KAREL

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Initially, I read the Karel book and tried to understand the working principle of Karel then I started writing the code and I used Stepwise Refinement idea to divide the problem through some functions.

I created “PutBeepersInTheCorrectPlace(Levels)” function.

This function Splited the problem to three levels:

In the first Level, I created “PutOddOutsideSpots()” function the beepers in the odd outside spots through using “PickAndPutBeeper()” function that is also collecting the beepers that not be in the correct place.

Then it is collected beepers present in the map through certain pattern

Karel knows where beepers present on the map, so it is trying to use shortest distance in this level.

Then return to Point origin using “ReturnPointOrigin()” in this function it is trying to move On the edge of the map.

In the Second Level, I created “PutEvenSpots()” in this function the beeper is placed in the Even Spots through using “CheckEvenAndPutBeeper()“ in this function If was the total value of the index x and the index y is equals an even number put beeper otherwise didn’t put beeper.

Then it is collected beepers present on the map through another certain pattern

In this state it will move on each place in the map because the beepers present in each row so it will check everywhere in the map if there is a beeper it will pick.

Finally, In the Third Level

I created “DivideTheMap()” in this function I used algorithm in order to determine The middle of the map using “MoveSpecificLocation(int numbermoves)”

the algorithm is division by 2 if was value of Max index even or division by 2 and addition by 1 if was Max index odd.

if was value of Max index an even number it will select two Colum and fill them up by beepers or if it was value of index odd it will select one Colum and fill it up by beepers.

Then it is collected beepers present on the map through another certain pattern.

In this state it will move to columns and rows Where there are beepers using the same algorithm that I mentioned above.