

GYP1 – GYP1 TASK 1: OBJECT-ORIENTED APPLICATION DEVELOPMENT

SOFTWARE I - OBJECT ORIENTED APPLICATION DEVELOPMENT – C482

PRFA – GYP1

COMPETENCIES

430.02.05 : Classes and Interfaces

The graduate designs software solutions with appropriate classes, objects, methods, and interfaces to achieve specific goals.

430.02.06 : Object-Oriented Principles

The graduate implements object-oriented design principles (e.g., inheritance, encapsulation, and abstraction) in developing applications for ensuring the application's scalability.

430.02.07 : Application Development

The graduate produces applications using Java programming language constructs to meet business requirements.

430.02.08 : Exception Handling

The graduate incorporates simple exception handling in application development for improving user experience and application stability.

430.02.09 : User Interface Development

The graduate develops user interfaces to meet project requirements.

INTRODUCTION

Throughout your career in software design and development, you will be asked to create applications with various features and functionality based on business requirements. When a new system is developed, typically the process begins with a business analyst gathering and writing these business requirements, with the assistance of subject matter experts from the business. Then a system analyst works with several application team members and others to formulate a solution based on the requirements. As a developer, you would then create a design document from the solution and finally develop the system based on your design document.

For this assessment, you will create a Java application using the solution statements provided in the requirements section.

Note: The preferred integrated development environment (IDE) for this assignment is NetBeans or IntelliJ (Community Edition). Use the web links below to install one of these IDEs. If you choose to use another IDE, you must export your project into NetBeans or IntelliJ format for submission.

Your submission should include a zip file with all the necessary code files to compile, support, and run your application. The zip file submission must also keep the project file and folder structure intact for the NetBeans IDE.

SCENARIO

You are working for a small manufacturing organization that has outgrown its current inventory system. They have been using a spreadsheet program to manually enter inventory additions, deletions, and other data from a paper-based system but would now like you to develop a more sophisticated inventory program.

They have provided you with a mock-up of the user interface to use in the design and development of the system (see the attached “GUI Mock-Up”) and a class diagram to assist you in your work (see the attached “UML Class Diagram”). The organization also has specific business requirements that must be included as part of the application. A system analyst from your company created the solution statements outlined in the requirements section based on the manufacturing organization’s business requirements. You will use these solution statements to develop your application.

REQUIREMENTS

Your submission must be your original work. No more than a combined total of 30% of the submission and no more than a 10% match to any one individual source can be directly quoted or closely paraphrased from sources, even if cited correctly. An originality report is provided when you submit your task that can be used as a guide.

You must use the rubric to direct the creation of your submission because it provides detailed criteria that will be used to evaluate your work. Each requirement below may be evaluated by more than one rubric aspect. The rubric aspect titles may contain hyperlinks to relevant portions of the course.

I. User Interface

Create a JavaFX application with a graphical user interface (GUI) based on the attached “GUI Mock-Up”. Write code to display *each* of the following screens in the GUI:

A. A main screen, showing the following controls:

- buttons for “Add”, “Modify”, “Delete”, “Search” for parts and products, and “Exit”
- lists for parts and products
- text boxes for searching for parts and products
- title labels for parts, products, and the application title

B. An add part screen, showing the following controls:

- radio buttons for “In-House” and “Outsourced” parts
- buttons for “Save” and “Cancel”
- text fields for ID, name, inventory level, price, max and min values, and company name or machine ID
- labels for ID, name, inventory level, price/cost, max and min values, the application title, and company name or machine ID

C. A modify part screen, with fields that populate with presaved data, showing the following controls:

- radio buttons for “In-House” and “Outsourced” parts
- buttons for “Save” and “Cancel”
- text fields for ID, name, inventory level, price, max and min values, and company name or machine ID
- labels for ID, name, inventory level, price, max and min values, the application title, and company name or machine ID

D. An add product screen, showing the following controls:

- buttons for “Save”, “Cancel”, “Add” part, and “Delete” part
- text fields for ID, name, inventory level, price, and max and min values
- labels for ID, name, inventory level, price, max and min values, and the application
- a list for associated parts for this product
- a “Search” button and a text field with an associated list for displaying the results of the search

E. A modify product screen, with fields that populate with presaved data, showing the following controls:

- buttons for “Save”, “Cancel”, “Add” part, and “Delete” part
- text fields for ID, name, inventory level, price, and max and min values
- labels for ID, name, inventory level, price, max and min values, and the application
- a list for associated parts for this product
- a “Search” button and a text field with associated list for displaying the results of the search

II. Application

Now that you’ve created the GUI, write code to create the class structure provided in the attached “UML (unified modeling language) Class Diagram”. Enable *each* of the following capabilities in the application:

F. Using the attached “UML Class Diagram”, create appropriate classes and instance variables with the following criteria:

- five classes with the 16 associated instance variables
- variables are only accessible through getter methods
- variables are only modifiable through setter methods

G. Add the following functionalities to the main screen, using the methods provided in the attached “UML Class Diagram”:

- redirect the user to the “Add Part”, “Modify Part”, “Add Product”, or “Modify Product” screens
- delete a selected part or product from the list
- search for a part or product and display matching results
- exit the main screen

H. Add the following functionalities to the part screens, using the methods provided in the attached “UML Class Diagram”:

1. “Add Part” screen

- select “In-House” or “Outsourced”
- enter name, inventory level, price, max and min values, and company name or machine ID
- save the data and then redirect to the main screen
- cancel or exit out of this screen and go back to the main screen

2. “Modify Part” screen

- select “In-House” or “Outsourced”
- modify or change data values
- save modifications to the data and then redirect to the main screen
- cancel or exit out of this screen and go back to the main screen

I. Add the following functionalities to the product screens, using the methods provided in the attached “UML Class Diagram”:

1. “Add Product” screen

- enter name, inventory level, price, and max and min values
- save the data and then redirect to the main screen
- associate one or more parts with a product
- remove or disassociate a part from a product

- cancel or exit out of this screen and go back to the main screen
2. “Modify Product” screen
- modify or change data values
 - save modifications to the data and then redirect to the main screen
 - associate one or more parts with a product
 - remove or disassociate a part from a product
 - cancel or exit out of this screen and go back to the main screen

J. Write code to implement exception controls with custom error messages for one requirement out of *each* of the following sets (pick one from each):

1. Set 1

- entering an inventory value that exceeds the minimum or maximum value for that part or product
- preventing the minimum field from having a value above the maximum field
- preventing the maximum field from having a value below the minimum field
- ensuring that a product must always have at least one part

2. Set 2

- including a confirm dialogue for all “Delete” and “Cancel” buttons
- ensuring that the price of a product cannot be less than the cost of the parts
- ensuring that a product must have a name, price, and inventory level (default 0)

K. Demonstrate professional communication in the content and presentation of your submission.

RUBRIC

A:MAIN SCREEN

NOT EVIDENT

No code is provided for a main screen.

APPROACHING COMPETENCE

The main screen does not include all required controls or present a professional appearance. The code contains errors or is incomplete.

COMPETENT

The main screen includes all required controls and presents a professional appearance. The code is complete and functions properly.

B:“ADD PART” SCREEN

NOT EVIDENT

No code is provided.

APPROACHING COMPETENCE

The “Add Part” screen does not include all required controls or present a professional appearance. The code contains errors or is incomplete.

COMPETENT

The “Add Part” screen includes all required controls and presents a professional appearance. The code is complete and functions properly.

C:“MODIFY PART” SCREEN

NOT EVIDENT

COMPETENT

No code is provided.

**APPROACHING
COMPETENCE**

The “Modify Part” screen does not include all required controls or present a professional appearance. The code contains errors or is incomplete.

The “Modify Part” screen includes all required controls, and presents a professional appearance. The code is complete and functions properly.

D:“ADD PRODUCT” SCREEN**NOT EVIDENT**

No code is provided.

**APPROACHING
COMPETENCE**

The “Add Product” screen does not include all required controls or present a professional appearance. The code contains errors or is incomplete.

COMPETENT

The “Add Product” screen includes all required controls and presents a professional appearance. The code is complete and functions properly.

E:“MODIFY PRODUCT” SCREEN**NOT EVIDENT**

No code is provided.

**APPROACHING
COMPETENCE**

The “Modify Product” screen does not include all required controls or present a professional appearance. The code contains errors or is incomplete.

COMPETENT

The “Modify Product” screen includes all required controls and presents a professional appearance. The code is complete and functions properly.

F:CLASS STRUCTURE**NOT EVIDENT**

No code is provided.

**APPROACHING
COMPETENCE**

The application does not include all required classes or includes incorrectly associated instance variables. The variables are accessible and modifiable outside getter and setter methods. The code is incomplete or does not function properly.

COMPETENT

The application includes all required classes and correctly associated instance variables. The variables are only accessible through getter methods and are only modifiable through setter methods. The code is complete and functions properly.

G:MAIN SCREEN FUNCTIONS

NOT EVIDENT

No code is provided.

**APPROACHING
COMPETENCE**

The main screen does not include all required functionalities or does not reflect the methods in the attached class diagram. The code contains errors or is incomplete.

COMPETENT

The main screen includes all required functionalities and reflects the methods in the attached class diagram. The code is complete and functions properly.

H1: "ADD PART" SCREEN FUNCTIONS**NOT EVIDENT**

No code is provided.

**APPROACHING
COMPETENCE**

The "Add Part" screen does not include all required functionalities or does not reflect the methods in the attached class diagram. The code contains errors or is incomplete.

COMPETENT

The "Add Part" screen includes all required functionalities and reflects the methods in the attached class diagram. The code is complete and functions properly.

H2: "MODIFY PART" SCREEN FUNCTIONS**NOT EVIDENT**

No code is provided.

**APPROACHING
COMPETENCE**

The "Modify Part" screen does not include all required functionalities or does not reflect the methods in the attached class diagram. The code contains errors or is incomplete.

COMPETENT

The "Modify Part" screen includes all required functionalities and reflects the methods in the attached class diagram. The code is complete and functions properly.

I1: "ADD PRODUCT" SCREEN FUNCTIONS**NOT EVIDENT**

No code is provided.

**APPROACHING
COMPETENCE**

The "Add Product" screen does not include all required functionalities or does not reflect the methods in the attached class diagram. The code contains errors or is incomplete.

COMPETENT

The "Add Product" screen includes all required functionalities and reflects the methods in the attached class diagram. The code is complete and functions properly.

J2:"MODIFY PRODUCT" SCREEN FUNCTIONS

NOT EVIDENT

No code is provided.

APPROACHING COMPETENCE

The "Modify Product" screen does not include all required functionalities or does not reflect the methods in the attached class diagram. The code contains errors or is incomplete.

COMPETENT

The "Modify Product" screen includes all required functionalities and reflects the methods in the attached class diagram. The code is complete and functions properly.

J1:EXCEPTION CONTROLS: SET 1

NOT EVIDENT

No code is provided.

APPROACHING COMPETENCE

The application does not include *one* required exception control from set 1, or the language used in the custom error messages is not appropriate or distracts from the application. The code contains errors or is incomplete.

COMPETENT

The application includes *one* required exception control from set 1, and uses appropriate language in the custom error messages. The code is complete and functions properly.

J2:EXCEPTION CONTROLS: SET 2

NOT EVIDENT

No code is provided.

APPROACHING COMPETENCE

The application does not include *one* required exception control from set 2, or the language used in the custom error messages is not appropriate or distracts from the application. The code contains errors or is incomplete.

COMPETENT

The application includes

K. PROFESSIONAL COMMUNICATION:

NOT EVIDENT

Content is unstructured, is disjointed, or contains pervasive errors in mechanics, usage, or grammar. Vocabulary or tone is

APPROACHING COMPETENCE

Content is poorly organized, is difficult to follow, or contains errors in mechanics, usage, or

COMPETENT

Content reflects attention to detail, is organized, and focuses on the main ideas as prescribed in the task or chosen by the

unprofessional or distracts from the topic.

grammar that cause confusion. Terminology is misused or ineffective.

candidate. Terminology is pertinent, is used correctly, and effectively conveys the intended meaning. Mechanics, usage, and grammar promote accurate interpretation and understanding.

WEB LINKS

[NetBeans Installation Instructions](#)

[IntelliJ \(Community Edition\)](#)

SUPPORTING DOCUMENTS

[GUI Mock Up.docx](#)

[UML Class Diagram.pdf](#)