CS-170-01

MathGame Project

Author: Xinyi Lu

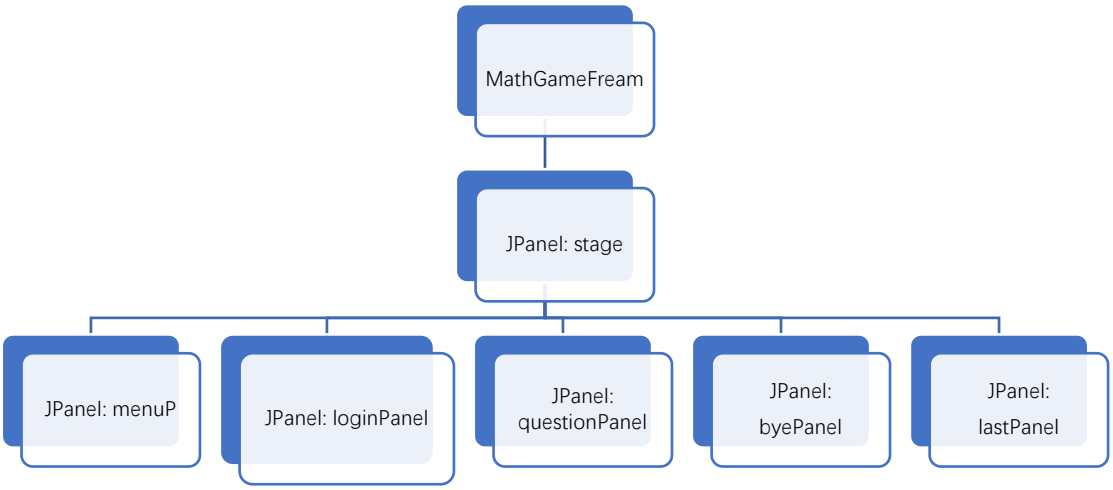
Date: 5/14/2021

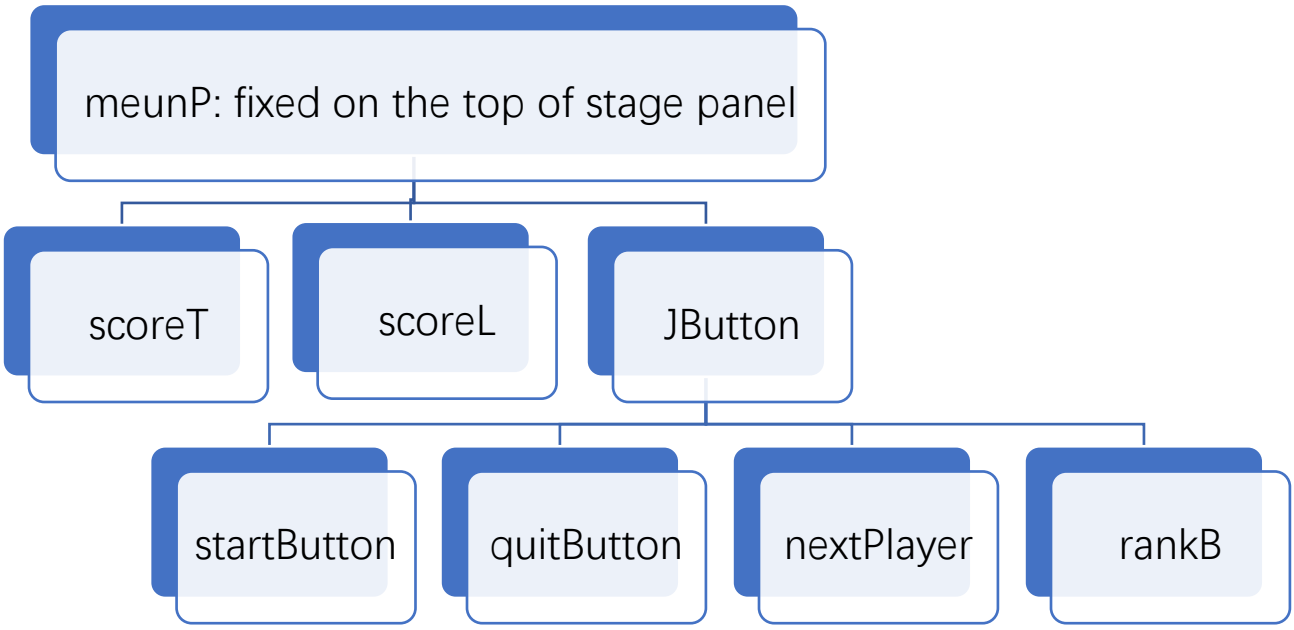
Project description:

MathGameFrame extends JFrame, implements ActionListener

Use GUI, graphics, colors, sounds, animations or images, event handling, exception handling, Layout managers, file I/O and other techniques covered in this course to develop math-learning program as an educational game for pre-school or first grade kids. The game should be interactive and display player' s names and scores. A file will store the top 5 player' s names and scores, and be displayed when a button is pressed any time during the game.

1. use HashMap store user name and related score
2. display 10 different simple math calculating questions and and let user input answers
3. checking answers and give point when answer is correct
4. let users choose to start game, quit game, let next users play and check score ranking





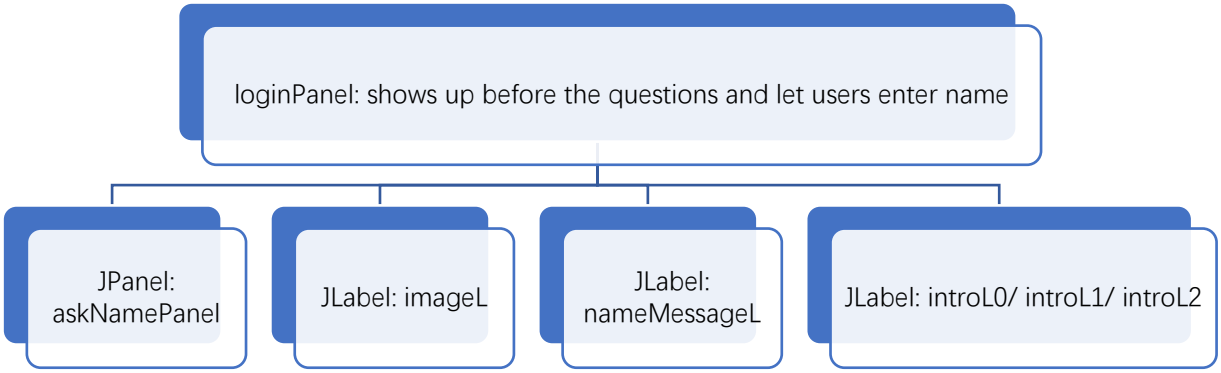
- **JButton actionPerformed: startButton & quitButton**
-

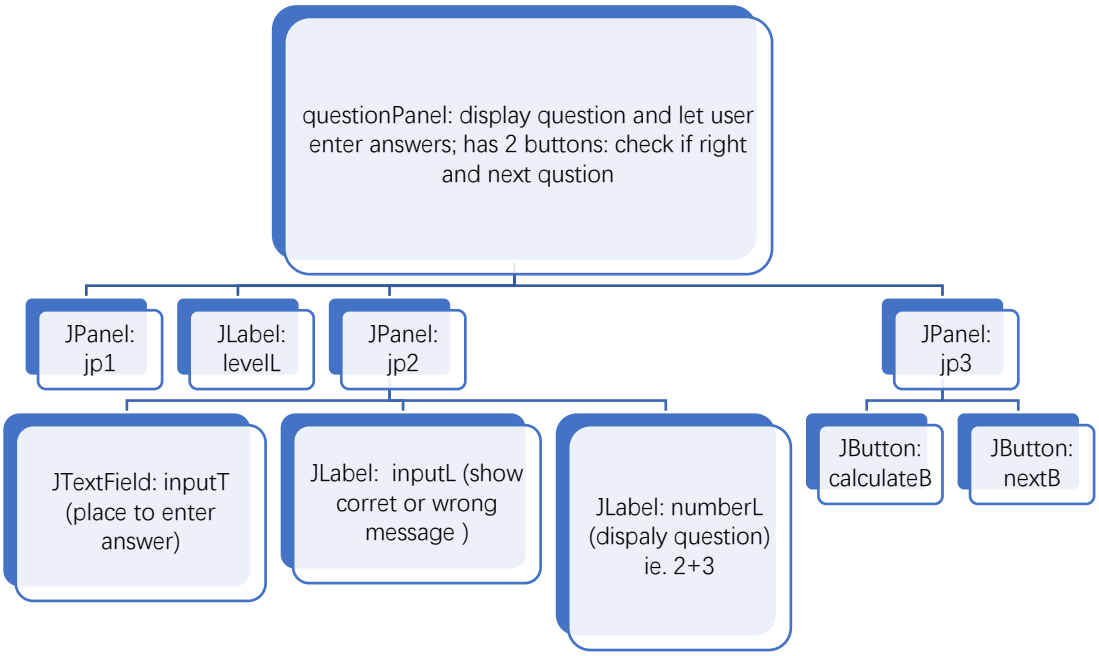
```
281          //when click start button
282          else if (button == startButton) {
283              //validate input is not empty
284              if (nameT.getText().trim().equals("") || nameT.getText().length() == 0) {
285                  nameMessageL.setText("Please enter your name to login first.");
286              } else {// jf.getText().trim().equals("")||jf.getText().length()==0
287                  nameMessageL.setText("Please enter your name to login first.");
288                  loginPanel.setVisible(false);
289                  lastPanel.setVisible(false);
290                  counter = 0;
291                  level = 1;
292                  score = 0;
293                  scoreT.setText(Integer.toString(score));
294                  generateRandomNumber(level);
295                  levelL.setText("Level - " + level);
296                  questionPanel.setLayout(new GridLayout(3, 1));
297                  stage.add(questionPanel, BorderLayout.CENTER);
298                  questionPanel.setVisible(true);
299              }
300          }
```

```
263          if (button == quitButton) {
264              loginPanel.setVisible(false);
265              lastPanel.setVisible(false);
266              questionPanel.setVisible(false);
267              stage.add(byePanel);
268              JOptionPane.showMessageDialog(null, "Thank you " + name + " for playing this game. ");
269              System.exit(0);
270          }
```

- JButton actionPerformed: nextPlayer & rankB

```
354         //when click "Score Rank"button
355         else if (button == rankB) {
356             String tempList = sorting();
357             display(tempList);
358         }
359         //when click Next Player button
360         else if (button == nextPlayerB) {
361             lastPanel.setVisible(false);
362             nameT.setText("");
363             loginPanel.setVisible(true);
364         } // end of all the situation of buttons actionPerformeds
365     }// End of method: public void actionPerformed(ActionEvent e)
366
```



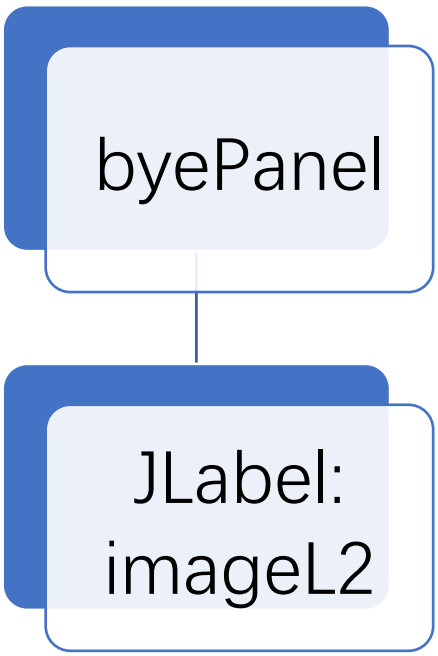


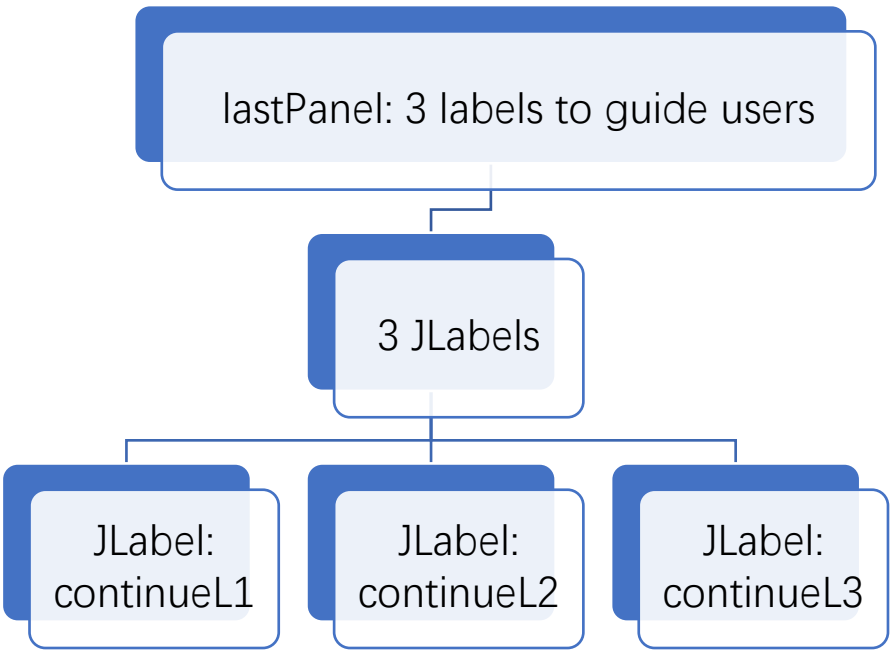
- **JButton actionPerformed: calculateB & nextB**

```
302         else if (button == calculateB) {
303
304             // Setting level constructor/ rules:
305             // 4 questions - level 2
306             // 6 questions - level 3
307             // 8 questions - level 4
308             // 10 questions - end of one round questions and display score result
309             // Checks if question counter is 3 set the level to 2
310
311             if (counter == 4)
312                 level = 2;
313
314             // Otherwise checks if question counter is 8 set the level to 3
315             else if (counter == 6)
316                 level = 3;
317
318             // Otherwise checks if question counter is 8 set the level to 4
319             else if (counter == 8)
320                 level = 4;
321
322             // Otherwise checks if question counter is 10 set the level to 1
323
324             // Set the level number in main label
325             levelL.setText("Level - " + level);
326
327             resultChecking();
328
329         }
330         //when click next button
331         else if (button == nextB) {
332             counter++;
333             if (counter == 11) { // limit the amount of questions to 10
334
335                 JOptionPane.showMessageDialog(null, name + ", your score is " + score, "Score Report",
336                         JOptionPane.INFORMATION_MESSAGE);
337                 // Clears the contents of result label and text field
338                 inputT.setText("");
339                 inputL.setText("");
340                 questionPanel.setVisible(false);
341                 lastPanel.setLayout(new GridLayout(3, 1));
342                 stage.add(lastPanel, BorderLayout.CENTER);
343                 lastPanel.setVisible(true);
344                 adding(); // add player name and score to hashmap
345             }
346             // Clears the contents of result label and text field
347             inputT.setText("");
348             inputL.setText("");
349
350 //Calls the method to generate question
351             generateRandomNumber(level);
352
353         }
```

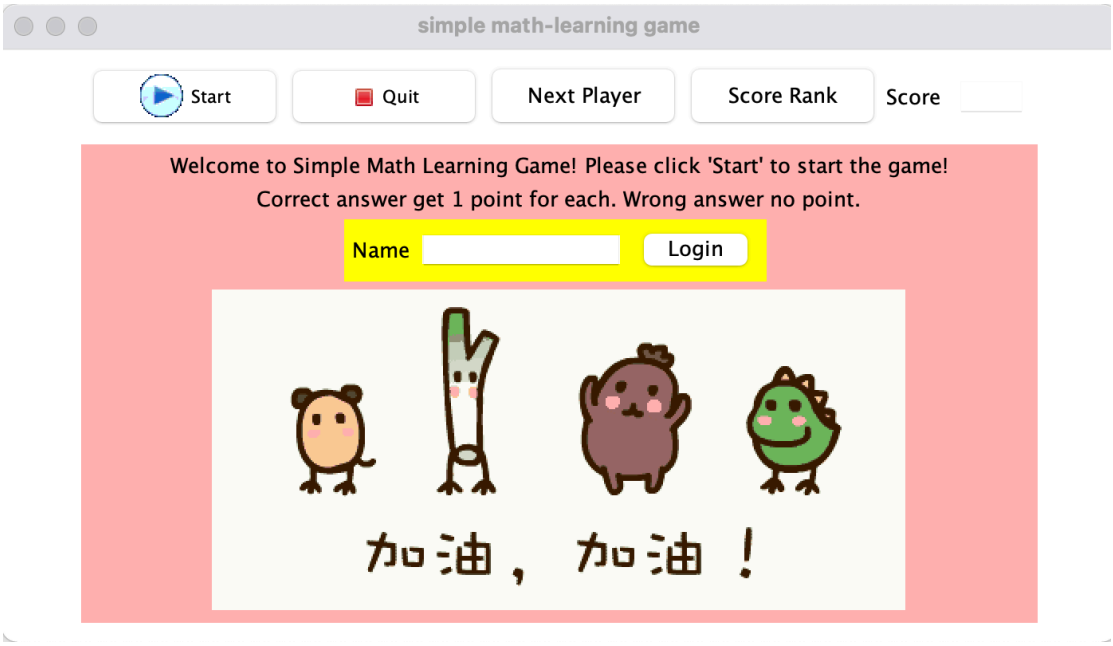
Method: resultChecking()

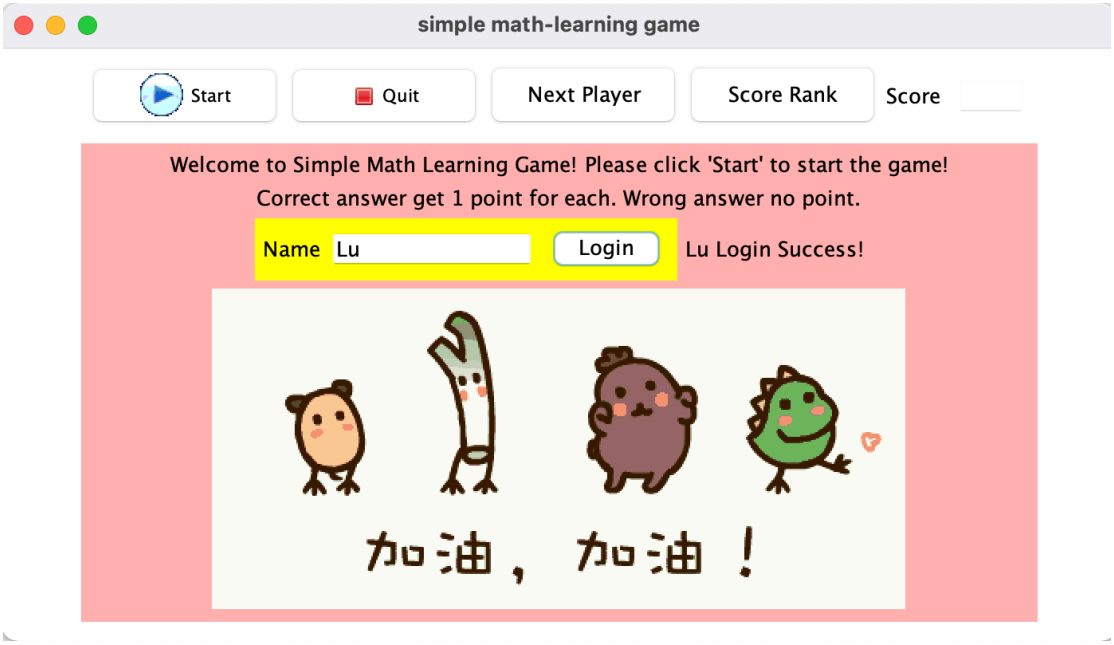
```
484
485     //method of checking if answer is correct
486     //if is correct, add 1 point
487     //if is wrong, give out correct answer and have no point
488     //play 2 sounds when get correct and wrong answers
489     public void resultChecking() {
490         if (counter < 11) {
491             try {
492                 // Checks if calculated result is equals to user entered answer
493                 if (result == Double.parseDouble(inputT.getText())) { // may throw to Exception e1
494
495                     // Increase the score by one
496                     score++;
497                     scoreT.setText(Integer.toString(score));
498
499                     inputL.setText("Correct Answer!");
500
501                     // Sets the congratulation message in result label
502                     try {
503                         music("music/cheer.wav");
504                     } catch (UnsupportedAudioFileException | LineUnavailableException e1) {
505                         // TODO Auto-generated catch block
506                         e1.printStackTrace();
507                     }
508
509                 } // End of if condition
510
511                 // Otherwise wrong answer
512                 else {
513                     try {
514                         music("music/error.wav");
515                     } catch (UnsupportedAudioFileException | LineUnavailableException e1) {
516                         // TODO Auto-generated catch block
517                         e1.printStackTrace();
518                     }
519                     // Sets the wrong message in result label and displays the correct answer
520                     inputL.setText("Sorry Wrong Answer" + "\n Correct Answer: " + result);
521                 }
522
523             } catch (Exception e1) {// Exception e1: handle input isn't number
524                 try {
525                     music("music/error.wav");
526                 } catch (UnsupportedAudioFileException | LineUnavailableException e2) {
527                     // TODO Auto-generated catch block
528                     e1.printStackTrace();
529                 }
530                 inputT.setText("");
531                 inputL.setText("Error! Please enter number.");
532             }
533         }
534
```

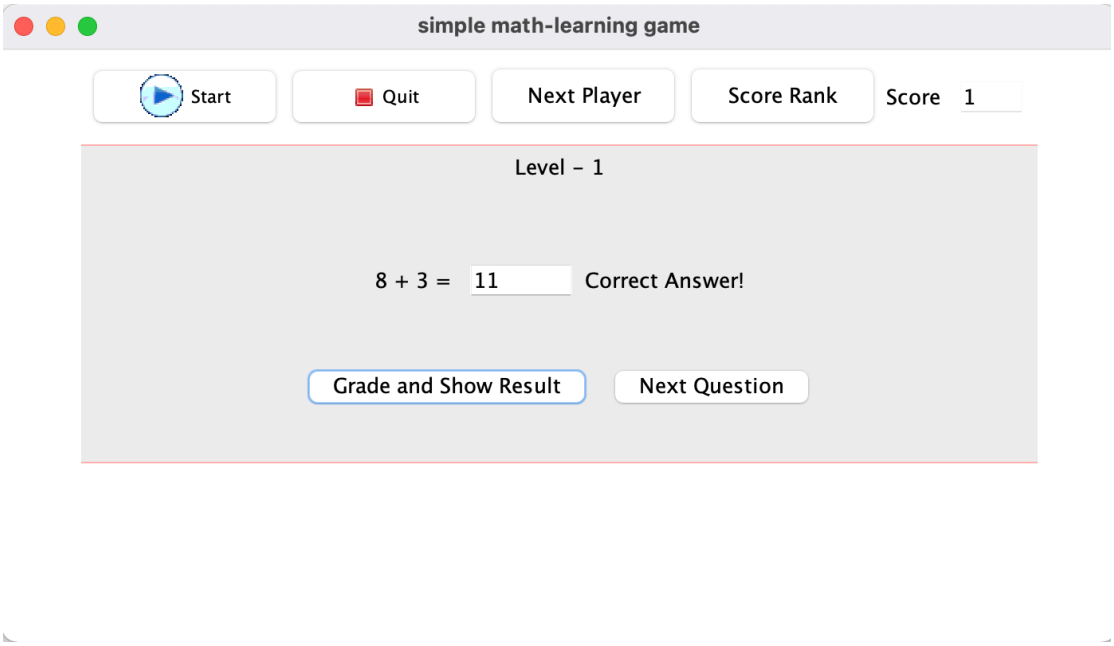


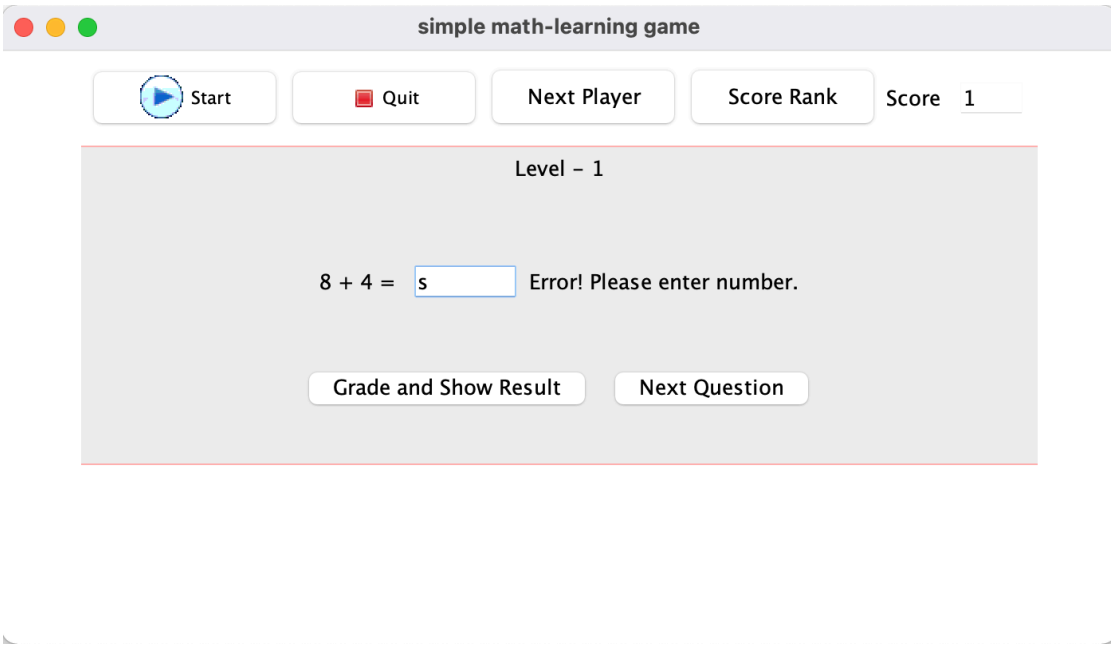

lastPanel: 3 labels to guide users
3 JLabels
JLabel: continueL1
JLabel: continueL2
JLabel: continueL3

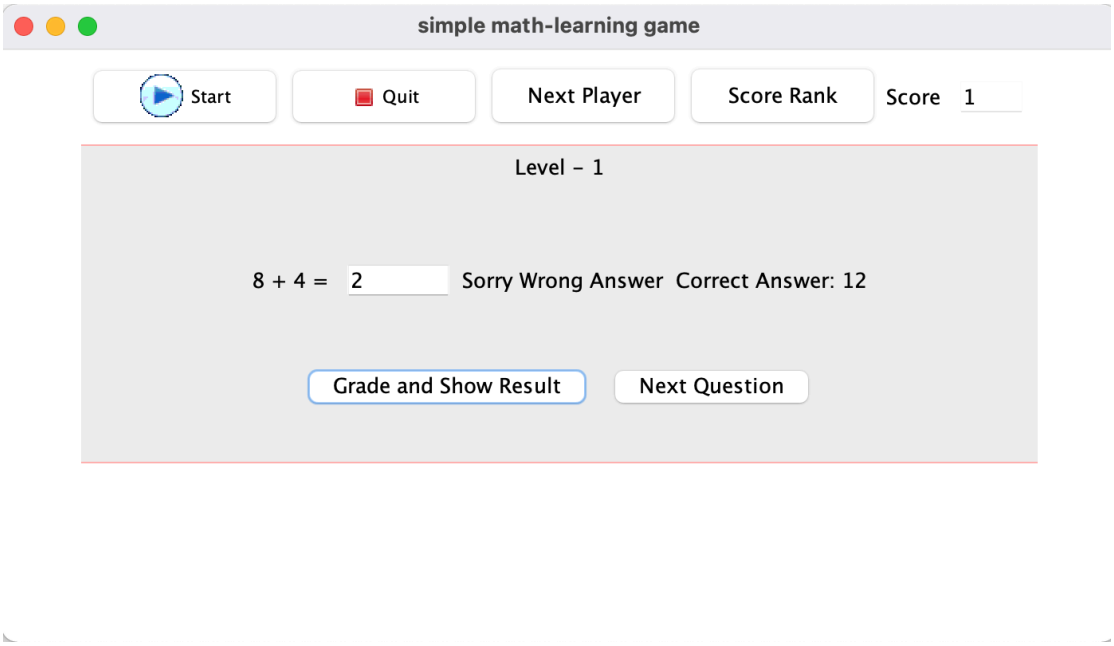
- Screen Shots:

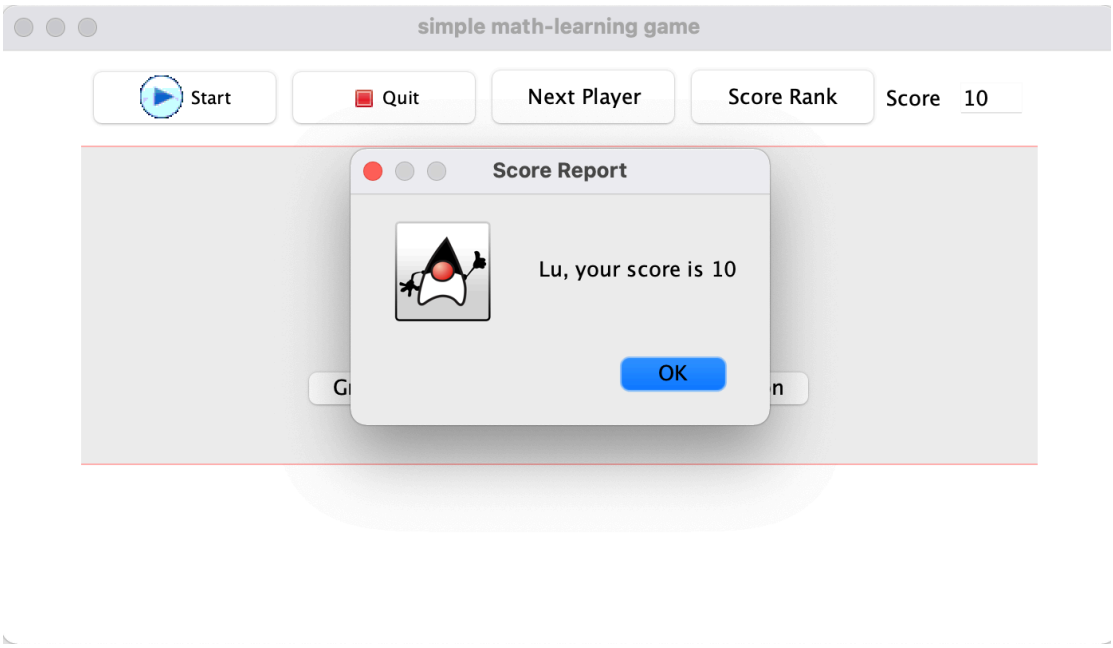


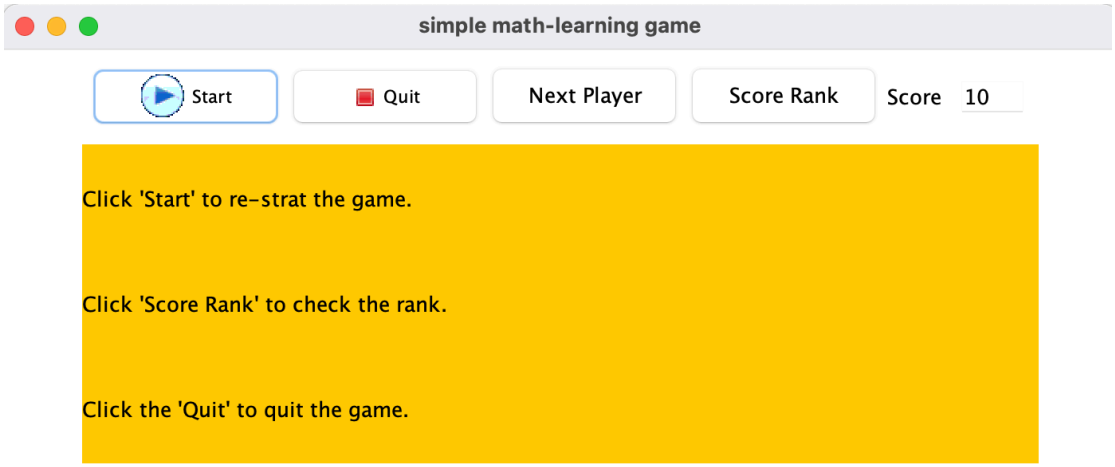


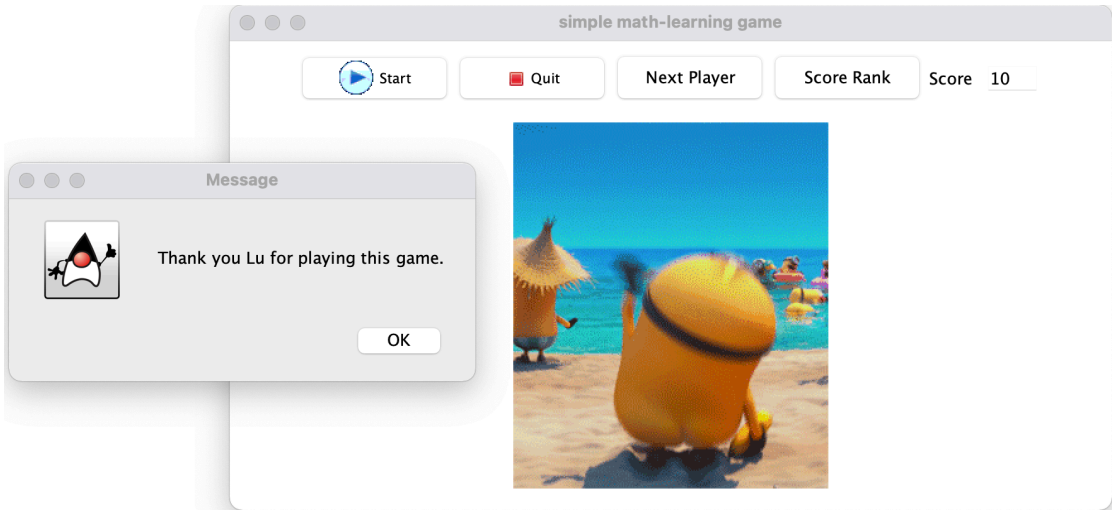

simple math-learning game
Start
Quit
Next Player
Score Rank
Score 1
Level – 1
8 + 3 = 11 Correct Answer!
Grade and Show Result
Next Question

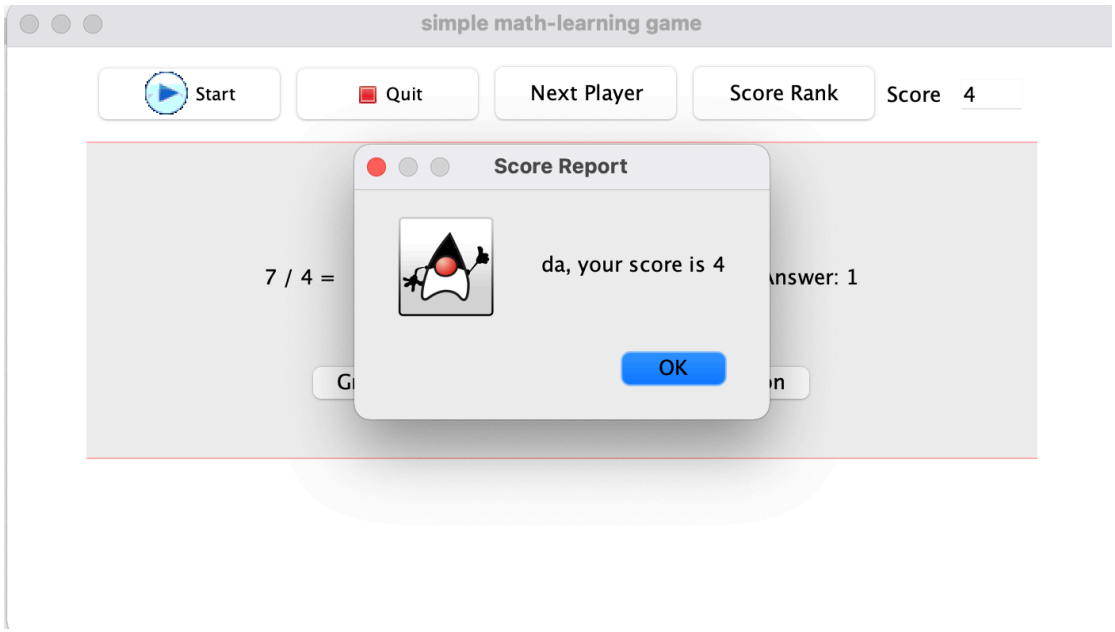

simple math-learning game
Start
Quit
Next Player
Score Rank
Score 1
Level – 1
8 + 4 = s Error! Please enter number.
Grade and Show Result
Next Question

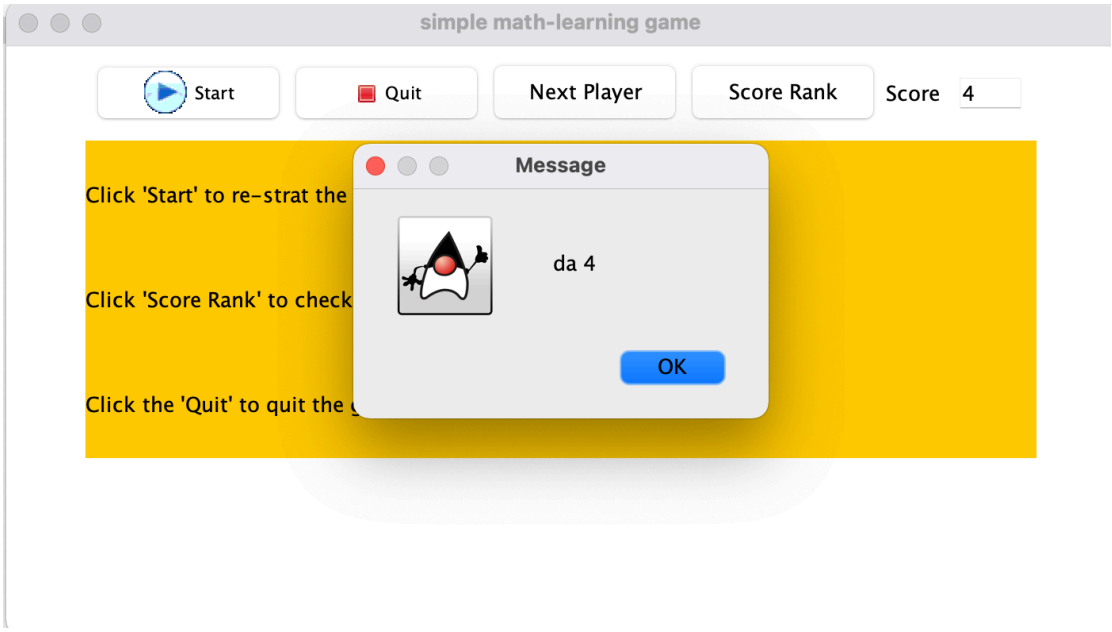

simple math-learning game
Start
Quit
Next Player
Score Rank
Score 1
Level – 1
8 + 4 = 2
Sorry Wrong Answer Correct Answer: 12
Grade and Show Result
Next Question

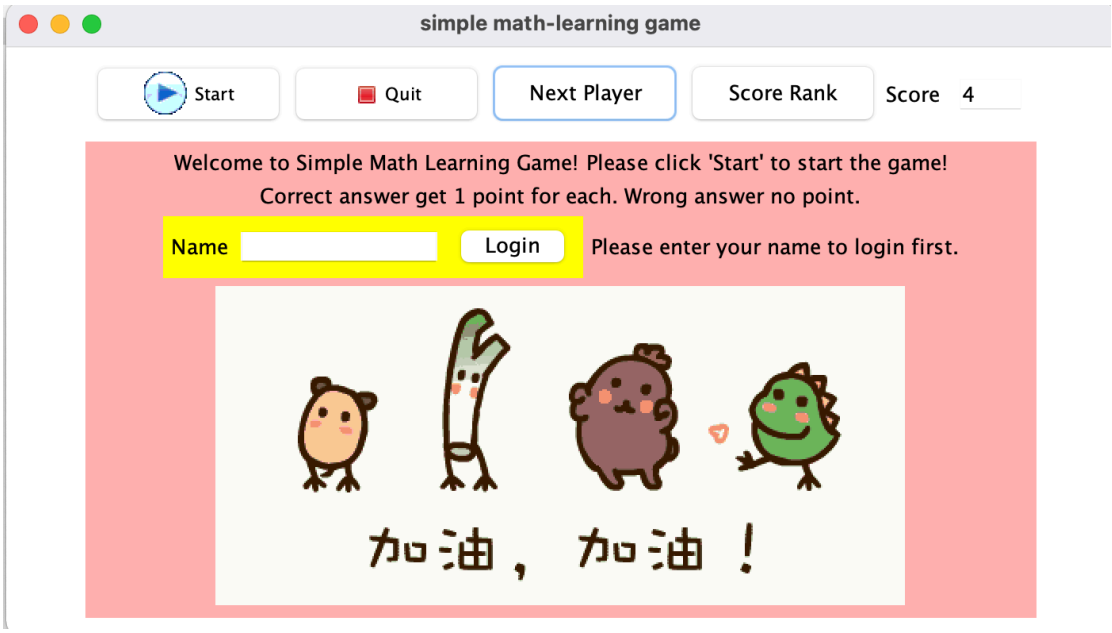

simple math-learning game
Start
Quit
Next Player
Score Rank
Score 10
Score Report
Lu, your score is 10
OK

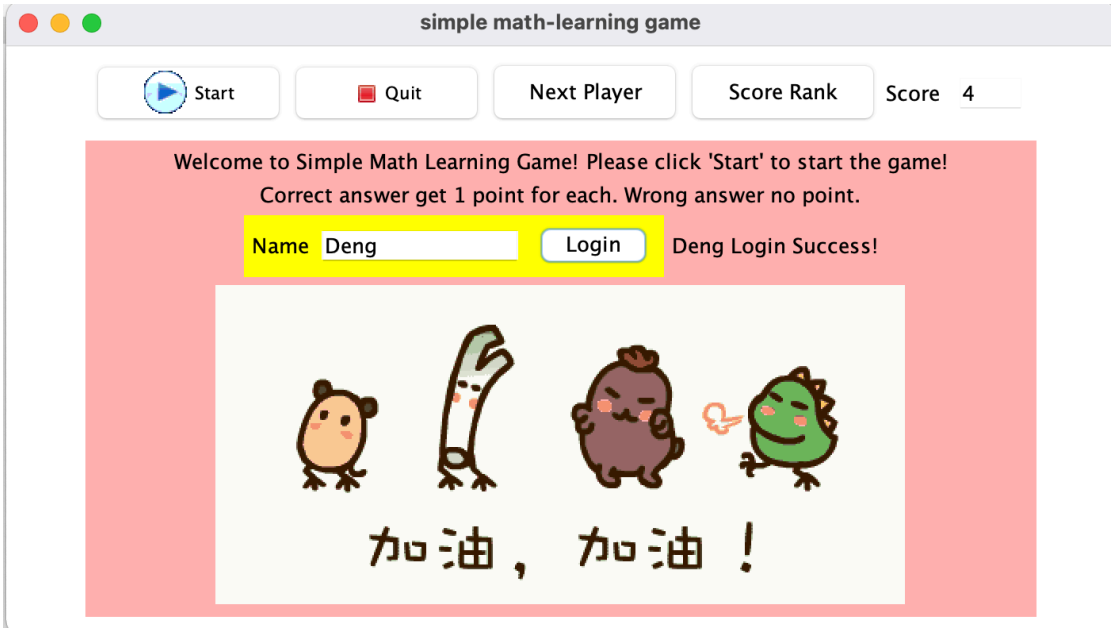

simple math-learning game
Start
Quit
Next Player
Score Rank
Score 10
Click 'Start' to re-strat the game.
Click 'Score Rank' to check the rank.
Click the 'Quit' to quit the game.

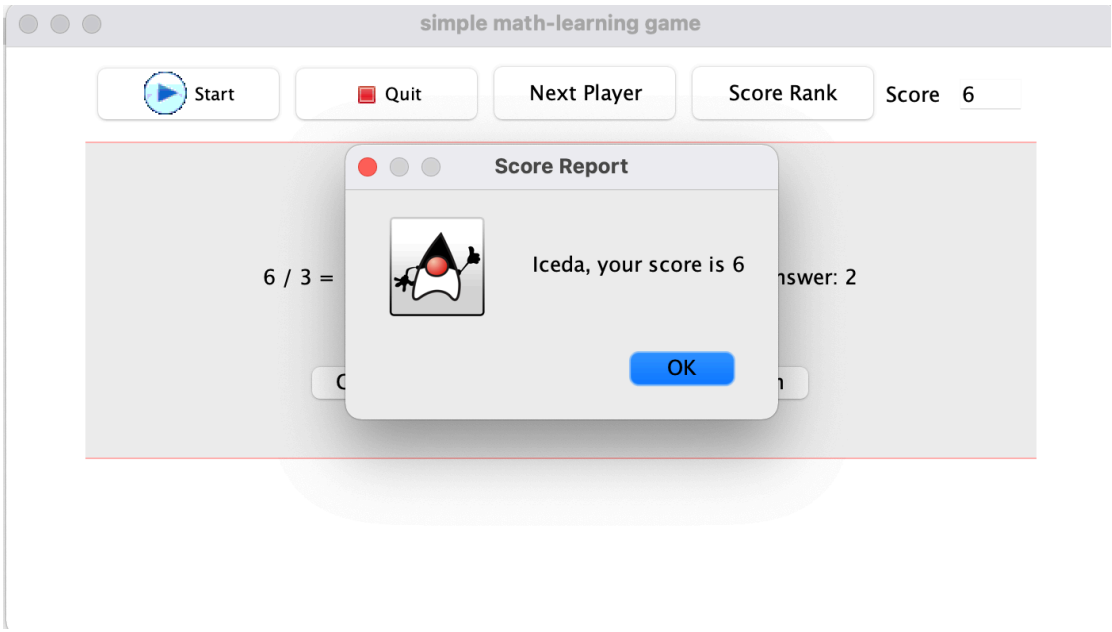

simple math-learning game
Start
Quit
Next Player
Score Rank
Score 10
Message
Thank you Lu for playing this game.
OK

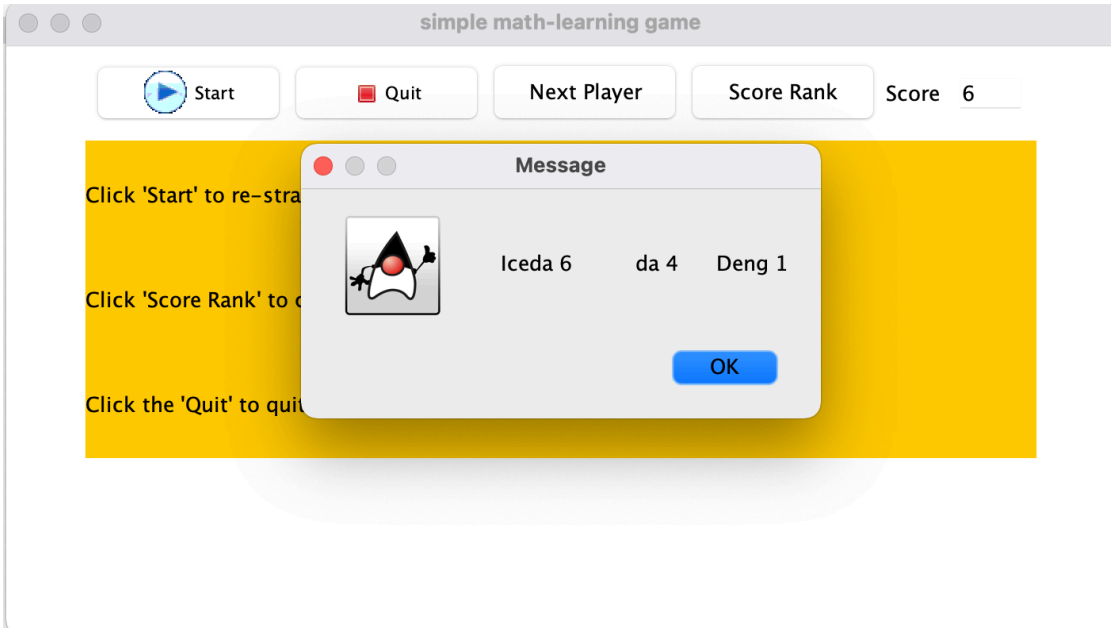

simple math-learning game
Start
Quit
Next Player
Score Rank
Score 4
Score Report
da, your score is 4
OK
7 / 4 =

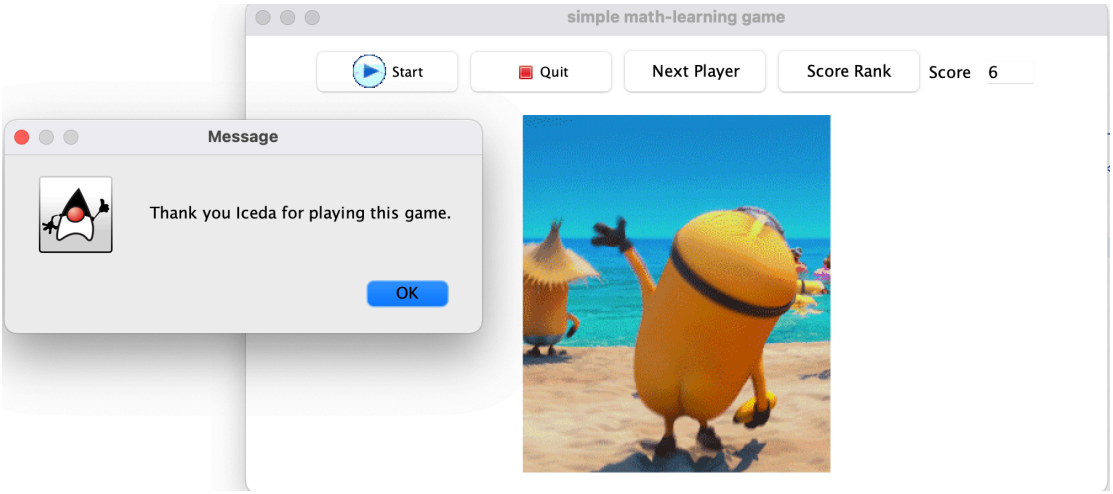

simple math-learning game
Start
Quit
Next Player
Score Rank
Score 4
Click 'Start' to re-strat the
Click 'Score Rank' to check
Click the 'Quit' to quit the
Message
da 4
OK


simple math-learning game
Start
Quit
Next Player
Score Rank
Score 4
Welcome to Simple Math Learning Game! Please click 'Start' to start the game!
Correct answer get 1 point for each. Wrong answer no point.
Name
Login
Please enter your name to login first.
加油，加油！


simple math-learning game
Start
Quit
Next Player
Score Rank
Score 4
Welcome to Simple Math Learning Game! Please click 'Start' to start the game!
Correct answer get 1 point for each. Wrong answer no point.
Name Deng
Login
Deng Login Success!
加油，加油！


simple math-learning game
Start
Quit
Next Player
Score Rank
Score 6
Score Report
Iceda, your score is 6
OK
6 / 3 =
nswer: 2


simple math-learning game
Start
Quit
Next Player
Score Rank
Score 6
Click 'Start' to re-stra
Click 'Score Rank' to
Click the 'Quit' to qui
Message
Iceda 6
da 4
Deng 1
OK


simple math-learning game
Start
Quit
Next Player
Score Rank
Score 6
Message
Thank you Iceda for playing this game.
OK