**Machine Scheduling Optimizer**

User Manual

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**SYSTEM OVERVIEW**

Our Machine Scheduling Optimizer is mainly targeting manufacturing area. While in this demonstration we cover a basic manufacturing process, our system can easily be extended and customized to any manufacturing process. It is a simple application that will create and plan the best machine scheduler for you to produced the desired components. The system will try to maximize your profit will creating such plan. All you need to do is just to fill in price and number of components to be produced.

**USER INTERFACE**

Our user interface runs using react js framework. Once our backend engine returns the computation of machine schedule optimization, the web application will show all the details of machine schedule process, including unit produced, profitability, and schedule visualization to help imagining the schedule process.

**RECOMMENDED BROWSERS**

The system supports the following Web Browsers:

* Internet Explorer 11
* Google Chrome Version 72 and above
* Safari Version 12 and above

**REQUIREMENTS**

* nodejs and npm should be installed. Otherwise please download and install from the following website: <https://www.npmjs.com/get-npm>
* To run the backend system, you can just run the binary file (src/go/main.exe). But it is also recommended to always install Golang version 1.12.4 or later. Please follow the installation in <https://golang.org/dl/>

**INSTALLATION AND DEPLOYMENT**

|  |
| --- |
| # 1. install all front end dependencies  cd SystemCode/comp any-order-form  npm i react-scripts  npm install  # 2. Run both web app and backend system  start\_server.sh # to start backend system  web\_app.sh # to start web app  start.sh # to run both start\_server.sh and web\_app.sh |

**SAMPLE INPUT & SYSTEM OUTPUT**

Scenario 1

|  |  |  |  |
| --- | --- | --- | --- |
| Characteristic of sales | Received order on 3 type of casings and produced all orders | | |
| Input | Quick Scan: Off   |  |  |  |  | | --- | --- | --- | --- | |  | Cost ($/unit) | Price ($/unit) | Order Received (unit) | | Samsung S9 Silicone Case (Coloured) | 1 | 3 | 1500 | | Huawei P30 Clear Case | 1 | 2 | 2000 | | Samsung Galaxy Tab A.10.1 Case | 1 | 2 | 1000 | | | |
| System output: |  | | |
| Analysis of system output | Features | Output | Explanation of system’s output |
| Profit | $4176.74 | Based on the units produced and unit profit, the factory is able to achieve the optimum profit of $4176.74 after optimizing the schedule. |
| Outstanding component | 0 | The factory is able to manufacture all the orders received within the month |
| Recommended machine schedule | Refer to the graph attached above | Based on divide and conquer method, the system recommends to carry out the manufacturing in 3 batches. |

Scenario 2

|  |  |  |  |
| --- | --- | --- | --- |
| Characteristic of sales | Received order on 3 type of casings with outstanding orders | | |
| Input | Quick Scan: Off   |  |  |  |  | | --- | --- | --- | --- | |  | Cost ($/unit) | Price ($/unit) | Order Received (unit) | | Samsung S9 Silicone Case (Coloured) | 1 | 3 | 3000 | | Huawei P30 Clear Case | 1 | 2 | 2000 | | Samsung Galaxy Tab A.10.1 Case | 1 | 2 | 1000 | | | |
| System output: |  | | |
| Analysis of system output | Features | Output | Explanation of system’s output |
| Profit | $6147.3 | Based on the units produced and unit profit, the factory is able to achieve the optimum profit of $6147.3 after optimizing the schedule. |
| Outstanding component | Samsung S9 Silicone Case (Coloured): 126 | Due to limited time and machine, 126 nos. of Samsung S9 Silicone Case (Coloured) remained as outstanding component. |
| Recommended machine schedule | Refer to the graph attached above | Based on divide and conquer method, the system recommends to carry out the manufacturing in 3 batches. |

Scenario 3

|  |  |  |  |
| --- | --- | --- | --- |
| Characteristic of sales | Received order on 5 type of casings with outstanding orders | | |
| Input | Quick Scan: On   |  |  |  |  | | --- | --- | --- | --- | |  | Cost ($/unit) | Price ($/unit) | Order Received (unit) | | Samsung S9 Silicone Case (Coloured) | 1 | 3 | 1200 | | Huawei P30 Clear Case | 1 | 2 | 800 | | Samsung Galaxy Tab A.10.1 Case | 1 | 2 | 1000 | | Microsoft Surface Pro 5 Protective Case | 1 | 4 | 700 | | Iphone X Normal Case | 1 | 5 | 500 | | Iphone XS SE Case (Gold Colour) | 2 | 4 | 1000 | | Iphone XS Colour | 2 | 5 | 600 | | Ipad Pro 12.9 Inch Case | 2 | 6 | 1000 | | | |
| System output: |  | | |
| Analysis of system output | Features | Output | Explanation of system’s output |
| Profit | $6147.3 | Based on the units produced and unit profit, the factory is able to achieve the optimum profit of $6147.3 after optimizing the schedule. |
| Outstanding component | Samsung S9 Silicone Case (Coloured): 126 | Due to limited time and machine, 126 nos. of Samsung S9 Silicone Case (Coloured) remained as outstanding component. |
| Recommended machine schedule | Refer to the graph attached above | Based on divide and conquer method, the system recommends to carry out the manufacturing in 3 batches. |