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10086

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Problem Chosen

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F4 _____

2018
MCM/ICM
Summary Sheet

How many languages

Summary

With the development of globalization, people get to know more about other tongues, so the research about the language rises. Recently, a multinational service company wants to expand to be more international and have employees who can speak different several languages. For this sake it needs to know the trends of global languages and wants to get advice about new offices's locations.

In order to predict how languages of the world may vary over time, we build a prediction model, using data we collected from Twitter and other sources. Use this model, we predict the trends of native speakers and total language speaks in the next 50 years and find that

Based on the result our model produces, we use K-means algorithm to help us locate the best place for the company's global offices, taking the population and location of capital of every country into account. And we compare our recommendations with the global office choosen by world top 500 to verify our method and get great results.

How many languages

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February 9, 2018

Summary

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Keywords: K-means

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1 Introduction

1.1 Background

1.2 Restatement of the Problem

We are required to build a model to predict the trends of global languages, including the number of speakers and the geographic distribution change of the top-10 languages. Then we need to decide where the new international offices of the company should be located, or take efforts to reduce the number of offices.

2 Basic Assumptions

2.1 Assumption 1.

We assume that the land area of every country doesn't change during the period of time we study.

2.2 Assumption 2.

We ignore unpredictable or low-probability events that may cause great impact to languages trends.

3 Analysis of the Problem

4 Models and Methodology

5 The Model Results

6 Validating the Model

7 Conclusions

8 A Summary

9 Evaluate of the Mode

10 Strengths and weaknesses

10.1 Strengths

- **Applies widely**

This system can be used for many types of airplanes, and it also solves the interference during the procedure of the boarding airplane, as described above we can get to the optimization boarding time. We also know that all the service is automate.

- **Improve the quality of the airport service**

Balancing the cost of the cost and the benefit, it will bring in more convenient for airport and passengers. It also saves many human resources for the airline.

-

References

- [1] D. E. KNUTH The \TeX book the American Mathematical Society and Addison-Wesley Publishing Company , 1984-1986.
- [2] Lamport, Leslie, \LaTeX : " A Document Preparation System ", Addison-Wesley Publishing Company, 1986.
- [3] <http://www.latexstudio.net/>
- [4] <http://www.chinatex.org/>

Appendices

Appendix A First appendix

Aliquam lectus. Vivamus leo. Quisque ornare tellus ullamcorper nulla. Mauris porttitor pharetra tortor. Sed fringilla justo sed mauris. Mauris tellus. Sed non leo. Nullam elementum, magna in cursus sodales, augue est scelerisque sapien, venenatis congue nulla arcu et pede. Ut suscipit enim vel sapien. Donec congue. Maecenas urna mi, suscipit in, placerat ut, vestibulum ut, massa. Fusce ultrices nulla et nisl.

Here are simulation programmes we used in our model as follow.

Input matlab source:

```
function [t,seat,aisle]=OI6Sim(n,target,seated)
pab=rand(1,n);
for i=1:n
    if pab(i)<0.4
        aisleTime(i)=0;
    else
        aisleTime(i)=trirnd(3.2,7.1,38.7);
    end
end
end
```

Appendix B Second appendix

some more text **Input C++ source:**

```
//=====
// Name      : Sudoku.cpp
// Author     : wzlf11
// Version    : a.0
// Copyright  : Your copyright notice
// Description : Sudoku in C++.
//=====

#include <iostream>
#include <cstdlib>
#include <ctime>

using namespace std;

int table[9][9];

int main() {

    for(int i = 0; i < 9; i++){
        table[0][i] = i + 1;
    }

    srand((unsigned int)time(NULL));

    shuffle((int *)&table[0], 9);
```

```
while(!put_line(1))
{
    shuffle((int *)&table[0], 9);
}

for(int x = 0; x < 9; x++){
    for(int y = 0; y < 9; y++){
        cout << table[x][y] << " ";
    }

    cout << endl;
}

return 0;
}
```
