Advanced Programming

**Research Project Report**

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Project Summary

The Advanced Programming project utilized Java Programming Language to successfully create a desktop application which utilizes the Swing based graphical user interface, The application named “John Snack Shop “ is used as a medium in which students on campus can select and order snacks and John can login and see the snacks ordered, thus allowing his rider to make deliveries. In order to implement the project certain software principles and tools where utilized, these include but not limited to

-SOLID principles

- Repository Pattern

- Model-View-Controller Pattern

- Singleton Pattern

- Factory Pattern

- Code Generation Tool

- Source Control Management Tool

- Package Management Tool

- Unit Testing and Test Automation

- Continuous Integration using a Continuous Integration Server

Principles Implemented

**S- Singular Responsibility** Numerous functions and methods with the function has a single role to complete, thus allowing error detection to be seamless.

E.g. **public** **void** selectLogin() {

VerifyLogin();

}

Satalkar, B. ( 2010, July 15). Learn Java.

**O-Open/Closed** . This principle was utilized mainly in building the User Interface, Model classes were created and closed and other classes where created to allow more options and then and inheritance relationship was used to allow Open/Closed usage

Eg : **class** Image Panel **extends** JPanel{////Method Placed Here }

Satalkar, B. ( 2010, July 15). Learn Java.

**L**- Liskov Substitution. This principle was used in the Order Request. Snack and Students Inherited from the class Order Request . So objects of Order requests were passed to functions so therefore the Snacks and Student classes could be accessed first.

**Interfaces No interfaces were implemented;**

**D- Dependency Inversion** , In the project we depended on abstract types that could be substituted for another for another object .

The Model-View-Controller Pattern was used in the implementation, So they user had a view which interacted with the models through the controller

**The Factory Pattern And Singleton** was implemented with the file class “ALLOrders” where the all orders class inherited from a class file data, Other file classes inherits from the “FILE DATA”class. The then a class would accept a string and if the string matches the requirement it would call the Singleton Pattern of the “ALLOrders” to check if the instance of the file has been created. The following is an extract of the code used in the project

**public** **class** FileFactory {

**public** FileData getFILE(String Type) {

childFile x = **new** childFile();

**if** (Type.equals("write") ) {

ALLOrders win = ALLOrders.*getInstance*();

**return** win;

}**else** {

**return** **new** childFile();

}

}

}

**class** Fileopen {

**The Code Generation Tool** that was used was teleoys which was used to develop ERDs and other code documentation.

The Unit Test tool that was used is an online platform called Parasoft Unit Testing and it highlighted numerous inefficiencies in the code. Some of which were resolved.

**The Package Management Tool** that was used is Nuget Package Manager. It is a widely used package tool and to create, update and remove packages.

Below is a snipped of the code used to run the Package Management Tool in Command Line

*# Add the Elmah package to the default project as specified in the console's project selector*

*Install-Package Elmah*

*# Add the Elmah package to a project named UtilitiesLib that is not the default*

*Install-Package Elmah -ProjectName UtilitiesLib*

**The integration server** used was GITHUB, thus allowed for a repository which online edits could be made. The repository for the research project can be found <https://github.com/bergen876/AP-Research-Project/blob/master/Advanced%20Programming.docx>

Youtube Video Link : https://youtu.be/fmIbSo3aT3k

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