.

IV. Code Snippet

The following code creates a simple map comprised of two buildings, the user's apartment and Chipotle restaurant. A road object is also defined, part of Broadway Avenue, which passes along these two buildings. The user is able to calculate the distance from their apartment to the Chipotle provided they give the longitude and latitude points of each object.

*Note: MAPMe uses the ~ to denote a comment which also ends with a ~

```
Map myMap = build Map(100, 100); ~this creates a map size of 100x100 grid~

~Creates the starting point of the portion Broadway Avenue to be represented in the map~
Point startBroadwayAve = new Point(40.793896,-73.972406);

~Creates the ending point of the portion Broadway Avenue to be represented in the map~
Point endBroadwayAve = new Point(40.807991,-73.963829);

~Creates and adds the two points to an Array of type Point~
Array<Point>[2] allBroadwayPoints = new Array<Point>[2];

~Calls a built in function that connect the points and establishes the road~
allBroadwayPoints.add(startBroadwayAve);
allBroadwayPoints.add(endBroadwayAve);

~Creates a road type with a name attribute and the array of points to connect~
```

Road broadwayStreet = build Road("Broadway Ave", allBroadwayPoints);

~Creates two building objects with corresponding names and positions~
Object chipotle = build Object("Chipotle", 40.798737, -73.970947);
Object myApartment = build Object("Home" , 40.808417,-73.963737);

~calculates distance from apartment to Chipotle and prints distance to screen~
double distanceToChipotle = myApartment.getDistanceTo(chipotle);

display "The distance between my apartment and Chipotle is: " + distanceToChipotle
+ "miles";