

V) C++ Code Implementation

This document attempts to justify and show how the C++ code was implemented to fit the design pattern that was described in section IV).

The Director calls a Row Builder class in order to build a particular row object (In this case, Grants and Clinical Funding.) A multimap is also created in order to store Grant_rowObjects.

```
163 | //Builder object
164 | GrantRowBuilder Builder;
165 | multimap<string, Grant_rowObject>* grantsDictionary = new multimap<string, Grant_rowObject>();
```

Figure 5-1: Lines 163-165 of Director.cpp

The Builder then uses buildRow function which then calls a series of getAttribute functions of Attribute Retriever class that returns every attribute from the Grants row.

```
18 | string name = fetch.getAttribute(index.name_loc);
19 | string domain = fetch.getAttribute(index.domain_loc);
20 | string fundType = fetch.getAttribute(index.fundType_loc);
21 | string stat = fetch.getAttribute(index.stat_loc);
22 | string role = fetch.getAttribute(index.role_loc);
23 | string title = fetch.getAttribute(index.title_loc);
24 | string pInvestigator = fetch.getAttribute(index.pInvestigator_loc);
25 |
26 | // Deal with multiple co-investigators in a cell
27 | string cpInvestigator = fetch.getAttribute(index.cpInvestigator_loc);
28 | fetch.grabFirstString(cpInvestigator); //TEMPORARY -returns first co-investigator
29 |
30 | bool peerReviewed = fetch.getBoolAttribute(index.peerReviewed_loc);
31 | bool indGrant = fetch.getBoolAttribute(index.indGrant_loc);
32 |
33 | int sDate = fetch.getIntAttribute(index.sDate_loc);
34 | int eDate = fetch.getIntAttribute(index.eDate_loc);
35 | int totalAmount = fetch.getIntAttribute(index.totalAmount_loc);
```

Figure 5-2: buildRow function: Lines 18-35 of GrantRowBuilder.cpp

Once a row is built, it is then inserted into the multimap.

```
172 | //make new object and insert into map
173 | Grant_rowObject holder = Builder.buildRow(temp, colIndex);
174 | grantsDictionary->insert(pair<string, Grant_rowObject>(holder.name, holder));
175 | count++;
```

Figure 5-3: Lines 172 – 175 of Director.cpp