

Team Number:	2020XXXXXXXXXX
Problem Chosen:	A

2020 APMCM summary sheet

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Keywords: Keywords1 Keywords2 Keywords3

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I. Introduction

In order to indicate the origin of problems, the following background is worth mentioning.

$$\int_1^2 x dx$$

1.1

1.2

1.3

II. The Description of the Problem

2.1 How do we approximate the whole course of ?

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2.2 How do we define the optimal configuration?

- 1) From the perspective of :
- 2) From the perspective of the :
- 3) Compromise:

2.3 The local optimization and the overall optimization

-
-
- Virtually:

2.4 The differences in weights and sizes of

2.5 What if there is no data available?

III. Models

3.1 Basic Model

3.1.1 *Terms, Definitions and Symbols*

The signs and definitions are mostly generated from queuing theory.

3.1.2 *Assumptions*

3.1.3 *The Foundation of Model*

1) The utility function

- The cost of :
- The loss of :
- The weight of each aspect:
- Compromise:

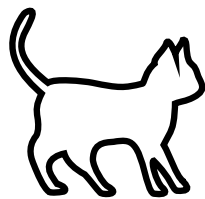


Figure 1 关注我们公众号，学习更多知识

3) The overall optimization and the local optimization

- The overall optimization:
- The local optimization:
- The optimal number of :

3.1.4 *Solution and Result*

1) The solution of the integer programming: 2) Results:

3.1.5 *Analysis of the Result*

- Local optimization and overall optimization:
- Sensitivity: The result is quite sensitive to the change of the three parameters
-
- Trend:
- Comparison:

3.1.6 *Strength and Weakness*

Strength: The Improved Model aims to make up for the neglect of . The result seems to declare that this model is more reasonable than the Basic Model and much more effective than the existing design.

Weakness: Thus the model is still an approximate on a large scale. This has doomed to limit the applications of it.

IV. Conclusions

4.1 Conclusions of the problem

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4.2 Methods used in our models

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-
-

4.3 Applications of our models

-
-
-
-

V. Future Work

5.1 Another model

5.1.1 *The limitations of queuing theory*

5.1.2

5.1.3

5.1.4

VI. References

- [1] Author, Title, Place of Publication: Press, Year of publication.
- [2] author, paper name, magazine name, volume number: starting and ending page number, year of publication.
- [3] author, resource title, web site, visit time (year, month, day).
- [4] L^AT_EX资源和技巧学习 <https://www.latexstudio.net>
- [5] L^AT_EX问题交流网站 <https://wenda.latexstudio.net>
- [6] 模板库维护 <https://github.com/latexstudio/APMCMThesis>

VII. Appendix

Listing 1: The matlab Source code of Algorithm

```

kk=2; [mdd, ndd]=size(dd);
while ~isempty(V)
    [tmpd, j]=min(W(i, V)); tmpj=V(j);
    for k=2:ndd
        [tmp1, jj]=min(dd(1, k)+W(dd(2, k), V));
        tmp2=V(jj); tt(k-1, :)= [tmp1, tmp2, jj];
    end
    tmp=[tmpd, tmpj, j; tt]; [tmp3, tmp4]=min(tmp(:, 1));
    if tmp3==tmpd, ss(1:2, kk)=[i; tmp(tmp4, 2)];
    else, tmp5=find(ss(:, tmp4)~=0); tmp6=length(tmp5);
    if dd(2, tmp4)==ss(tmp6, tmp4)
        ss(1:tmp6+1, kk)=[ss(tmp5, tmp4); tmp(tmp4, 2)];
    else, ss(1:3, kk)=[i; dd(2, tmp4); tmp(tmp4, 2)];
    end; end
    dd=[dd, [tmp3; tmp(tmp4, 2)]]; V(tmp(tmp4, 3))=[];
    [mdd, ndd]=size(dd); kk=kk+1;
end; S=ss; D=dd(1, :);

```

Listing 2: The lingo source code

```

kk=2;
[mdd, ndd]=size(dd);
while ~isempty(V)
    [tmpd, j]=min(W(i, V)); tmpj=V(j);
    for k=2:ndd
        [tmp1, jj]=min(dd(1, k)+W(dd(2, k), V));
        tmp2=V(jj); tt(k-1, :)= [tmp1, tmp2, jj];
    end
    tmp=[tmpd, tmpj, j; tt]; [tmp3, tmp4]=min(tmp(:, 1));
    if tmp3==tmpd, ss(1:2, kk)=[i; tmp(tmp4, 2)];
    else, tmp5=find(ss(:, tmp4)~=0); tmp6=length(tmp5);
    if dd(2, tmp4)==ss(tmp6, tmp4)
        ss(1:tmp6+1, kk)=[ss(tmp5, tmp4); tmp(tmp4, 2)];
    else, ss(1:3, kk)=[i; dd(2, tmp4); tmp(tmp4, 2)];

```

```
end;  
end  
    dd=[dd,[tmp3;tmp(tmp4,2)]];V(tmp(tmp4,3))=[];  
    [mdd,ndd]=size(dd);  
    kk=kk+1;  
end;  
S=ss;  
D=dd(1,:);
```