The Hong Kong Polytechnic University
Department of Electronic and Information Engineering

GUI Design and Programming Mini-project

Software Learning Kit for Mentally Retarded Children Using Java Workshop 2.0

Software Project 1: Learn to Compare Object Size, Shape and Category

Working platform: Windows 95/98

Objectives: To compare the shape, size and category of different objects.

Optional Features: If possible, all instructions in the kit should be in Chinese or Cantonese.

Part I – Program Design

By using Java Workshop 2.0, design a standalone Java program that performs the tasks as specified below:

<table>
<thead>
<tr>
<th>Screen Display</th>
<th>Action</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Startup</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Show the startup screen which contains the PolyU logo and two buttons to start or to quit</td>
<td>Press Start button</td>
<td>Start the next screen</td>
</tr>
<tr>
<td></td>
<td>Press Quit button</td>
<td>Quit the application</td>
</tr>
<tr>
<td>2. TextArea to allow student to type his name for login and a “Enter” button.</td>
<td>Type student’s name and press enter (Each student should have a file to record down their previous results)</td>
<td>Start the next screen</td>
</tr>
<tr>
<td>3. Three buttons: (i) Introduction (ii) Exercise (iii) Previous Result</td>
<td>Press Introduction button</td>
<td>Start Introduction Phase</td>
</tr>
<tr>
<td></td>
<td>Press Exercise button</td>
<td>Start Exercise Phase</td>
</tr>
<tr>
<td></td>
<td>Press Previous Result button</td>
<td>Show previous results</td>
</tr>
</tbody>
</table>

**Introduction Phase**

1. For a group of around 12 objects (any object determined | Press return or press the mouse left button | Objects with the same category go together. Finally the screen |
by you, however real objects are preferred), randomly arrange them to show on the screen. Background music required

2. For a group of around 12 objects (any object determined by you, however real objects are preferred), randomly arrange them to show on the screen. Background music required

<table>
<thead>
<tr>
<th>Exercise Phase</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. For every exercise below, the performance of student should be logged in a file and shown when user presses the Result button on the Startup screen.</td>
</tr>
<tr>
<td>2. For each screen, there should be buttons that allow user to go from one exercise to another or back to the startup page.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Exercise I</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Select 6 objects from those used in Introduction. Show them on the screen. In those 6 objects, 2 of them belong to the same category. Take any one of these 2 objects and show on the other side of the screen. Generate voice to ask the student to find out the object that is of the same category of that object. Background music required</td>
</tr>
<tr>
<td>2. Repeat 1, however, in the 6 objects you selected, 3 of them belong to the same category. The student needs to find out all 3 objects.</td>
</tr>
</tbody>
</table>
3. Repeat 1, however, in the 6 objects you selected, 4 of them belong to the same category. The student needs to find out all 4 objects.

Exercise II

1. Select 6 objects from those used in Introduction. Show them on the screen. In those 6 objects, 2 of them belong to the same size. Take any one of these 2 objects and show on the other side of the screen. Generate voice to ask the student to find out the object that is of the same size of that object. Background music required

2. Repeat 1, however, in the 6 objects you selected, 3 of them belong to the same size. The student needs to find out all 3 objects.

3. Repeat 1, however, in the 6 objects you selected, 4 of them belong to the same size. The student needs to find out all 4 objects.

Exercise III

2. Select 6 objects from those used in Introduction. Show them on the screen. In those 6 objects, 2 of them belong to the same shape. Take any one of these 2 objects and show on the other side of the screen. Generate voice to ask the student to find out the object that is of the same shape of that object. Background music required

2. Repeat 1, however, in the 6 objects you selected, 3 of them belong to the same shape. The
student needs to find out all 3 objects.

3. Repeat 1, however, in the 6 objects you selected, 4 of them belong to the same shape. The student needs to find out all 4 objects.

Exercise IV

1. Two objects are shown on the screen. Generate voice to ask the student which one is bigger. Background music required

   Press the mouse left button when pointing to the picture of an object.

   For correct answer, sound is generated to congratulate the student.
   For wrong answer, another sound is generated and voice is then generated to ask the student to try again.

2. Repeat 1, however, generate voice to ask the student which object is longer.

3. Repeat 1, however, generate voice to ask the student which object is thicker.

4. Repeat 1, however, generate voice to ask the student which object is taller.

Part II – Report

Write a report of not less than 5 pages (excluding program codes) to describe how you write this program. Detail describe all techniques you use, any technical problems you encounter and any solutions you use to solve these problems. Describe your program using flow charts with verbal explanations. Attach your program as an appendix at the end of your report.

General Description

a. Each group should normally comprise 3 students. Each group should hand in

   i) both soft and hard copies of the report
   ii) a soft copy of the program

on or before 12 May 2000. A demonstration of the program to your classmate should be made on either one of the following dates: 16 May or 19 May.
b. It is very much preferred to use a word processing package to type your report. The contents of the report are most important. However, you should try your best to write clear, correct and good sentences.

c. Distribution of marks:  
   - Program design: 65%  
   - Report writing: 35%

d. The specification above only defines the fundamental requirements. You may add your own ideas to the program. But remember, your target is a group of mentally retarded children. Most of the programs require a certain amount of multimedia materials, such as, graphics, sound, animation, etc. You need to find your own way to get these materials (Try to search on the Internet before you give up).

e. There should be a clear and even allocation of tasks among group members. Each member will be individually assessed. Group member with larger contribution to the project will acquire higher marks. The task allocation strategy among group members should be clearly described in the report.

f. A prize will be given to the best project. Upon evaluation or modification, the program will be donated to a school for mentally retarded children.