Pattern 1:

Code Snippet:

```
(…)
boolean contains(Task var1);

    public interface Factory {
        TaskContainmentHierarchyFacade createFacade();
    }
}
```

Location on the code base: ganttproject/bin/main/net/sourceforge/ganttproject/task/TaskContainmentHierarchyFacade.class

Pattern identification: Factory method - This interface hides the creation of the instance TaskContainmentHierarchyFacade. This interface is useful in the class FacadeFactoryImpl nested in the class TaskManagerImpl

Pattern 2:

Code Snippet:

Fig1

```
public class CommandLineExportApplication {
    private LoggerApi logger;

    public CommandLineExportApplication() {
        throw new Error("Unresolved compilation problems: \n\tThe import 
biz.ganttproject.LoggerApi cannot be resolved\n\tThe import 
net.sourceforge.ganttproject.IGanttProject cannot be resolved\n\tLoggerApi 
cannot be resolved to a type\n\tThe method create(String) from the type 
GPLogger refers to the missing type LoggerApi\n\tIGanttProject cannot be 
resolved to a type\n\tIGanttProject cannot be resolved to a 
type\n\tLoggerApi cannot be resolved to a type\n\tConsoleProgressProvider 
cannot be resolved to a type\n");
    }

    public boolean export(Args var1, IGanttProject var2, UIFacade var3) {
        throw new Error("Unresolved compilation problem: \n\tIGanttProject 
cannot be resolved to a type\n");
    }

    boolean export(Exporter var1, Args var2, IGanttProject var3, UIFacade 
var4) {
        throw new Error("Unresolved compilation problems: \n\tIGanttProject 
cannot be resolved to a type\n\tLoggerApi cannot be resolved to a 
type\n\tConsoleProgressProvider cannot be resolved to a type\n");
    }

    public static class Args {
        @Parameter(
            names = {"-export"},
            description = "Export format"
        )
        public String exporter;
        @Parameter(
            names = {"-stylesheet"},
            description = "Stylesheet used for export"
        )
        public String stylesheet;
        @Parameter(
            names = {"-chart"},
            description = "Chart to export (resource or gantt)"
        )
        public String chart;
        @Parameter(
            names = {"-zoom"},
            description = "Zoom scale to use in the exported charts"
        )
        public Integer zooming;
        @Parameter(
            names = {"-o", "-out"},
            description = "Output file name",
            converter = FileConverter.class
        )
        public File outputFile;
        @Parameter(
            names = {"-expand-resources"},
            description = "Expand resource nodes on the resource load
chart"
        )
        public boolean expandResources;
        @Parameter(
            names = {"-expand-tasks"},
            description = "Expand all tasks nodes on the Gantt chart",
            arity = 1
        )
        public boolean expandTasks;

        public Args() {
            throw new Error("Unresolved compilation problems: \n\tThe
import biz.ganttproject.LoggerApi cannot be resolved\n\tThe import
net.sourceforge.ganttproject.IGanttProject cannot be resolved\n\tLoggerApi
cannot be resolved to a type\n\tThe method create(String) from the type
GPLogger refers to the missing type LoggerApi\n\tIGanttProject cannot be
resolved to a type\n\tIGanttProject cannot be resolved to a
type\n\tLoggerApi cannot be resolved to a type\n\tConsoleProgressProvider
cannot be resolved to a type\n");
        }
    }
}
```

Fig2

```
} else {
  appBuilder.whenDocumentReady(project -> {
    var executor = Executors.newSingleThreadExecutor();
    executor.submit(() -> {
      var cliApp = new CommandLineExportApplication();
      cliApp.export(appBuilder.getCliArgs(), project, ((GanttProject)
project).getUIFacade());
      GanttProject.doQuitApplication(true);
    });
    return Unit.INSTANCE;
  });
}
```

Location on the code base:

Fig1 - code/ganttproject/src/main/java/net/sourceforge/ganttproject/application/MainApplication.java

Fig2 - ganttproject/bin/main/net/sourceforge/ganttproject/export/CommandLineExportApplication.class

Pattern identification: Command Pattern – the class MainApplication – the invoker – invokes an object from CommandLineExportApplication to complete a task. This class CommandLineExportApplication can be considered as a command manager because manipulates and invokes the commands needed to finish this method.

Pattern 3:

Code Snippet:

Fig1

```java
package net.sourceforge.ganttproject.gui;

import biz.ganttproject.core.table.ColumnList;
import com.google.common.base.Predicate;
import java.awt.Component;
import javax.swing.AbstractAction;
import net.sourceforge.ganttproject.action.GPAction;

public interface TreeUiFacade<T> {
    Component getTreeComponent();

    ColumnList getVisibleFields();

    boolean isVisible(T var1);

    boolean isExpanded(T var1);

    void setExpanded(T var1, boolean var2);

    void applyPreservingExpansionState(T var1, Predicate<T> var2);

    void setSelected(T var1, boolean var2);

    void clearSelection();

    void makeVisible(T var1);

    GPAction getNewAction();

    GPAction getPropertiesAction();

    GPAction getDeleteAction();

    void startDefaultEditing(T var1);

    void stopEditing();

    AbstractAction[] getTreeActions();
}
```

Fig2

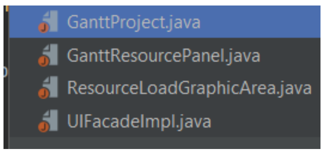
```java
public interface ResourceTreeUIFacade extends TreeUiFacade<HumanResource> {
    AbstractAction getMoveUpAction();

    AbstractAction getMoveDownAction();

    TimelineChart.VScrollController getVScrollController();
}
```

Location on the code base:

Fig1 - ganttproject/bin/main/net/sourceforge/ganttproject/gui/TreeUiFacade.class

Fi2 - ganttproject/bin/main/net/sourceforge/ganttproject/gui/ResourceTreeUIFacade.class

Pattern identification:



Facade – The interface ResourceTreeUIFacade, an extension of the interface TreeUiFacade, in an encapsulation of a subsystem with four classes. This interface acts as a point of entry into this subsystem.