**2020 INFORMS O.R. & Analytics Student Team Competition – ENTRY FORM**

Carefully review the Entry Instructions and Judging Criteria before completing this form and submitting your entry. Use this MSWord form as a template, maintaining the section headings and replacing the explanatory text with your presentation. Use the same font style and size, margins and line spacing as used in the form. Figures, visualizations, appendices etc. should be embedded in this form, not provided as separate files. Do not exceed 30 pages, including all figures and appendices. Other editing tools, such as LaTeX, are allowed as long as you follow the structure in this Word template.

***Caution: do not include any identifying information (e.g., university name, student or advisor names, etc.) in this entry form or any other materials you are submitting.******After registration, the Team Leader will receive an Application Code; this is the entry number for your team.***

**Team Entry Number:**

**Executive Summary (not to exceed 2 pages)**

In this section, provide an executive summary for Jelly Bean Manufacturing. Your summary should briefly address your understanding of the business problem and how you approached solving it, covering not only the technical decisions and analysis but also the process your team used. The summary should also briefly describe your recommendations to Jelly Bean Manufacturing.

**Team Makeup & Process**

Without providing the names of individuals, describe the makeup of your team and the process your team used in working on the problem. This may include team members’ background and experience, particularly as they may relate to the role each member played in the project. In addition, describe the process your team used, including elements such as how the work was allocated, how the team demonstrated the value of team members’ ideas, how work from individuals was synthesized into the final analysis. You can also address any challenges and learnings from the team experience.

**Framing the Problem**

Describe your understanding of the business problem presented by Jelly Bean Manufacturing through the written problem statement, the webinar and other interaction with the competition sponsor, and their answers to questions posed by teams. Then explain how your team analyzed the requirements and determined the goal of the analysis. This may include determining which constraints to analyze, as well as defining a set of assumptions and key metrics of success.

**Data**

Data for the problem was provided by the sponsor of the competition. If you used other data or sources, please define them here. Describe any work your team may have done with the data itself, such as rescaling, cleaning, identifying relationships, etc. If your analysis of the data helped to refine your understanding of the business and/or analytics problem, describe that here.

**Methodology Approach & Model Building**

In this section, describe the decision-making process for selecting an analytics methodology(ies). What other methodologies did your team consider and what were the reasons for the final selection? You may want to include discussion and considerations—such as the assumptions that were made, the scope and early considerations—to provide a useful framing for your selection. You must list any changes to or deviations from costs, business rules, or assumptions that were provided, and provide an explanation. Describe and document the chosen methodology and model in sufficient detail and clarity that it can be understood and evaluated. Your selection of software should also be addressed here. Given the multi-disciplinary nature of the problem, background information may be useful to include or reference. You may want to discuss the scalability of the model as the number of facilities and products increases.

**Analytics Solution and Results**

In accordance with your methodology and models, present your analytics solution and results using these guidelines:

* Performance Summary: Present the performance summary in this section, e.g., describing the transportation amounts, production amounts, associated costs, and percentage demand fulfilled (expected values aggregated over the product groups), as well as operational bottlenecks. Specific tables that should be part of your report are listed below.

Table for transportation amounts/costs:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Green Bay | Omaha | Springfield | Columbus | Detroit |
| Green Bay |  | X lbs / $ Y |  |  |  |
| Omaha |  |  |  |  |  |
| Springfield |  |  |  |  |  |
| Columbus |  |  |  |  |  |
| Detroit |  |  |  |  |  |

Table for production amounts, days, and costs:

|  |  |  |  |
| --- | --- | --- | --- |
| Manufacturing Site | Total Production (lbs) | Total number of days to complete production | Total Production Cost ($) |
| Green Bay |  |  |  |
| Omaha |  |  |  |
| Springfield |  |  |  |
| Columbus |  |  |  |
| Detroit |  |  |  |

Table for determining the bottlenecks at each site:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Manufacturing Site | Classifier  (Utilization) | Pre-finish Operation  (Utilization) | Pack Operation  (Utilization) | Bottleneck  (Operation name) |
| Green Bay |  |  |  |  |
| Omaha |  |  |  |  |
| Springfield |  |  |  |  |
| Columbus |  |  |  |  |
| Detroit |  |  |  |  |

* More detailed results: Report the inventory levels of the products (per location and per color) following the format of the tables given below. Upload these tables as separate CSV files with your submission. You can report a more compact summary/visualization of these results in this Entry Form.

Table for Inventory at each site by color prior to start of operations on April 1st after shipping.

|  |  |  |
| --- | --- | --- |
| Location | Color  (Coloring agents 1-40) | Quantity in Pounds  In RMI bins |
| Green Bay | Color Agent 1 |  |
| Omaha | Color Agent 1 |  |
| Springfield | Color Agent 1 |  |
| Columbus | Color Agent 1 |  |
| Detroit | Color Agent 1 |  |
| …. | …. |  |

Table for the inventory balance from the start to Packaging operation by site.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Location | Color  (Coloring agents 1-40) | Quantity in Pounds  At classifier | Quantity in Pounds  At Pre-finish Operations  (Group by size, flavor) | Quantity in Pounds  At Pack Operations  (Group by size, flavor, packaging type) |
| Green Bay | Color Agent 1 |  |  |  |
| Omaha | Color Agent 1 |  |  |  |
| Springfield | Color Agent 1 |  |  |  |
| Columbus | Color Agent 1 |  |  |  |
| Detroit | Color Agent 1 |  |  |  |
| …. | …. |  |  |  |

* Additional Results: You may supplement your analysis, for example for individual product groups, with additional charts, diagrams and/or other visualization in this section of the Entry Form.
* Insights for JB Manufacturing Executive Team: Any insights or recommendations you have uncovered as part of this assignment – you can think big and broad (limit to 500 words).
* Results Template: Populate and submit your solution and results using the Results Template in CSV. The template is provided on the Competition download site.

**References**

Please follow guidelines in the *Chicago Manual of Style,* 16th Edition. Here are examples:

* Journal article: Flynn J, Gartska SK (1990) A dynamic inventory model with periodic auditing. *Oper. Res.* 38(6):1089–1103.
* Book: Makridakis S, Wheelwright SC, McGee VE (1983) *Forecasting: Methods and Applications*, 2nd ed. (John Wiley & Sons, New York).
* Edited Book: Martello S, Toth P (1979) The 0-1 knapsack problem. Christofides N, Mingozzi A, Sandi C, eds. *Combinatorial Optimization* (John Wiley & Sons, New York), 237–279.
* Online reference, fictional example: American Mathematical Institute (2005) Better predictors of geospatial variability. Retrieved June 14, 2005, [www.mathematicsinstitute](http://www.mathematicsinstitute).