

Java Problem Creator, Solver and Teacher (Educational Tools).

A Software Project Presented
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Content

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Motivation

- Computer aided learning improves the understanding of students.
 - Availability.
 - Cost.
- Distant learning for:
 - Employees in different plants.
 - Disabled persons.
- Help businessmen make decisions while dealing with an economical problem.

Requirements (1)

- Electronic teacher.
- Allow teachers to add new case studies.
- Help businessmen make decisions.
- Dynamically builds the interfaces.
- Dynamically stores the needed data for a case study and allow several operations on it.
- Dynamic help.
- Class reuse.
- Object oriented programming.
- ✎ Easily extendible.

Requirements (2)

- A large set of question types.
- 2D graphs (only drawn area is shown, moving referential).
- Mail application.
- Two session modes for the students.
- Secure.
- Network usage.
- Implementation of four problems belonging to different fields of science & prove that the ideas behind are working.

Requirements (3)

■ Needed Software and Support

- Java Programming Language.
- Microsoft Access Database.
- Java DataBase Connectivity (JDBC).

■ Components of a case study

- Case description.
- A set of questions.
- Web links.
- Values of variables.
- Graph.

Chosen approach (1)

- **Solver Interface** (general interface) is where the user identifies himself (instructor, student or businessman).
- **Instructor Interface:**
 - Description Panel.
 - Question Panel.
 - Web Link Panel.
 - Graph Panel.
 - Variables Panel.

The necessary inputs for building the Variables Panel as well as the database tables and help for each problem are read from values filled in the database tables.

Approach (2)

- Those inputs are:
 - Variable name.
 - Variable panel type.
 - If the type is choice: provide the choices.
 - Variable row.
 - Variable column.
 - Variable series.
 - Is the variable value stored in the database.
 - Variable description.

Approach (3)

■ Student Interface

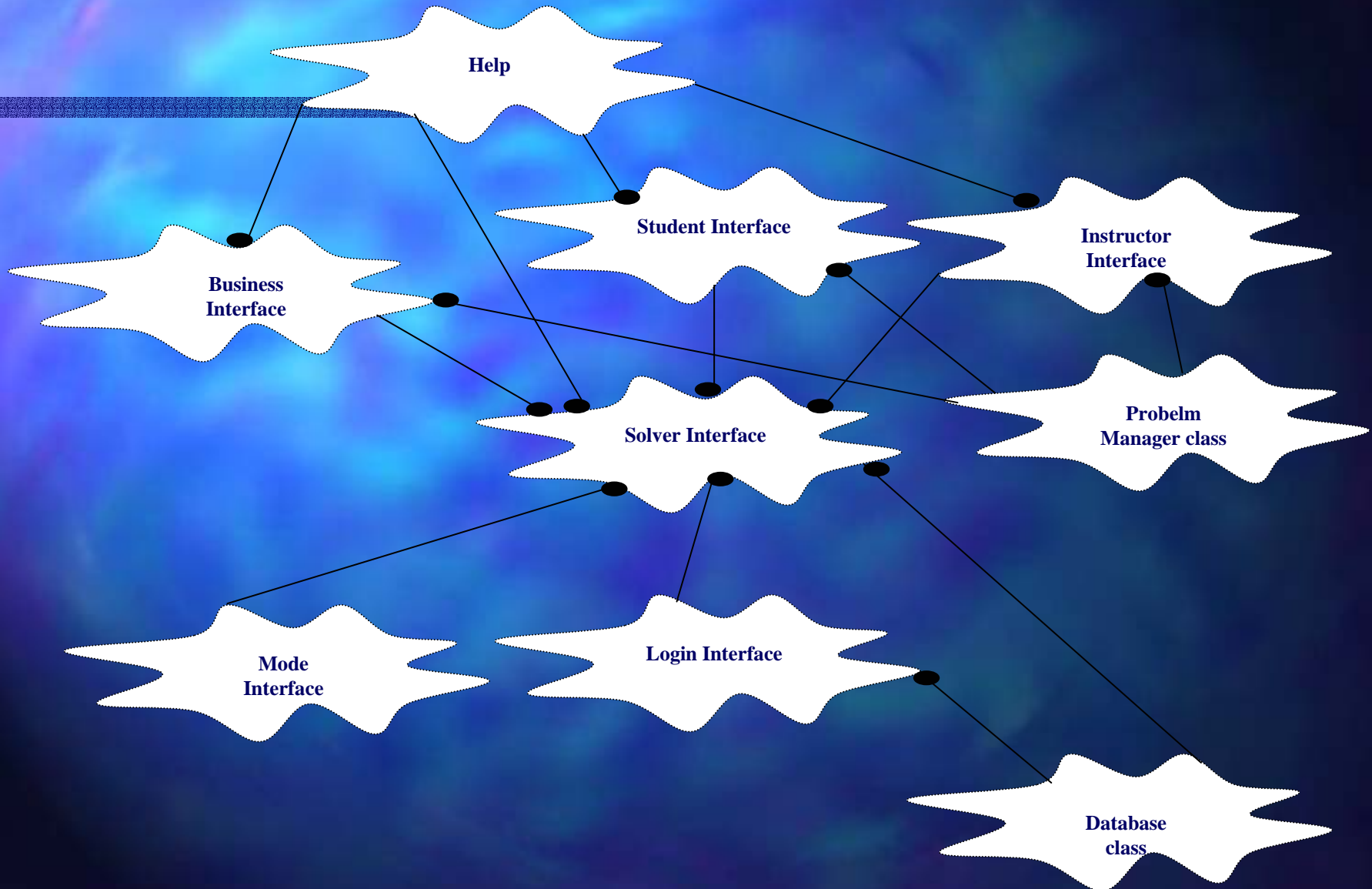
- Student description panel.
- Student questions and answers panel.
- Student Web links panel.
- Variables panel.
- Graph Panel.

Approach (4)

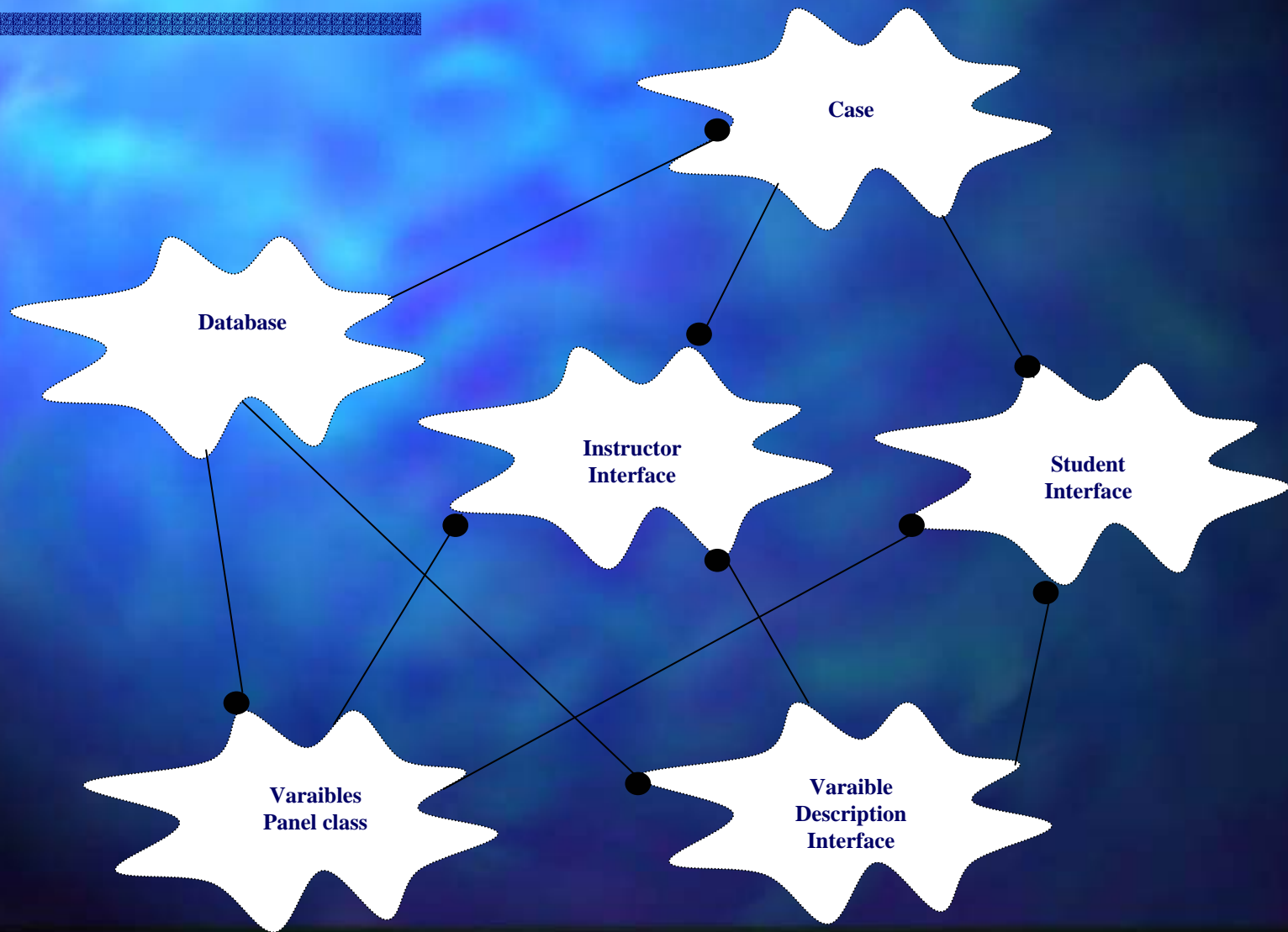
- Business Interface

- Question panel.
- Answer panel.
- Answer list panel.
- Graph panel.

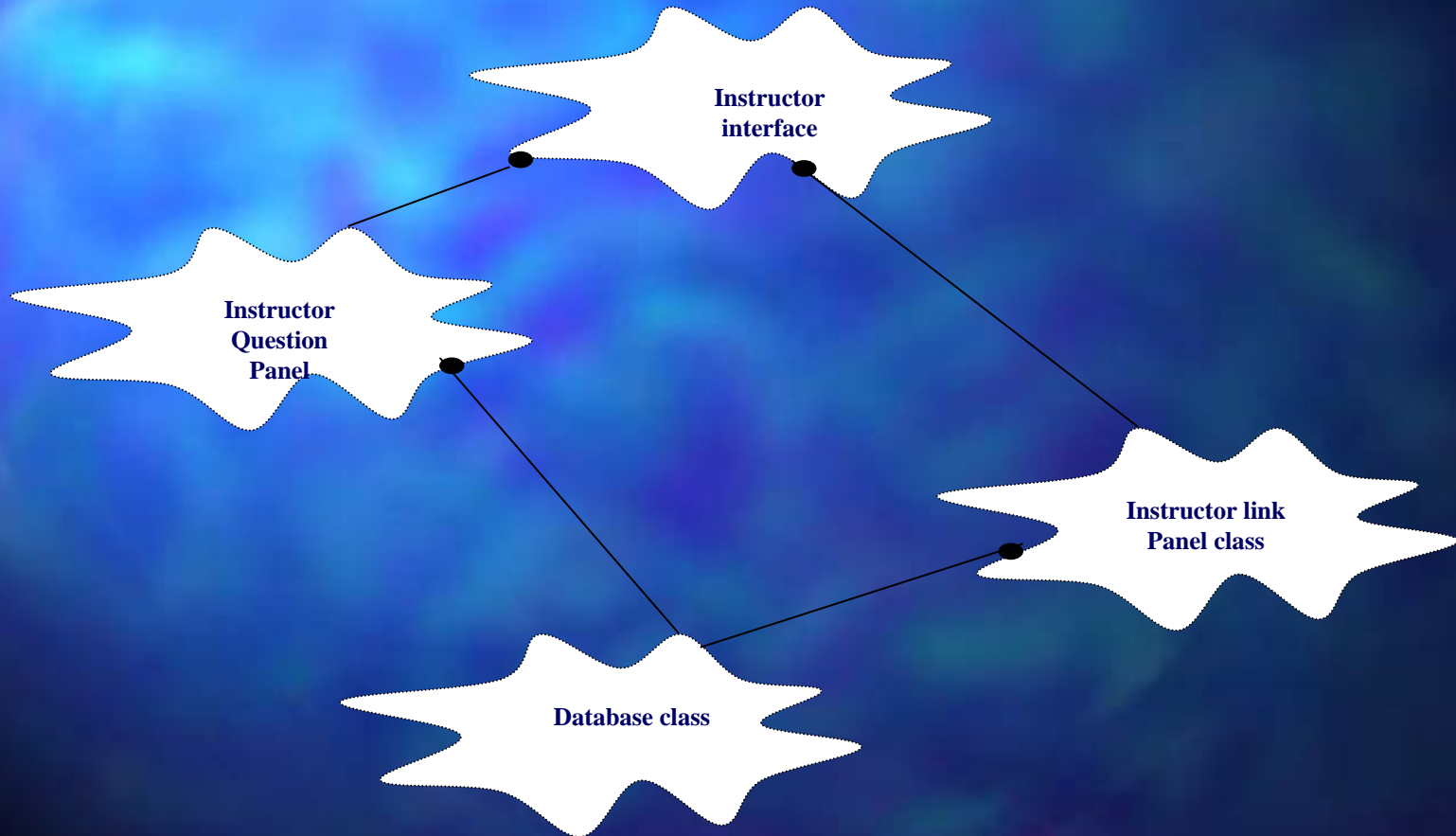
Design Diagrams (1)



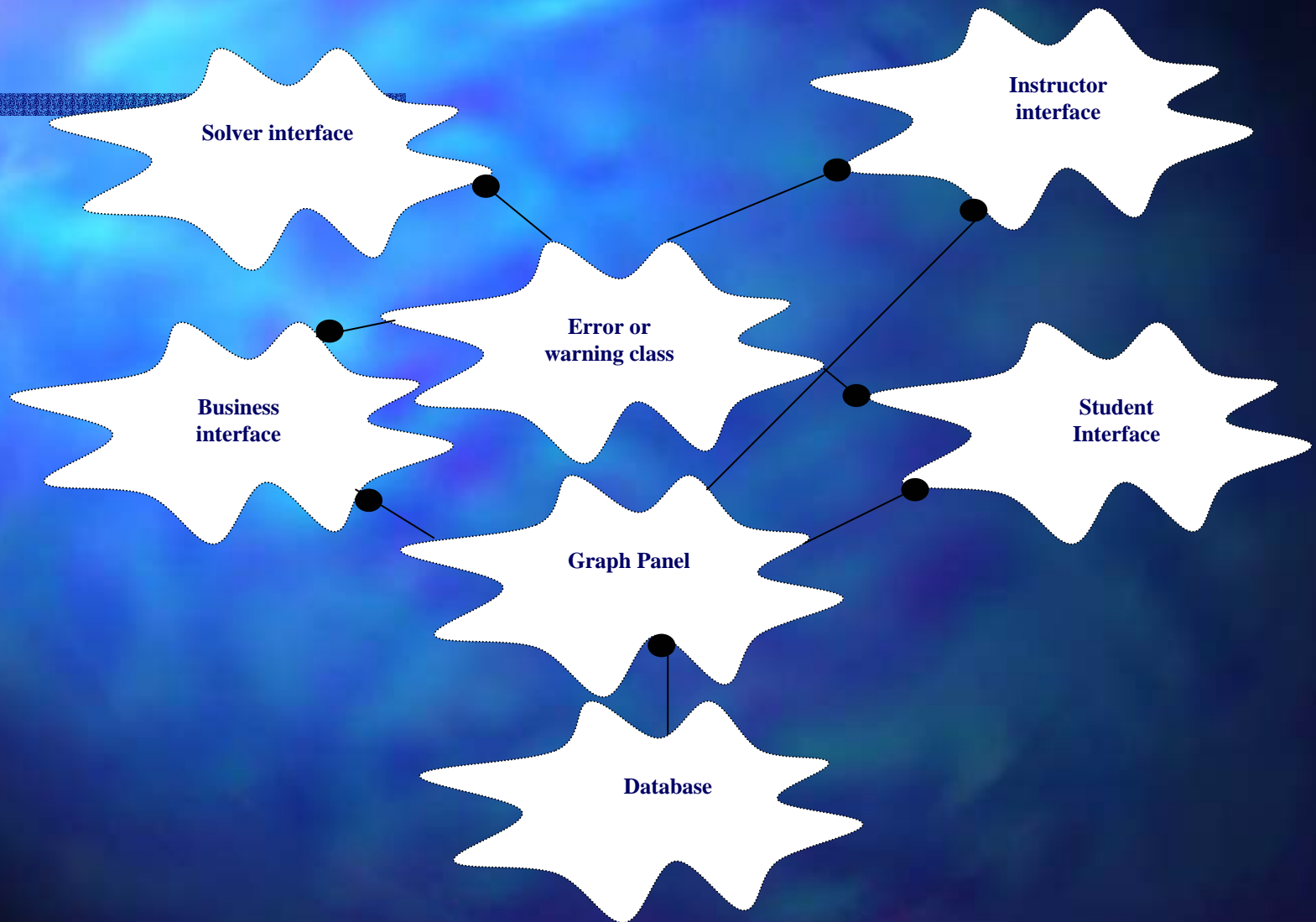
Design Diagrams (2)



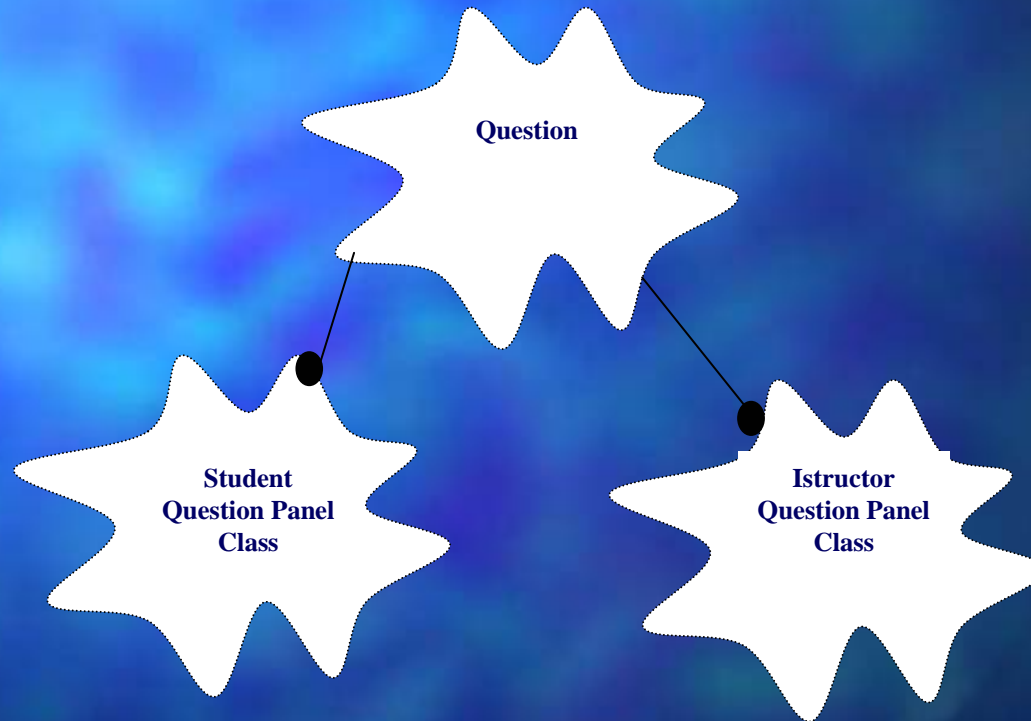
Design Diagrams (3)



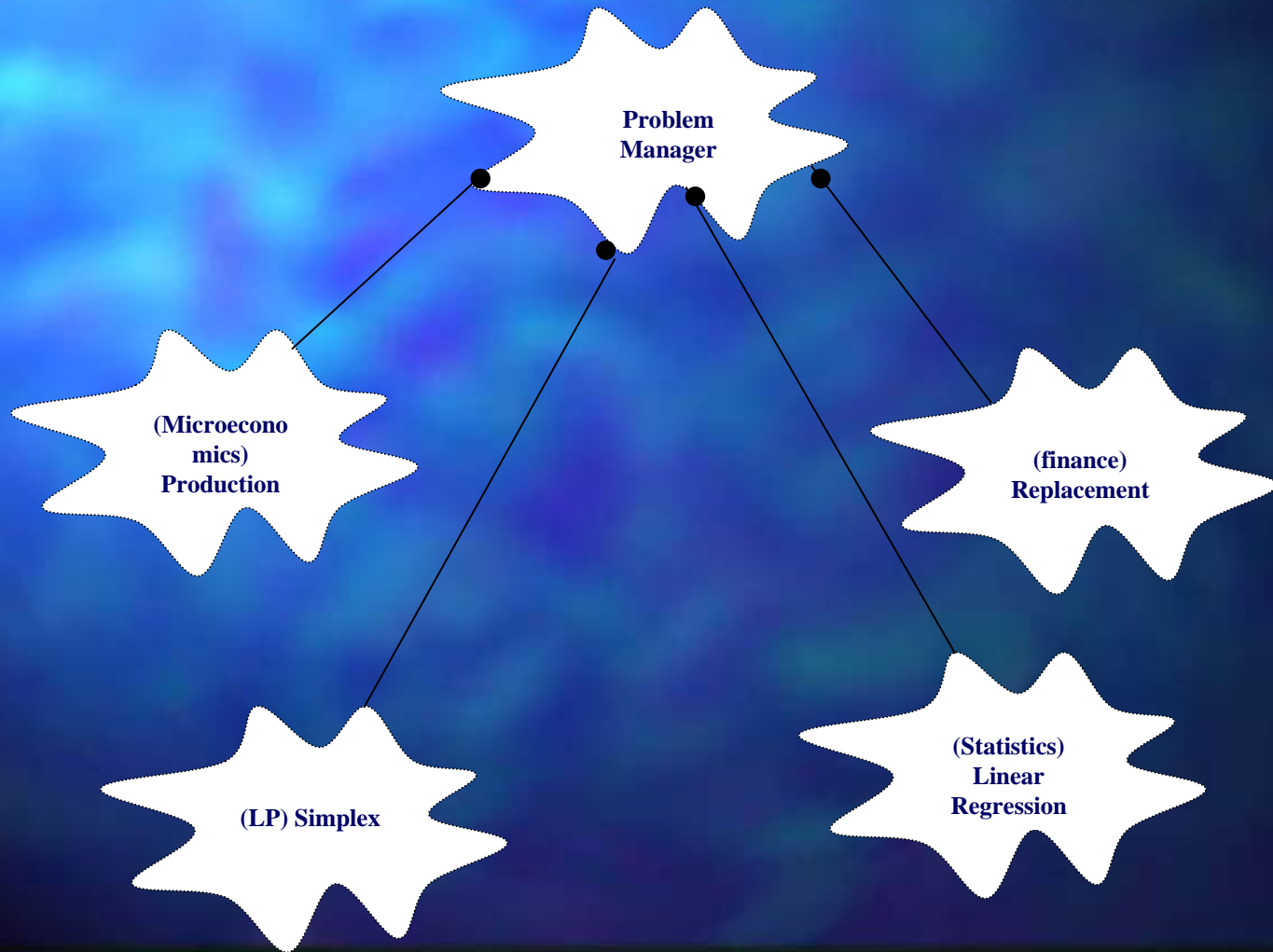
Design Diagrams (4)



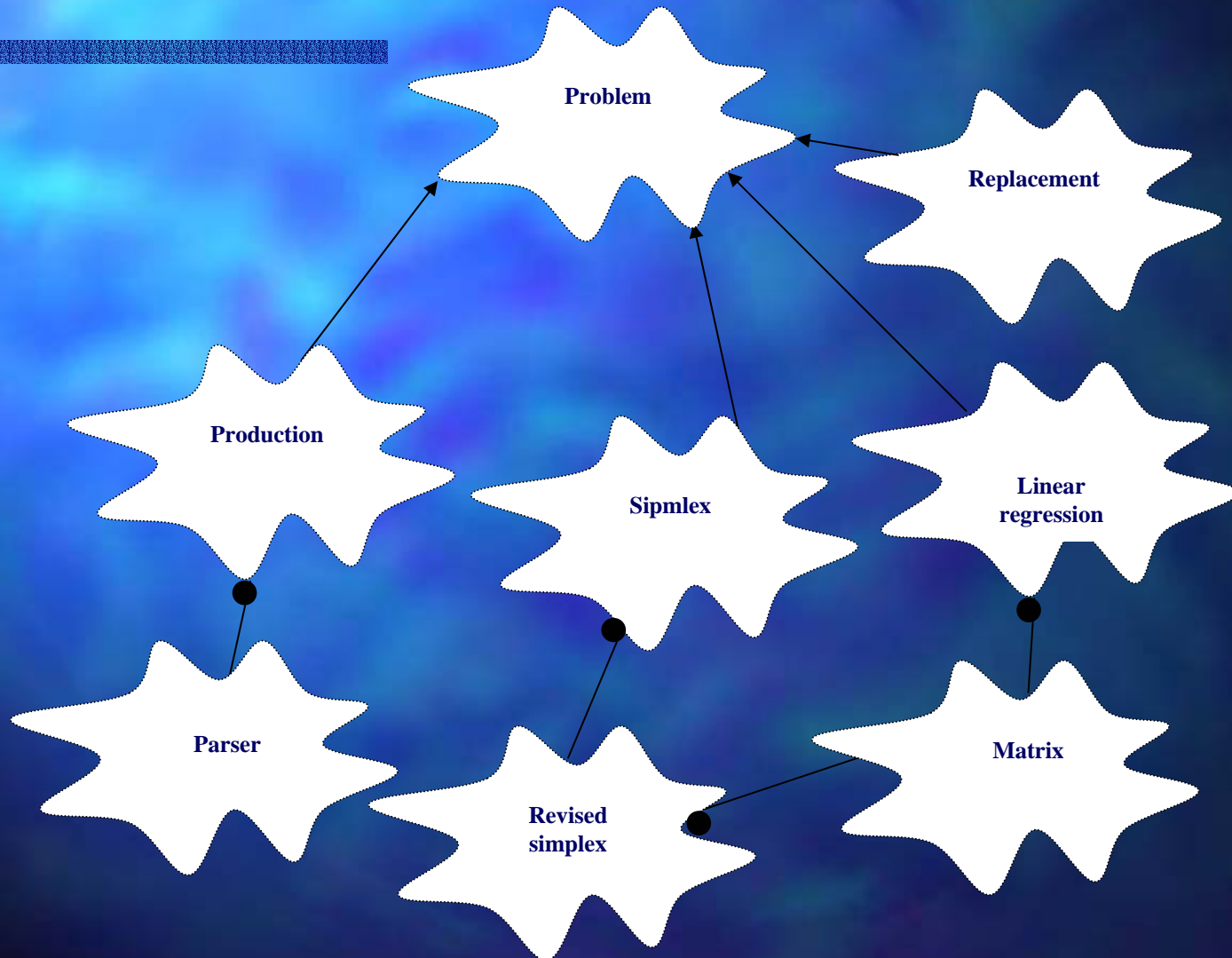
Design Diagrams (5)



Design Diagrams (6)



Design Diagrams (7)



Future Work

- Put on the web using applets and remote interfaces.
- More reusable classes.
- Enlarge the question types to handle string answers using artificial intelligence programs and concepts.
- Improve the tool by taking in consideration users feedback and needs.