For office use only	Team Control Number	For office use only
T1 ________________	**1911507**	F1 ________________
T2 ________________		F2 ________________
T3 ________________	Problem Chosen	F3 ________________
T4 ________________	**B**	F4 ________________

2019
MCM/ICM
Summary Sheet

The LaTeX Template for MCM Version v6.2.1

Summary

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Keywords: keyword1; keyword2

Contents

1 General Assumptions

Assumption I: DroneGo disaster response system consists of up to three ISO cargo containers, a DroneGo fleet and some emergency medical packages.

The three cargo containers are identical with standard size, designated as Container A, Container B and Container C respectively. The DroneGo fleet is a combination of drones selected from eight types of potential candidates, namely Drone A to Drone H. Only three types of emergency medical packages are available, referred to as MED 1, MED 2, and MED 3.

Assumption II: DroneGo disaster response system is designed for possible Puerto Rico hurricane disaster.

When disasters occurs, a DroneGo fleet and some emergency medical packages will be packed in up to three cargo containers first of all.

Next, each cargo container will be transported to one of the 32 populated places, which are represented by yellow square in Attachment 1, to ensure that DroneGo disaster response system can be timely discovered and well operated.

Then both drones and medical packages will be taken out of the containers, and afterwards the latter will be packed into the drone cargo bay that is in fixed connection with the drone.

Finally, all drones will depart from the up to three container locations and fly along the main roads on schedule. As is shown in Attachment 1, these main roads connect 32 populated places and make a road network. It is worth pointing out that there are two possible situations for these drones. If the drone carries a cargo bay with medical packages in it, the drone must fly via five locations in need of medical assistance: Jajardo, San Pablo, San Juan, Bayamon and Arecibo, for the purpose of offloading its cargo. However, if the drone carries no cargo, any routes without deviation of the road network are allowed.

2 Symbols and definitions

Symbol	Definition
X	The number of the containers X.
Y	The number of the containers Y.
Z	The number of the containers Z.
X_α	The number of the drones α packed in the container X.
Y_α	The number of the drones α packed in the container Y.
Z_α	The number of the drones α packed in the container Z.
$X_{\alpha ij}$	The number of the MED i transported by drone α from container X's location to the demand location j, where $\alpha = A, \cdots, H$, $i = 1, 2, 3$, $j = 1, 2, \cdots, 5$.
$Y_{\alpha ij}$	The number of the MED i transported by drone α from container Y's location to the demand location j, where $\alpha = A, \cdots, H$, $i = 1, 2, 3$, $j = 1, 2, \cdots, 5$.
$Z_{\alpha ij}$	The number of the MED i transported by drone α from container Z's location to the demand location j, where $\alpha = A, \cdots, H$, $i = 1, 2, 3$, $j = 1, 2, \cdots, 5$.
c_i	The cost of MED i, where $i = 1, 2, 3$.
C_α	The cost of Drone α, where $\alpha = A, B, \cdots, H$.
W	The cost of the container.
V_α	The volume of the drone α, where $\alpha = A, B, \cdots, H$.
v_i	The volume of the medical package i, where $i = 1, 2, 3$.
P_α	The max payload capability of the drone α, where $\alpha = A, B, \cdots, H$.
d	The supporting days for the medical package demand of all 5 locations.
M	A sufficiently large number for big-M method in integer programming.

Symbol	Definition
R	A parameter indicating the significance of the video reconnaissance of road networks compared to medical supply delivery.
l_α	The max flight distance of the drone α.
T	The number of the nodes in the network.
U_{Xm}	$U_{Xm}=1$ if container X is located at node m, where $m=1,2,\cdots,T$. Otherwise $U_{Xm}=0$.
U_{Ym}	$U_{Ym}=1$ if container Y is located at node m, where $m=1,2,\cdots,T$. Otherwise $U_{Ym}=0$.
U_{Xm}	$U_{Zm}=1$ if container Z is located at node m, where $m=1,2,\cdots,T$. Otherwise $U_{Zm}=0$.
$f(m,j)$	The length of the shortest path from node m to node j.

3 Model 1

X: The number of the containers X.

Y: The number of the containers Y.

Z: The number of the containers Z.

X_α: The number of the drones α packed in the container X.

Y_α: The number of the drones α packed in the container Y.

Z_α: The number of the drones α packed in the container Z.

$X_{\alpha ij}$: The number of the MED i transported by drone α from container X's location to the demand location j, where $\alpha=A,B,\cdots,H$, $i=1,2,3$, $j=1,2\cdots,5$.

$Y_{\alpha ij}$: The number of the MED i transported by drone α from container Y's location to the demand location j, where $\alpha=A,B,\cdots,H$, $i=1,2,3$, $j=1,2\cdots,5$.

$Z_{\alpha ij}$: The number of the MED i transported by drone α from container Z's location to the demand location j, where $\alpha=A,B,\cdots,H$, $i=1,2,3$, $j=1,2\cdots,5$.

c_i: The cost of the medical package i, where $i=1,2,3$.

C_α: The cost of the drone α, where $\alpha=A,B,\cdots,H$.

W: The cost of the container.

V_α: The volume of the drone α, where $\alpha=A,B,\cdots,H$.

v_i: The volume of the medical package i, where $i=1,2,3$.

P_α: The max payload capability of the drone α, where $\alpha = A, B, \cdots, H$.

d: The supporting days for the medical package demand of all 5 locations.

M: A sufficiently large number for big-M method in integer programming.

$$\min \quad \sum_{\alpha=A}^{H} \sum_{i=1}^{3} \sum_{j=1}^{5} c_i \left(X_{\alpha ij} + Y_{\alpha ij} + Z_{\alpha ij} \right) + \sum_{\alpha=A}^{H} C_\alpha \left(X_\alpha + Y_\alpha + Z_\alpha \right) + W(X + Y + Z)$$

or

$$\max \quad d$$

$$
\text{s.t.}\begin{cases}
\sum_{i=1}^{3}\sum_{j=1}^{5} v_i X_{\alpha ij} \le 8\times 10\times 14 \ \text{ if } \alpha = A, B, D & (1)\\
\sum_{i=1}^{3}\sum_{j=1}^{5} v_i X_{\alpha ij} \le 24\times 20\times 20 \ \text{ if } \alpha = C, E, F, G & (2)\\
\sum_{i=1}^{3}\sum_{j=1}^{5} v_i Y_{\alpha ij} \le 8\times 10\times 14 \ \text{ if } \alpha = A, B, D & (3)\\
\sum_{i=1}^{3}\sum_{j=1}^{5} v_i Y_{\alpha ij} \le 24\times 20\times 20 \ \text{ if } \alpha = C, E, F, G & (4)\\
\sum_{i=1}^{3}\sum_{j=1}^{5} v_i Z_{\alpha ij} \le 8\times 10\times 14 \ \text{ if } \alpha = A, B, D & (5)\\
\sum_{i=1}^{3}\sum_{j=1}^{5} v_i Z_{\alpha ij} \le 24\times 20\times 20 \ \text{ if } \alpha = C, E, F, G & (6)\\
\sum_{\alpha=A}^{H} V_\alpha X_\alpha + \sum_{\alpha=A}^{H}\sum_{i=1}^{3}\sum_{j=1}^{5} v_i X_{\alpha ij} \le 231\times 92\times 94 & (7)\\
\sum_{\alpha=A}^{H} V_\alpha Y_\alpha + \sum_{\alpha=A}^{H}\sum_{i=1}^{3}\sum_{j=1}^{5} v_i Y_{\alpha ij} \le 231\times 92\times 94 & (8)\\
\sum_{\alpha=A}^{H} V_\alpha Z_\alpha + \sum_{\alpha=A}^{H}\sum_{i=1}^{3}\sum_{j=1}^{5} v_i Z_{\alpha ij} \le 231\times 92\times 94 & (9)\\
\sum_{i=1}^{3}\sum_{j=1}^{5} X_{\alpha ij} \le M X_\alpha \ \text{ for } \alpha = A, B, \cdots, G & (10)\\
\sum_{i=1}^{3}\sum_{j=1}^{5} Y_{\alpha ij} \le M X_\alpha \ \text{ for } \alpha = A, B, \cdots, G & (11)\\
\sum_{i=1}^{3}\sum_{j=1}^{5} Z_{\alpha ij} \le M X_\alpha \ \text{ for } \alpha = A, B, \cdots, G & (12)\\
\sum_{\alpha=A}^{H} X_\alpha \le MX & (13)\\
\sum_{\alpha=A}^{H} Y_\alpha \le MY & (14)\\
\sum_{\alpha=A}^{H} Z_\alpha \le MZ & (15)\\
X \le 1 & (16)\\
Y \le 1 & (17)\\
Z \le 1 & (18)\\
\sum_{j=1}^{5} (2X_{\alpha 1j} + 2X_{\alpha 2j} + 3X_{\alpha 3j}) \le P_\alpha \text{ for } \alpha = A, B, \cdots, G & (19)\\
\sum_{j=1}^{5} (2Y_{\alpha 1j} + 2Y_{\alpha 2j} + 3Y_{\alpha 3j}) \le P_\alpha \text{ for } \alpha = A, B, \cdots, G & (20)\\
\sum_{j=1}^{5} (2Z_{\alpha 1j} + 2Z_{\alpha 2j} + 3Z_{\alpha 3j}) \le P_\alpha \text{ for } \alpha = A, B, \cdots, G & (21)
\end{cases}
$$

$$
\text{s.t.}\begin{cases}
\sum_{\alpha=A}^{H}(X_{\alpha 11}+Y_{\alpha 11}+Z_{\alpha 11})\geq d & (22)\\
\sum_{\alpha=A}^{H}(X_{\alpha 31}+Y_{\alpha 31}+Z_{\alpha 31})\geq d & (23)\\
\sum_{\alpha=A}^{H}(X_{\alpha 12}+Y_{\alpha 12}+Z_{\alpha 12})\geq 2d & (24)\\
\sum_{\alpha=A}^{H}(X_{\alpha 32}+Y_{\alpha 32}+Z_{\alpha 32})\geq d & (25)\\
\sum_{\alpha=A}^{H}(X_{\alpha 13}+Y_{\alpha 13}+Z_{\alpha 13})\geq d & (26)\\
\sum_{\alpha=A}^{H}(X_{\alpha 23}+Y_{\alpha 23}+Z_{\alpha 23})\geq d & (27)\\
\sum_{\alpha=A}^{H}(X_{\alpha 14}+Y_{\alpha 14}+Z_{\alpha 14})\geq 2d & (28)\\
\sum_{\alpha=A}^{H}(X_{\alpha 24}+Y_{\alpha 24}+Z_{\alpha 24})\geq d & (29)\\
\sum_{\alpha=A}^{H}(X_{\alpha 34}+Y_{\alpha 34}+Z_{\alpha 34})\geq 2d & (30)\\
\sum_{\alpha=A}^{H}(X_{\alpha 15}+Y_{\alpha 15}+Z_{\alpha 15})\geq d & (31)\\
X,Y,Z,X_\alpha,Y_\alpha,Z_\alpha,X_{\alpha ij},Y_{\alpha ij},Z_{\alpha ij}\text{ are nonnegative integers.} & (32)
\end{cases}
$$

4 Model 2

R: A parameter indicating the significance of the video reconnaissance of road networks compared to medical supply delivery.

l_α: The max flight distance of the drone α.

T: The number of the nodes in the network.

U_{Xm}: $U_{Xm}=1$ if container X is located at node m, where $m=1,2,\cdots,T$. Otherwise $U_{Xm}=0$.

U_{Ym}: $U_{Ym}=1$ if container Y is located at node m, where $m=1,2,\cdots,T$. Otherwise $U_{Ym}=0$.

U_{Xm}: $U_{Zm}=1$ if container Z is located at node m, where $m=1,2,\cdots,T$. Otherwise $U_{Zm}=0$.

$f(m,j)$: The length of the shortest path from node m to node j.

$$
\begin{aligned}
\min \quad & \sum_{\alpha=A}^{H}\sum_{i=1}^{3}\sum_{j=1}^{5} c_i\left(X_{\alpha ij}+Y_{\alpha ij}+Z_{\alpha ij}\right)+\sum_{\alpha=A}^{H} C_\alpha\left(X_\alpha+Y_\alpha+Z_\alpha\right)+W(X+Y+Z) \\
& - R\sum_{\substack{\alpha=A\\ \alpha\neq F}}^{G} l_\alpha(X_\alpha+Y_\alpha+Z_\alpha)
\end{aligned}
$$

Additional constraints:

$$
\text{s.t.}\begin{cases}
\sum\limits_{m=1}^{T} U_{Xm}=1\\
\sum\limits_{m=1}^{T} U_{Ym}=1\\
\sum\limits_{m=1}^{T} U_{Zm}=1\\
\sum\limits_{i=1}^{3} X_{\alpha ij}\leq M(1-U_{Xm}) \text{ if } l_\alpha<f(m,j),\ \text{for } \alpha=A,\cdots,G, m=1,\cdots,T, j=1,\cdots,5\\
\sum\limits_{i=1}^{3} Y_{\alpha ij}\leq M(1-U_{Ym}) \text{ if } l_\alpha<f(m,j),\ \text{for } \alpha=A,\cdots,G, m=1,\cdots,T, j=1,\cdots,5\\
\sum\limits_{i=1}^{3} Z_{\alpha ij}\leq M(1-U_{Zm}) \text{ if } l_\alpha<f(m,j),\ \text{for } \alpha=A,\cdots,G, m=1,\cdots,T, j=1,\cdots,5\\
U_{Xm},U_{Ym},U_{Zm}\in\{0,1\}
\end{cases}
$$

5 Introduction

Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.

- minimizes the discomfort to the hands, or
- maximizes the outgoing velocity of the ball.

We focus exclusively on the second definition.

- the initial velocity and rotation of the ball,
- the initial velocity and rotation of the bat,
- the relative position and orientation of the bat and ball, and

- the force over time that the hitter hands applies on the handle.

Nulla malesuada porttitor diam. Donec felis erat, congue non, volutpat at, tincidunt tristique, libero. Vivamus viverra fermentum felis. Donec nonummy pellentesque ante. Phasellus adipiscing semper elit. Proin fermentum massa ac quam. Sed diam turpis, molestie vitae, placerat a, molestie nec, leo. Maecenas lacinia. Nam ipsum ligula, eleifend at, accumsan nec, suscipit a, ipsum. Morbi blandit ligula feugiat magna. Nunc eleifend consequat lorem. Sed lacinia nulla vitae enim. Pellentesque tincidunt purus vel magna. Integer non enim. Praesent euismod nunc eu purus. Donec bibendum quam in tellus. Nullam cursus pulvinar lectus. Donec et mi. Nam vulputate metus eu enim. Vestibulum pellentesque felis eu massa.

- the angular velocity of the bat,
- the velocity of the ball, and
- the position of impact along the bat.

Quisque ullamcorper placerat ipsum. Cras nibh. Morbi vel justo vitae lacus tincidunt ultrices. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. In hac habitasse platea dictumst. Integer tempus convallis augue. Etiam facilisis. Nunc elementum fermentum wisi. Aenean placerat. Ut imperdiet, enim sed gravida sollicitudin, felis odio placerat quam, ac pulvinar elit purus eget enim. Nunc vitae tortor. Proin tempus nibh sit amet nisl. Vivamus quis tortor vitae risus porta vehicula.

center of percussion [Brody 1986], Fusce mauris. Vestibulum luctus nibh at lectus. Sed bibendum, nulla a faucibus semper, leo velit ultricies tellus, ac venenatis arcu wisi vel nisl. Vestibulum diam. Aliquam pellentesque, augue quis sagittis posuere, turpis lacus congue quam, in hendrerit risus eros eget felis. Maecenas eget erat in sapien mattis porttitor. Vestibulum porttitor. Nulla facilisi. Sed a turpis eu lacus commodo facilisis. Morbi fringilla, wisi in dignissim interdum, justo lectus sagittis dui, et vehicula libero dui cursus dui. Mauris tempor ligula sed lacus. Duis cursus enim ut augue. Cras ac magna. Cras nulla. Nulla egestas. Curabitur a leo. Quisque egestas wisi eget nunc. Nam feugiat lacus vel est. Curabitur consectetuer.

Theorem 5.1. *LaTeX*

Lemma 5.2. *TeX.*

Proof. The proof of theorem. □

5.1 Other Assumptions

Suspendisse vel felis. Ut lorem lorem, interdum eu, tincidunt sit amet, laoreet vitae, arcu. Aenean faucibus pede eu ante. Praesent enim elit, rutrum at, molestie non, nonummy vel, nisl. Ut lectus eros, malesuada sit amet, fermentum eu, sodales cursus, magna. Donec eu purus. Quisque vehicula, urna sed ultricies auctor, pede lorem egestas dui, et convallis elit erat sed nulla. Donec luctus. Curabitur et nunc. Aliquam dolor odio, commodo pretium, ultricies non, pharetra in, velit. Integer arcu est, nonummy in, fermentum faucibus, egestas vel, odio.

-
-
-
-

Sed commodo posuere pede. Mauris ut est. Ut quis purus. Sed ac odio. Sed vehicula hendrerit sem. Duis non odio. Morbi ut dui. Sed accumsan risus eget odio. In hac habitasse platea dictumst. Pellentesque non elit. Fusce sed justo eu urna porta tincidunt. Mauris felis odio, sollicitudin sed, volutpat a, ornare ac, erat. Morbi quis dolor. Donec pellentesque, erat ac sagittis semper, nunc dui lobortis purus, quis congue purus metus ultricies tellus. Proin et quam. Class aptent taciti sociosqu ad litora torquent per conubia nostra, per inceptos hymenaeos. Praesent sapien turpis, fermentum vel, eleifend faucibus, vehicula eu, lacus.

6 Analysis of the Problem

Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Donec odio elit, dictum in, hendrerit sit amet, egestas sed, leo. Praesent feugiat sapien aliquet odio. Integer vitae justo. Aliquam vestibulum fringilla lorem. Sed neque lectus, consectetuer at, consectetuer sed, eleifend ac, lectus. Nulla facilisi. Pellentesque eget lectus. Proin eu metus. Sed porttitor. In hac habitasse platea dictumst. Suspendisse eu lectus. Ut mi mi, lacinia sit amet, placerat et, mollis vitae, dui. Sed ante tellus, tristique ut, iaculis eu, malesuada ac, dui. Mauris nibh leo, facilisis non, adipiscing quis, ultrices a, dui.

(1)

$$a^2 \tag{1}$$

$$\begin{pmatrix} *20ca_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{pmatrix} = \frac{Opposite}{Hypotenuse} \cos^{-1}\theta \arcsin\theta$$

Morbi luctus, wisi viverra faucibus pretium, nibh est placerat odio, nec commodo wisi enim eget quam. Quisque libero justo, consectetuer a, feugiat vitae, porttitor eu, libero. Suspendisse sed mauris vitae elit sollicitudin malesuada. Maecenas ultricies

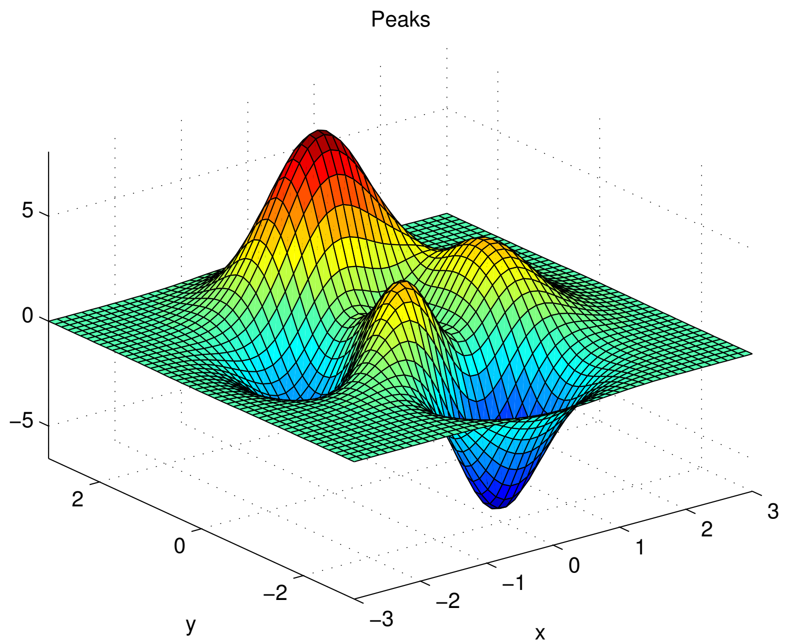

Figure 1: aa

eros sit amet ante. Ut venenatis velit. Maecenas sed mi eget dui varius euismod. Phasellus aliquet volutpat odio. Vestibulum ante ipsum primis in faucibus orci luctus et ultrices posuere cubilia Curae; Pellentesque sit amet pede ac sem eleifend consectetuer. Nullam elementum, urna vel imperdiet sodales, elit ipsum pharetra ligula, ac pretium ante justo a nulla. Curabitur tristique arcu eu metus. Vestibulum lectus. Proin mauris. Proin eu nunc eu urna hendrerit faucibus. Aliquam auctor, pede consequat laoreet varius, eros tellus scelerisque quam, pellentesque hendrerit ipsum dolor sed augue. Nulla nec lacus.

$$p_j = \begin{cases} 0, & \text{if } j \text{ is odd} \\ r!\,(-1)^{j/2}, & \text{if } j \text{ is even} \end{cases}$$

Suspendisse vitae elit. Aliquam arcu neque, ornare in, ullamcorper quis, commodo eu, libero. Fusce sagittis erat at erat tristique mollis. Maecenas sapien libero, molestie et, lobortis in, sodales eget, dui. Morbi ultrices rutrum lorem. Nam elementum ullamcorper leo. Morbi dui. Aliquam sagittis. Nunc placerat. Pellentesque tristique sodales est. Maecenas imperdiet lacinia velit. Cras non urna. Morbi eros pede, suscipit ac, varius vel, egestas non, eros. Praesent malesuada, diam id pretium elementum, eros sem dictum tortor, vel consectetuer odio sem sed wisi.

$$\arcsin\theta = \oiiint_{\varphi} \lim_{x\to\infty} \frac{n!}{r!\,(n-r)!} \tag{1}$$

7 Calculating and Simplifying the Model

Sed feugiat. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Ut pellentesque augue sed urna. Vestibulum diam eros, fringilla et, consectetuer eu, nonummy id, sapien. Nullam at lectus. In sagittis ultrices mauris. Curabitur malesuada erat sit amet massa. Fusce blandit. Aliquam erat volutpat. Aliquam euismod. Aenean vel lectus. Nunc imperdiet justo nec dolor.

8 The Model Results

Suspendisse vel felis. Ut lorem lorem, interdum eu, tincidunt sit amet, laoreet vitae, arcu. Aenean faucibus pede eu ante. Praesent enim elit, rutrum at, molestie non, nonummy vel, nisl. Ut lectus eros, malesuada sit amet, fermentum eu, sodales cursus, magna. Donec eu purus. Quisque vehicula, urna sed ultricies auctor, pede lorem egestas dui, et convallis elit erat sed nulla. Donec luctus. Curabitur et nunc. Aliquam dolor odio, commodo pretium, ultricies non, pharetra in, velit. Integer arcu est, nonummy in, fermentum faucibus, egestas vel, odio.

9 Validating the Model

Morbi luctus, wisi viverra faucibus pretium, nibh est placerat odio, nec commodo wisi enim eget quam. Quisque libero justo, consectetuer a, feugiat vitae, porttitor eu, libero. Suspendisse sed mauris vitae elit sollicitudin malesuada. Maecenas ultricies eros sit amet ante. Ut venenatis velit. Maecenas sed mi eget dui varius euismod. Phasellus aliquet volutpat odio. Vestibulum ante ipsum primis in faucibus orci luctus et ultrices posuere cubilia Curae; Pellentesque sit amet pede ac sem eleifend consectetuer. Nullam elementum, urna vel imperdiet sodales, elit ipsum pharetra ligula, ac pretium ante justo a nulla. Curabitur tristique arcu eu metus. Vestibulum lectus. Proin mauris. Proin eu nunc eu urna hendrerit faucibus. Aliquam auctor, pede consequat laoreet varius, eros tellus scelerisque quam, pellentesque hendrerit ipsum dolor sed augue. Nulla nec lacus.

10 Conclusions

Suspendisse vel felis. Ut lorem lorem, interdum eu, tincidunt sit amet, laoreet vitae, arcu. Aenean faucibus pede eu ante. Praesent enim elit, rutrum at, molestie non, nonummy vel, nisl. Ut lectus eros, malesuada sit amet, fermentum eu, sodales cursus, magna. Donec eu purus. Quisque vehicula, urna sed ultricies auctor, pede lorem egestas dui, et convallis elit erat sed nulla. Donec luctus. Curabitur et nunc. Aliquam dolor odio, commodo pretium, ultricies non, pharetra in, velit. Integer arcu est, nonummy in, fermentum faucibus, egestas vel, odio.

11 A Summary

Suspendisse vel felis. Ut lorem lorem, interdum eu, tincidunt sit amet, laoreet vitae, arcu. Aenean faucibus pede eu ante. Praesent enim elit, rutrum at, molestie non, nonummy vel, nisl. Ut lectus eros, malesuada sit amet, fermentum eu, sodales cursus, magna. Donec eu purus. Quisque vehicula, urna sed ultricies auctor, pede lorem egestas dui, et convallis elit erat sed nulla. Donec luctus. Curabitur et nunc. Aliquam dolor odio, commodo pretium, ultricies non, pharetra in, velit. Integer arcu est, nonummy in, fermentum faucibus, egestas vel, odio.

12 Evaluate of the Mode

13 Strengths and weaknesses

Etiam euismod. Fusce facilisis lacinia dui. Suspendisse potenti. In mi erat, cursus id, nonummy sed, ullamcorper eget, sapien. Praesent pretium, magna in eleifend egestas, pede pede pretium lorem, quis consectetuer tortor sapien facilisis magna. Mauris quis magna varius nulla scelerisque imperdiet. Aliquam non quam. Aliquam porttitor quam a lacus. Praesent vel arcu ut tortor cursus volutpat. In vitae pede quis diam bibendum placerat. Fusce elementum convallis neque. Sed dolor orci, scelerisque ac, dapibus nec, ultricies ut, mi. Duis nec dui quis leo sagittis commodo.

13.1 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.

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References

[1] D. E. KNUTH The TEXbook 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
```

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;
}
```