Eskisehir Technical University

Department of Computer Engineering and Industrial Engineering

BIM213 & ENM308 Project

SOFTWARE PROJECT ANALYSIS REPORT

MRP PROBLEM

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1. Introduction

At the heart of the production plan are the forecasts of demand for the end items produced over the planning horizon. An end item is the output of the productive system. Components are items in intermediate stages of production, and raw materials are resources that enter the system. It is important to bear in mind that raw materials, components, and end items are defined in a relative and not an absolute sense. Hence, we may wish to isolate a portion of a company's operation as a productive system. End items associated with one portion of the company may be raw materials for another portion. A single productive system may be the entire manufacturing operation of the firm or only a small part of it.

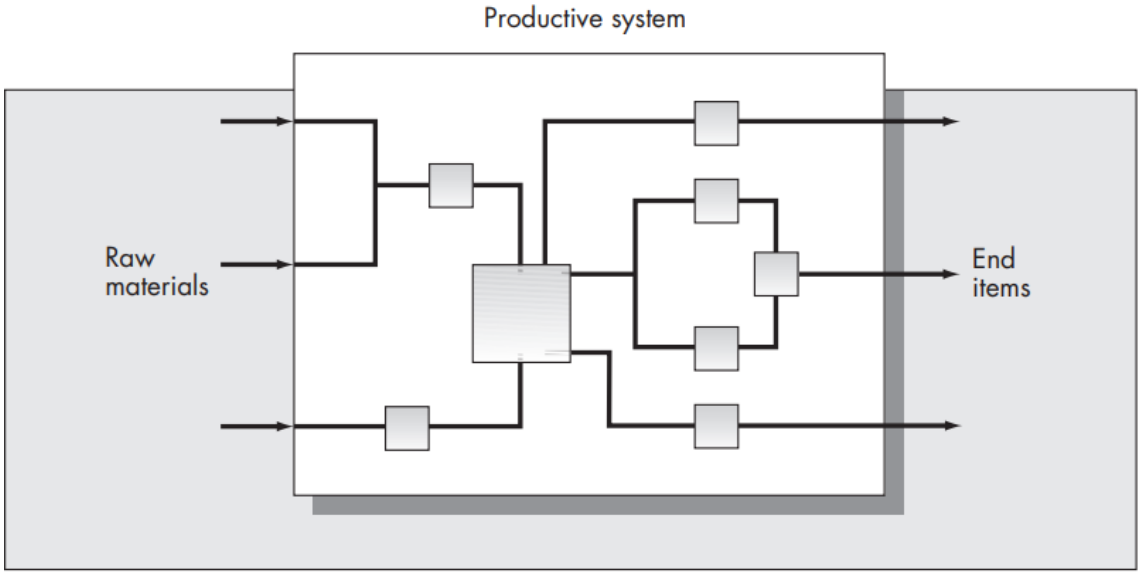

Figure 1 Schematic for MRP

Today, most companies are facing these problems and need software programs to solve these problems. Such software programs solve the problem both quickly and safely. On the other hand, it is more logical to prefer software programs because the manual solution takes a long time and may give erroneous results. In the interface designed in this interdisciplinary project, the user enters the requests according to the weeks they want to receive. By applying the solution algorithm, the desired data is obtained as output. Thus, both fast and accurate results are obtained.

2. Differences Between Planned Program In First Report and Final Report

There were some errors in the solution of the problem given in the first report and the solution of the problem was wrong. The main factor in the wrong solution is the attention deficit caused by people. When the computer solves the problem with a program, these errors are eliminated, and the correct result is reached. Correct results of the problem are given in the section titled "MRP Outputs".

Also, since the solution of the problem is long, errors may occur during manual solution due to many factors. However, when a solution is made in a computer program, these problems are not encountered, and the correct result is achieved.

3. Used Data Structures

Tree data structure is a data structure in which its elements are connected to each other via references, just like in the list data structure. The difference of this data structure from lists is that it is possible for an element to be connected to more than one element, unlike the list data structure. In this way, it is possible to provide a hierarchical sequence between the elements in the tree data structure. In a tree data structure, it indicates the order of that tree data structure, how many elements an element can be linked to at most.

The root is the topmost node in a tree. It is the only node without a parent. The product coded 1605 is the root representing all. Another term is child. It is a node immediately below and directly connected to a given node. A node can have more than one child. As an example, linked products under product code 1605 are its child. The last term is used in the program is parent. The parent is a node immediately above and directly connected to a given node. A node can have only one parent. Product code 13122 is the parent of the product code 457. Since the given problem fits the conditions mentioned above, the tree data structure was used.

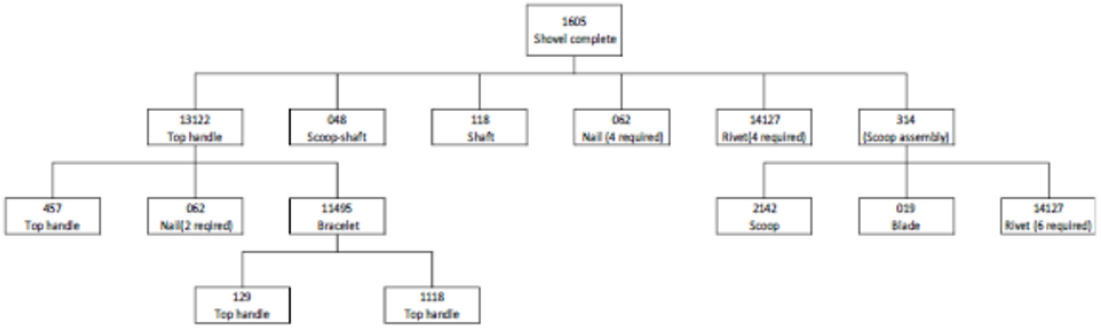

Figure 2 Tree Structure of Project

Another data structure is ArrayList. ArrayList data structure provided us a resizable array. An array could be created to store objects. However, once the array is created, its size is fixed but Java provides the ArrayList class, which can be used to store an unlimited number of objects. ArrayList is part of the Collections Framework. It provides dynamic arrays in Java. Although it can be slower than standard arrays, this structure helps in programs where a lot of manipulations are required on an array.

There are structures that should be dynamic in solving the problem. For example, the number of children of parents differs. For this reason, arrayList structure is also used in the content of the program.

4. MRP OUTPUTS

The outputs of the problem involving the project subject are as follows.

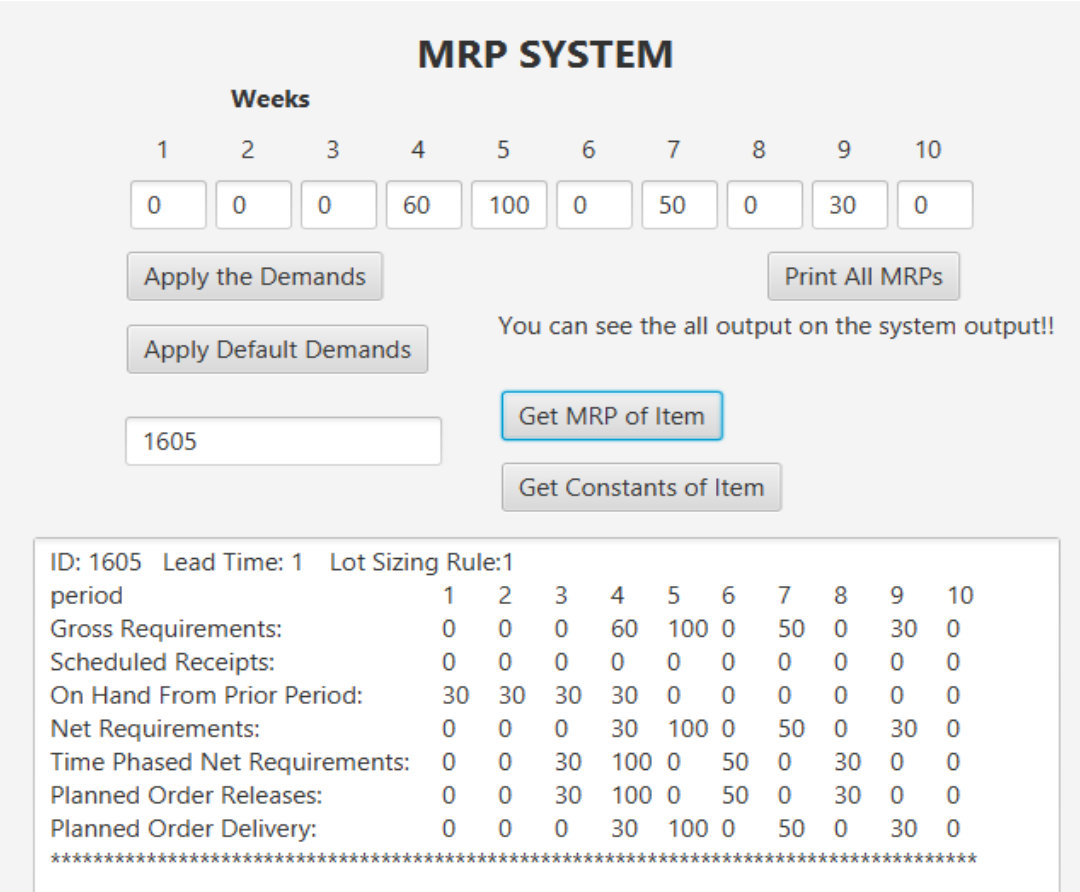

Figure 3 Output of Product Code 1605

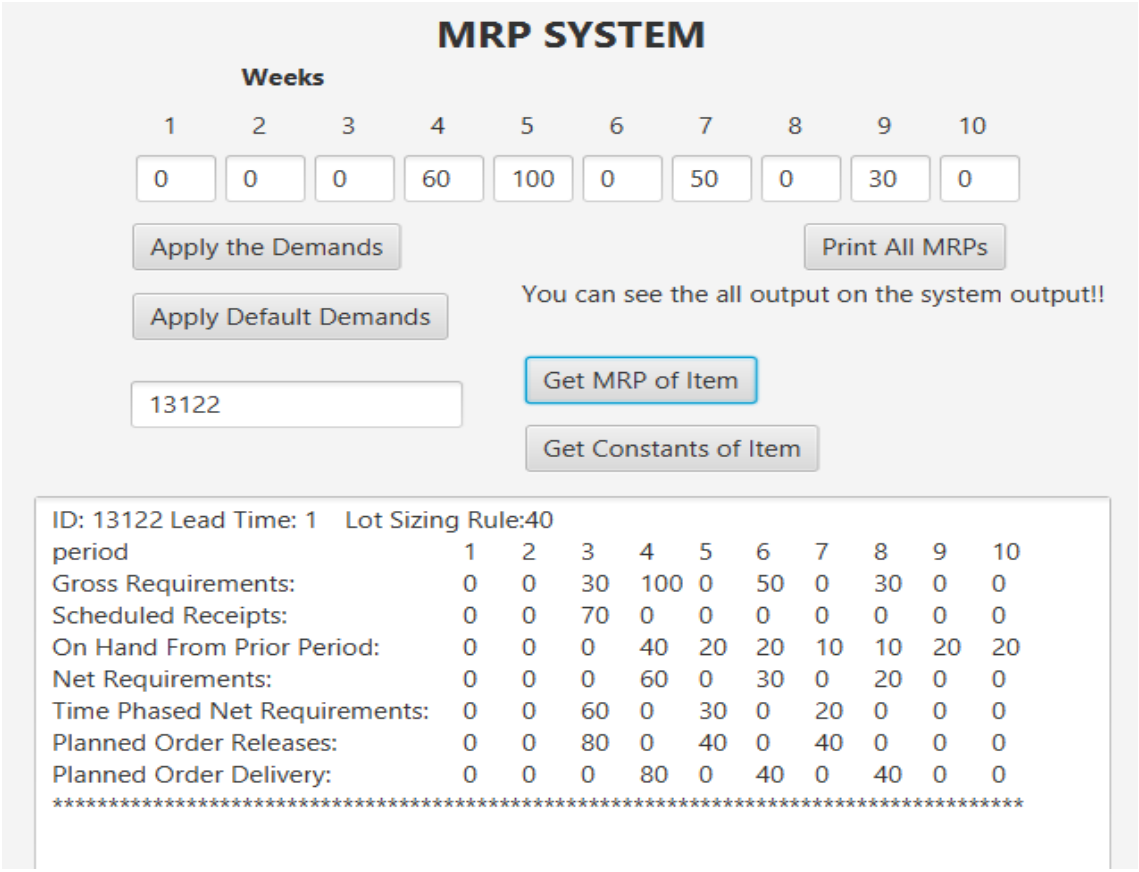

Figure 4 Output of Product Code 13122

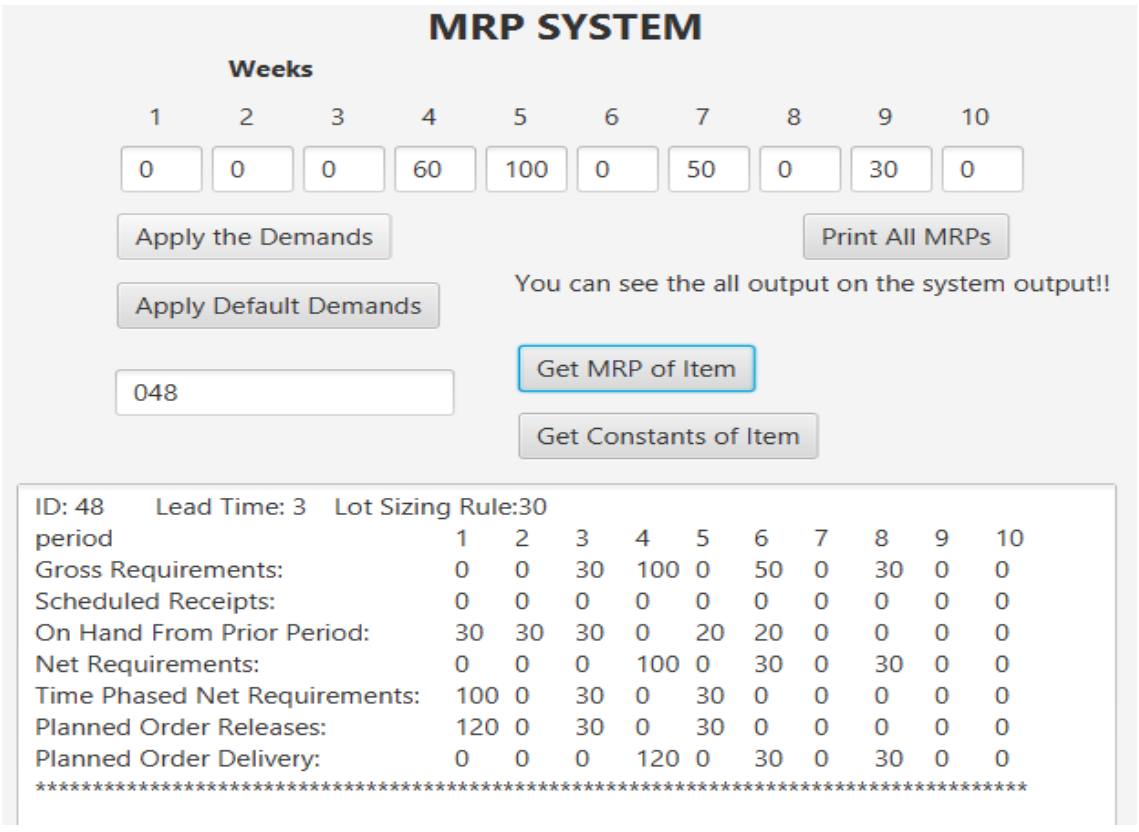

Figure 5 Output of Product Code 048

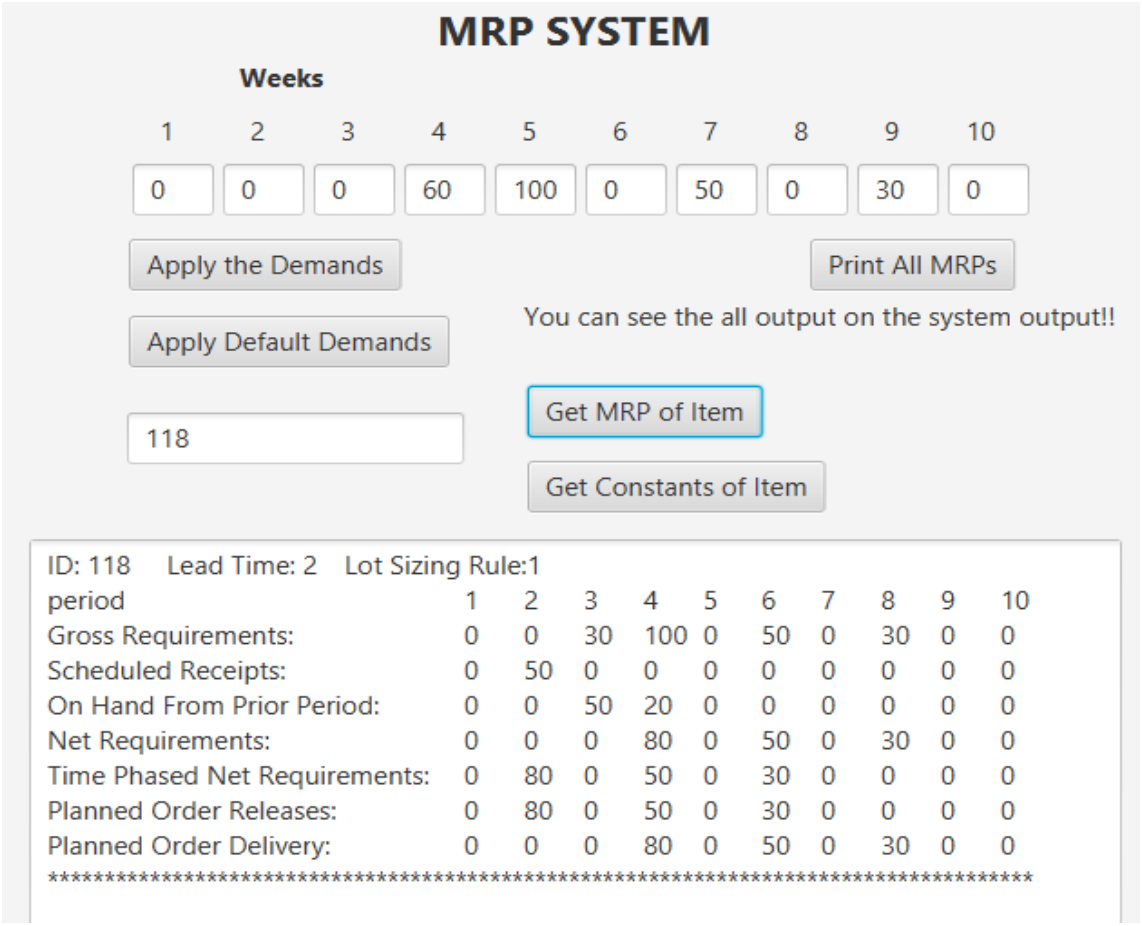

Figure 6 Output of Product Code 118

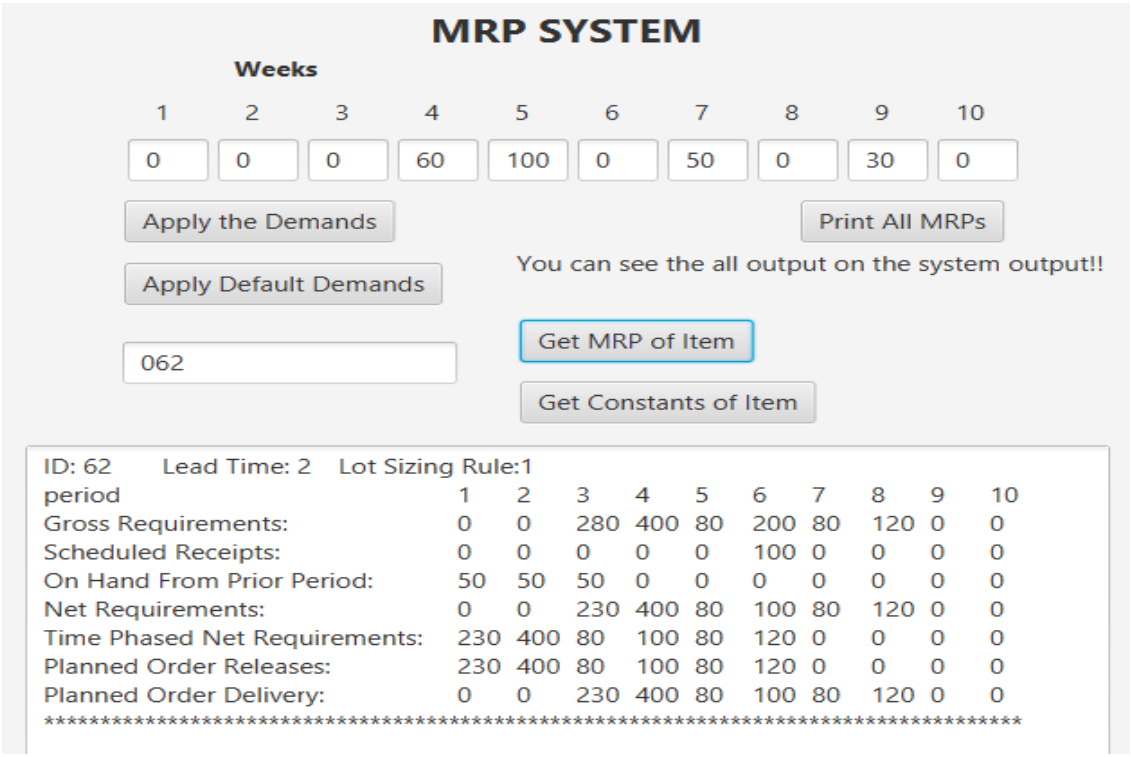

Figure 7 Output of Product Code 062

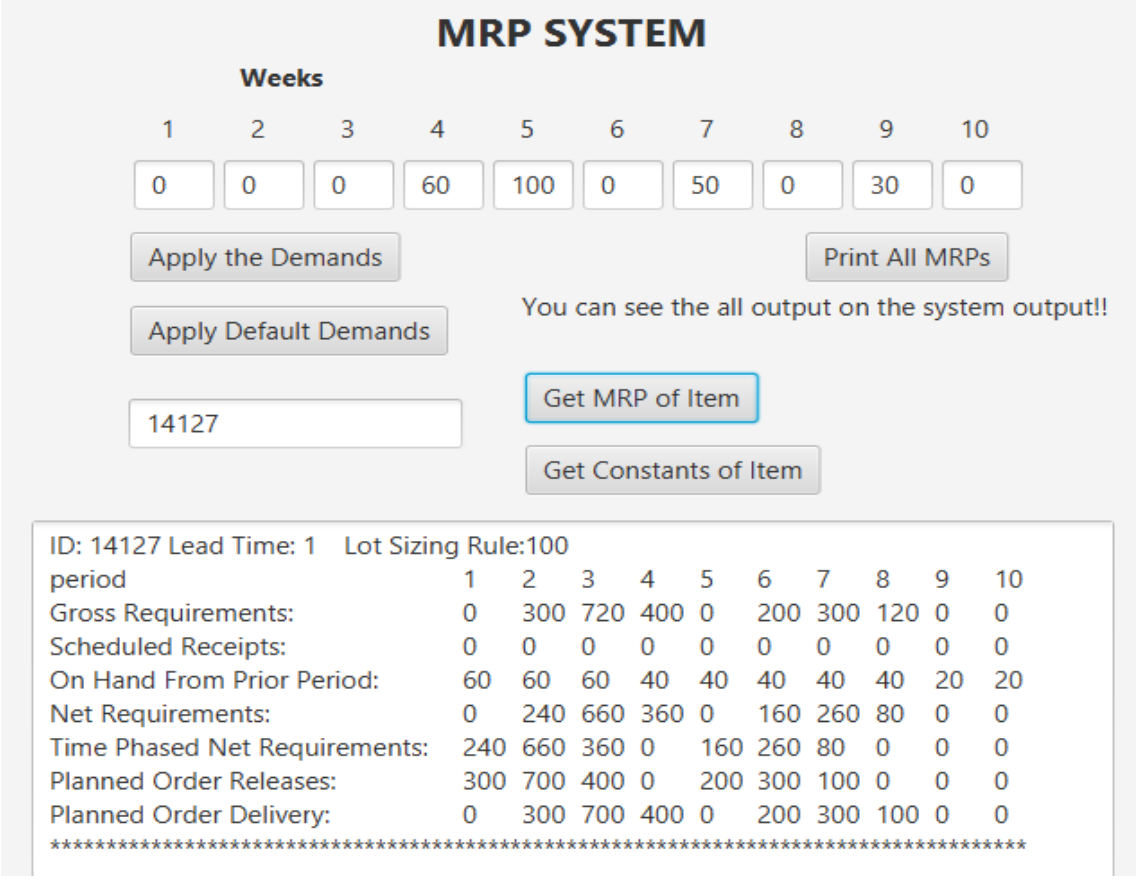

Figure 8 Output of Product Code 14127

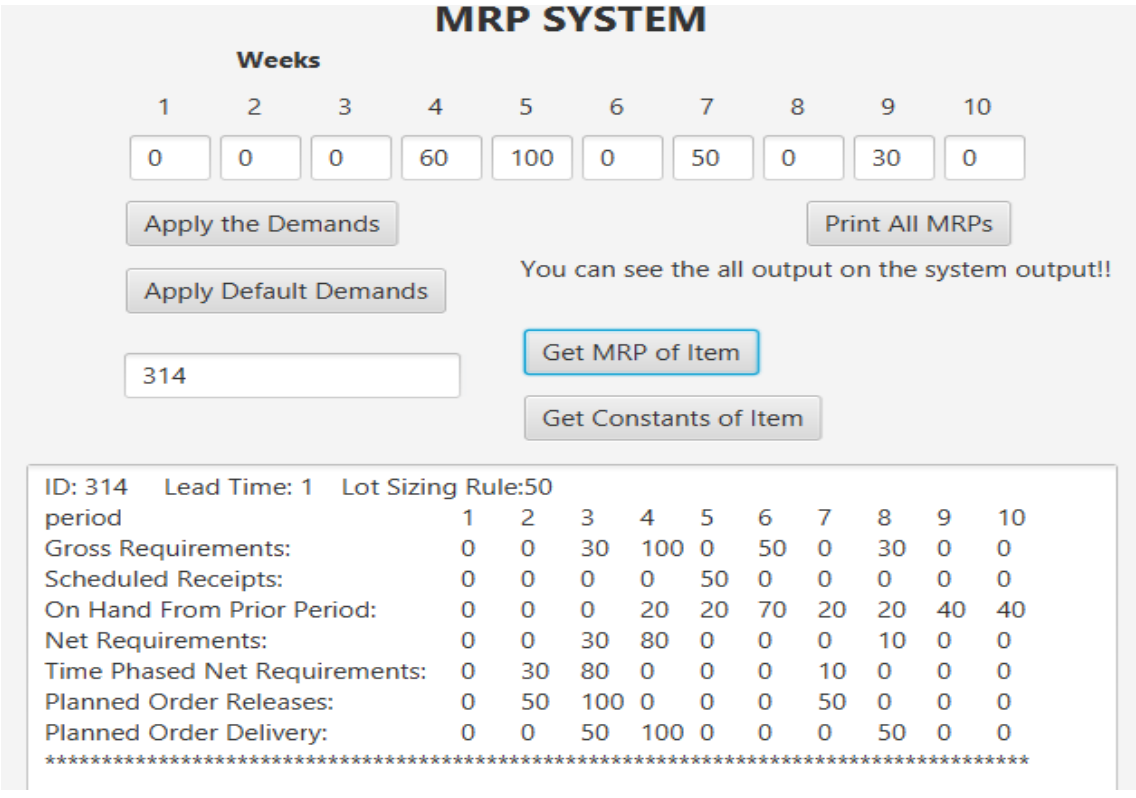

Figure 9 Output of Product Code 314

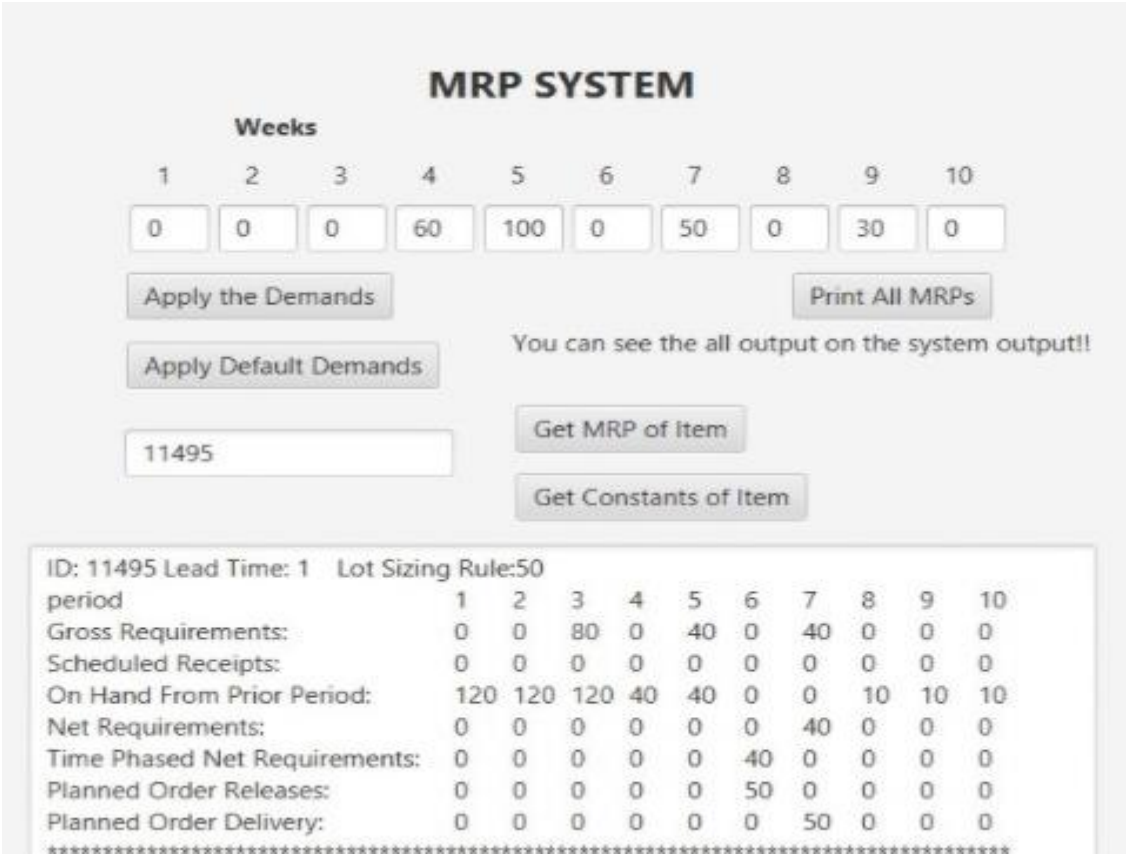

Figure 10 Output of Product Code 11495

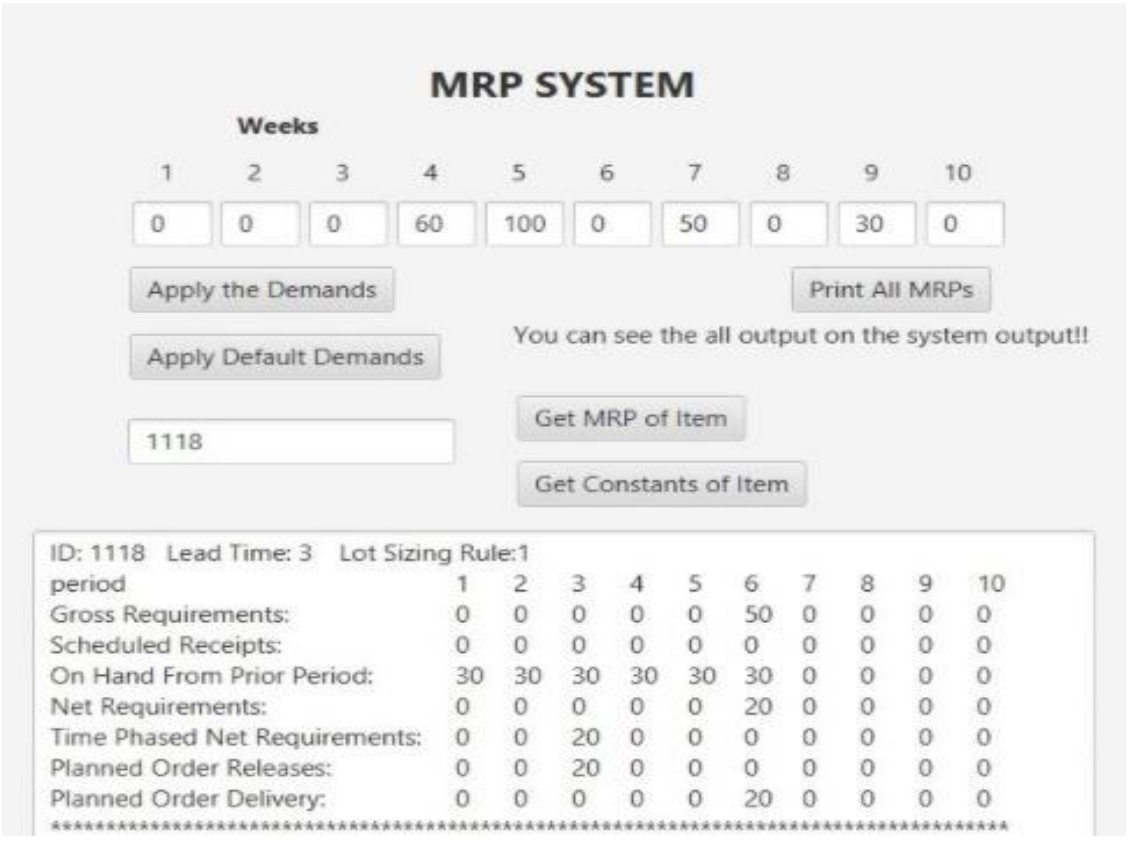

Figure 11 Output of Product Code 1118

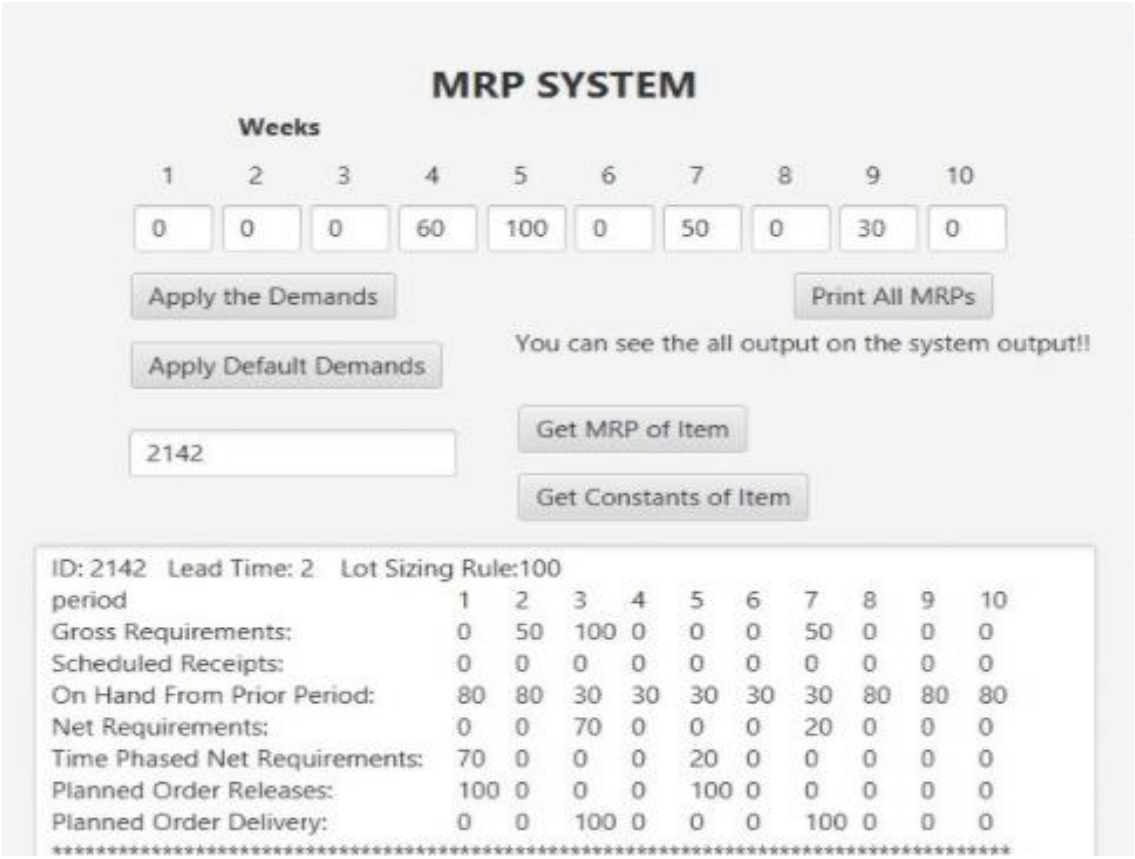

Figure 12 Output of Product Code 2142

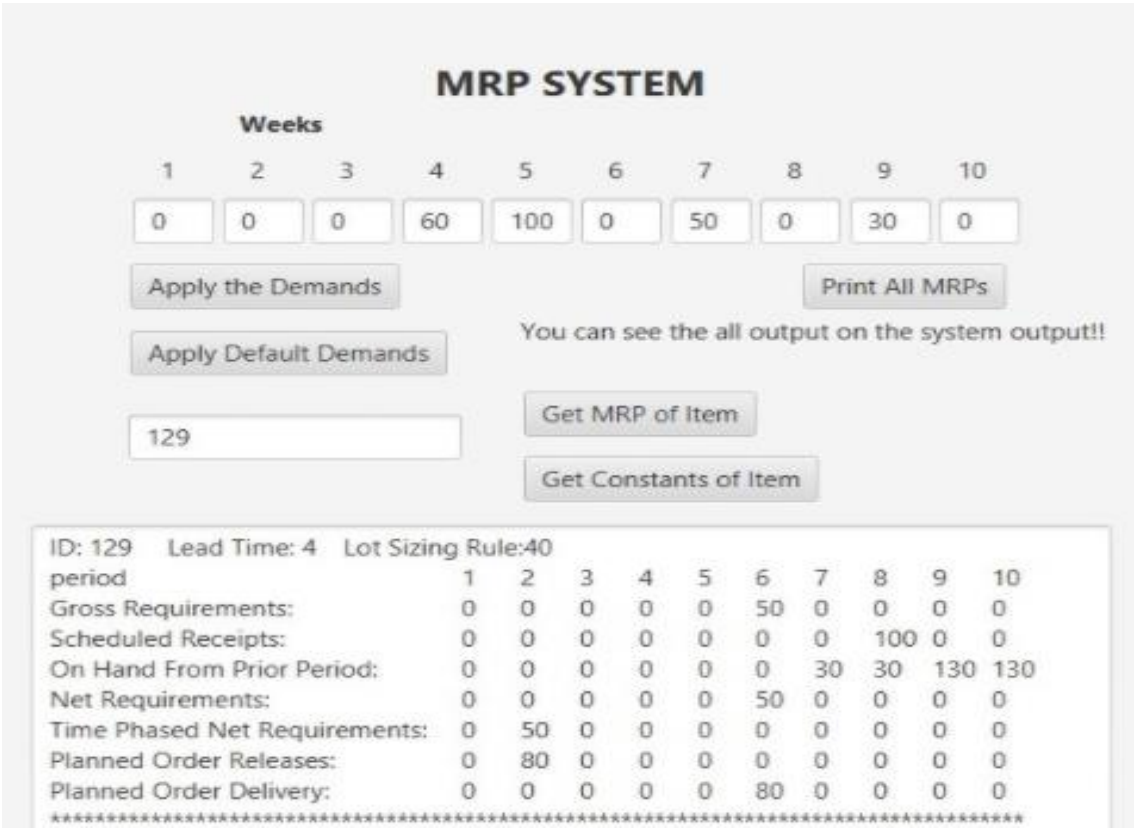

Figure 13 Output of Product Code 129

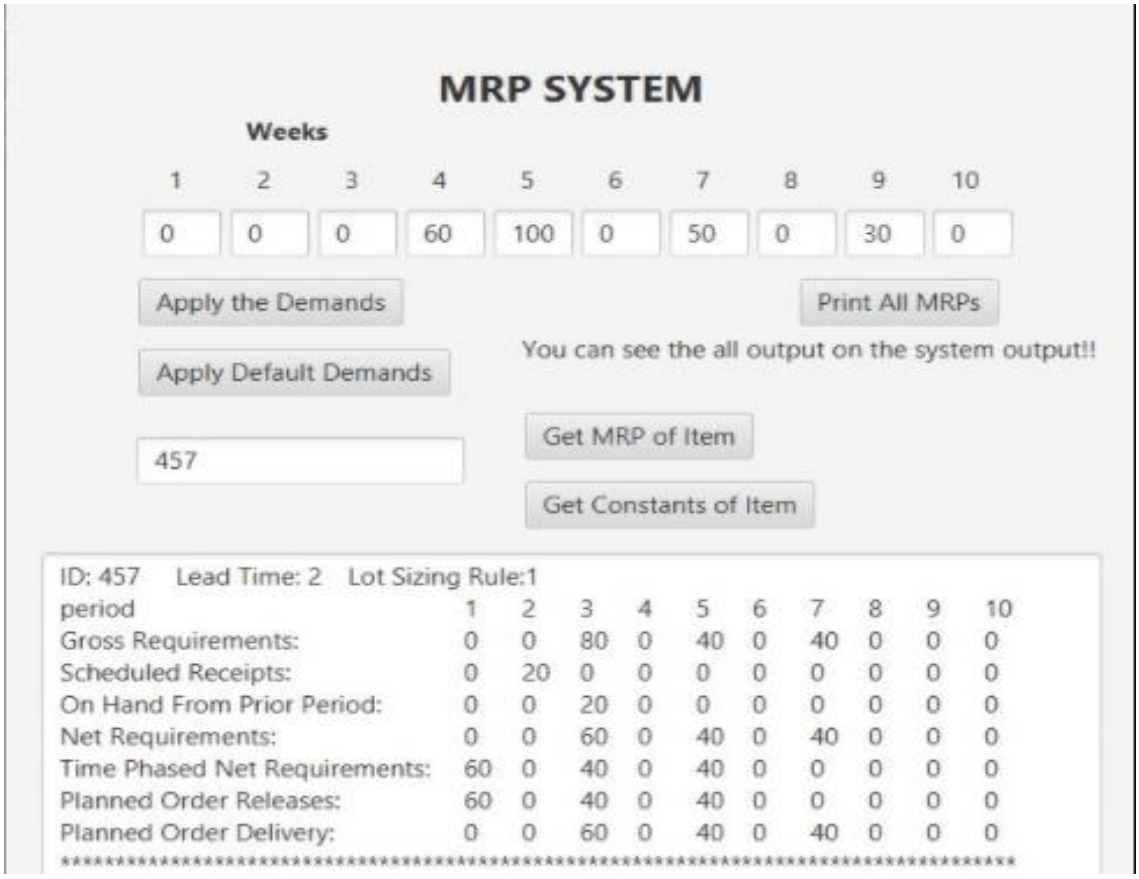

Figure 14 Output of Product Code 457

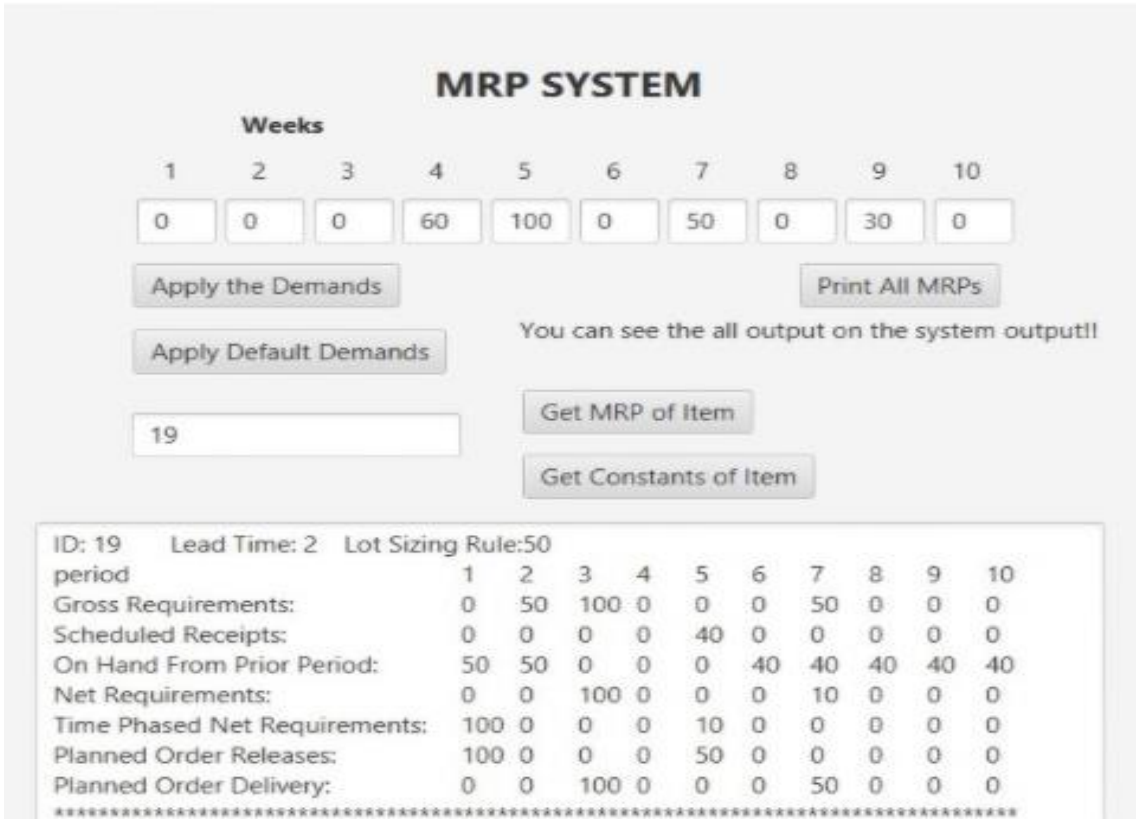

Figure 15 Output of Product Code 19

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Weiss, Mark Allen. *Data Structures & Problem-Solving Using Java*. 4 ed., Florida, Pearson Inc., 2012.