

THE UNIVERSITY OF AUCKLAND

SECOND SEMESTER, 2009
Campus: Tamaki

Computer Science

TEST

Software Design and Construction

(Time Allowed: 50 MINUTES)

Note:

- The use of calculators is NOT permitted.
- Compare the exam version number on the Teleform sheet supplied with the version number above. If they do not match, ask the exam supervisor for a new sheet.
- Enter your name and student ID on the Teleform sheet. Your name should be entered left aligned. If your name is longer than the number of boxes provided, truncate it.
- Answer all **Multiple-choice** questions on the Teleform answer sheet provided. Answer Section C in the space provided in this booklet. Attempt all questions.
- Use a dark pencil to mark your answers in the multiple choice answer boxes on the Teleform sheet. Check that the question number on the sheet corresponds to the question number in this question/answer book. If you spoil your sheet, ask the supervisor for a replacement.
- Write your answers in the space provided in the short answer section. Write as clearly as possible. The space provided will generally be sufficient but is not necessarily an indication of the expected length. Extra space is provided at the end of this exam book.
- An appendix with a simplified API is included on the last page.

Surname:	
First Name(s):	
Student ID:	
Login Name(UPI):	

MARKERS ONLY

Section	Marks	Of
A		40
B		35
C		25
Total		100

CONTINUED

SECTION A

The following FIVE questions relates to the classes given below:

```
class A {
    int x;

    A() { }

    A(int x) {
        this.x = x;
    }

    public String toString() {
        return "A:" + x;
    }
}
public class B extends A {
    int y = x+1;

    B() {}

    B(int y) {
        this.y = this.y + y;
    }

    B(int x, int y) {
        super(x);
        this.y = this.y + y;
    }

    public String toString() {
        return "B:(" + x + ", " + y + ")";
    }
}
```

Question 1

[1 mark] What will be printed after executing the following code fragment?

```
A a1 = new A();
System.out.println(a1);
```

- (a) B:1
- (b) A
- (c) A:1
- (d) B:0
- (e) A:0

Question 2

[2 marks] What will be printed after executing the following code fragment?

```
B b1 = new B();
System.out.println(b1);
```

- (a) B:(1,1)
- (b) B:(1,2)
- (c) B:(0,1)
- (d) B:(0,0)
- (e) A:1

Question 3

[1 mark] What will be printed after executing the following code fragment?

```
A a2 = new A(10);  
System.out.println(a2);
```

- (a) A:1
- (b) B:(0,10)
- (c) A:0
- (d) A:10
- (e) A:11

Question 4

[3 marks] What will be printed after executing the following code fragment?

```
B b2 = new B(10);  
System.out.println(b2);
```

- (a) B:(10,0)
- (b) B:(0,11)
- (c) B:(10,11)
- (d) B:(0,10)
- (e) B:(10,10)

Question 5

[3 marks] What will be printed after executing the following code fragment?

```
B b3 = new B(10, 100);  
System.out.println(b3);
```

- (a) B:(0,10)
- (b) B:(10,101)
- (c) B:(10,111)
- (d) B:(10,11)
- (e) B:(10,100)

The following THIRTEEN questions relates to the classes given below:

```
class A {  
    public String toString() {  
        return "A";  
    }  
}
```

```
class B extends A {  
    public String toString() {  
        return "B";  
    }  
}
```

```
class C extends B {  
    public String toString() {  
        return "C";  
    }  
}
```

```
class D extends B {  
    public String toString() {  
        return "D";  
    }  
}
```

```
class E extends A {  
    public String toString() {  
        return "E";  
    }  
}
```

```
}  
public class TestInstanceOf {  
    public static void main(String[] args) {  
        A a1 = new A();  
        B b1 = new B();  
        B b2 = new C();  
    }  
}
```

Question 6

[1 mark] What is the result of attempting to compile and run the following statement?

```
System.out.println("a1 instanceof A=" + (a1 instanceof A));
```

- (a) a1 instanceof A=true
- (b) a1 instanceof A=false
- (c) Run-time Error
- (d) Compile-time Error

Question 7

[1 mark] What is the result of attempting to compile and run the following statement?

```
System.out.println("a1 instanceof E = " + (a1 instanceof E));
```

- (a) Compile-time Error
- (b) Run-time Error
- (c) a1 instanceof E=false
- (d) a1 instanceof E=true

Question 8

[1 mark] What is the result of attempting to compile and run the following statement?

```
System.out.println("b1 instanceof B = " + (b1 instanceof B));
```

- (a) b1 instanceof B=true
- (b) Compile-time Error
- (c) Run-time Error
- (d) b1 instanceof B=false

Question 9

[1 mark] What is the result of attempting to compile and run the following statement?

```
System.out.println("b1 instanceof C=" + (b1 instanceof C));
```

- (a) Run-time Error
- (b) b1 instanceof C=false
- (c) Compile-time Error
- (d) b1 instanceof C=true

Question 10

[1 mark] What is the result of attempting to compile and run the following statement?

```
System.out.println("b1 instanceof D=" + (b1 instanceof D));
```

- (a) Compile-time Error
- (b) Run-time Error
- (c) b1 instanceof D=false
- (d) b1 instanceof D=true

Question 11

[1 mark] What is the result of attempting to compile and run the following statement?

```
System.out.println("b1 instanceof E=" + (b1 instanceof E));
```

- (a) b1 instanceof E=true
- (b) Compile-time Error
- (c) Run-time Error
- (d) b1 instanceof E=false

Question 12

[1 mark] What is the result of attempting to compile and run the following statement?

```
System.out.println("b2 instanceof B=" + (b2 instanceof B));
```

- (a) Run-time Error
- (b) b2 instanceof B=true
- (c) b2 instanceof B=false
- (d) Compile-time Error

Question 13

[1 mark] What is the result of attempting to compile and run the following statement?

```
System.out.println("b2 instanceof C=" + (b2 instanceof C));
```

- (a) Run-time Error
- (b) Compile-time Error
- (c) b2 instanceof C=false
- (d) b2 instanceof C=true

Question 14

[1 mark] What is the result of attempting to compile and run the following statement?

```
System.out.println("b2 instanceof D=" + (b2 instanceof D));
```

- (a) Run-time Error
- (b) b2 instanceof D=false
- (c) b2 instanceof D=true
- (d) Compile-time Error

Question 15

[1 mark] What is the result of attempting to compile and run the following statement?

```
System.out.println("b2 instanceof E=" + (b2 instanceof E));
```

- (a) Compile-time Error
- (b) b2 instanceof E=true
- (c) Run-time Error
- (d) b2 instanceof E=false

Question 16

[2 marks] What is the result of attempting to compile and run the following code fragment?

```
A a2 = (A) b2;
```

```
System.out.println(a2.toString());
```

- (a) A
- (b) C
- (c) Run-time Error
- (d) Compile-time Error

Question 17

[2 marks] What is the result of attempting to compile and run the following code fragment?

```
C c1 = (C) b1;
```

```
System.out.println(c1.toString());
```

- (a) B
- (b) Run-time Error
- (c) Compile-time Error
- (d) C

Question 18

[2 marks] What is the result of attempting to compile and run the following code fragment?

```
C c2 = (C) b2;  
System.out.println(c2.toString());
```

- (a) Compile-time Error
- (b) Run-time Error
- (c) B
- (d) C

The following TWO questions relates to the classes given below:

```
class A1 {  
    String s1 = "A1.s1";  
    String s2 = "A1.s2";  
}  
class B1 extends A1 {  
    String s1 = "B1.s1";  
  
    public static void main(String args[]) {  
        ...  
    }  
}
```

Question 19

[2 marks] What is the result of attempting to compile and run the following code fragment?

```
B1 x = new B1();  
System.out.println(x.s1+" "+x.s2);
```

- (a) Compile-time Error
- (b) Run-time Error
- (c) B1.s1 A1.s2
- (d) A1.s1 A1.s2
- (e) A1.s1 B1.s2

Question 20

[2 marks] What is the result of attempting to compile and run the following code fragment?

```
A1 y = (A1)x;  
System.out.println(y.s1+" "+y.s2);
```

- (a) Run-time Error
- (b) A1.s1 B1.s2
- (c) B1.s1 A1.s2
- (d) Compile-time Error
- (e) A1.s1 A1.s2

The following FOUR questions relates to the classes given below:

```
class G {  
    int x = 10;  
  
    void print() {  
        System.out.println("G.print," + x);  
    }  
  
    void method() {  
        System.out.print("G.method,");  
        this.print();  
    }  
}
```

```
class H extends G {
    int x = 20;

    void print() {
        System.out.println("H.print," + x);
    }

    public static void main(String[] args) {
        H h = new H();
        ...
    }
}
```

Question 21

[1 mark] What is the result of attempting to compile and run the following code fragment?

```
h.print();
```

- (a) Compile-time Error
- (b) G.print,10
- (c) H.print,20
- (d) Run-time Error

Question 22

[1 mark] What is the result of attempting to compile and run the following code fragment?

```
h.method();
```

- (a) Compile-time Error
- (b) G.print,10
- (c) G.method,G.print,10
- (d) G.method,H.print,20

Question 23

[1 mark] What is the result of attempting to compile and run the following code fragment?

```
G g1 = (G) h;
```

```
g1.print();
```

- (a) G.print,10
- (b) Compile-time Error
- (c) Run-time Error
- (d) H.print,20

Question 24

[1 mark] What is the result of attempting to compile and run the following code fragment?

```
G g2 = (G) h;
```

```
g2.method();
```

- (a) G.method,H.print,20
- (b) G.method,G.print,10
- (c) G.method,H.print,20
- (d) G.print,10

The following FOUR questions relates to the objects given below:

```
Integer a = new Integer(5);
Integer b = new Integer(2+3);
String s1 = "5";
String s2 = "5";
String s3 = new String("5");
String s4 = new String("5");
```

Question 25

[1 mark] What will be printed after executing the following code fragment?

```
System.out.print(a==b);
System.out.print(" and ");
System.out.print(a.equals(b));
```

- (a) true and false
- (b) false and false
- (c) false and true
- (d) true and true

Question 26

[2 marks] What will be printed after executing the following code fragment?

```
System.out.print(s1==s2);
System.out.print(" and ");
System.out.print(s1.equals(s2));
```

- (a) false and true
- (b) true and false
- (c) false and false
- (d) true and true

Question 27

[2 marks] What will be printed after executing the following code fragment?

```
System.out.print(s3==s4);
System.out.print(" and ");
System.out.print(s3.equals(s4));
```

- (a) false and false
- (b) false and true
- (c) true and true
- (d) true and false

Question 28

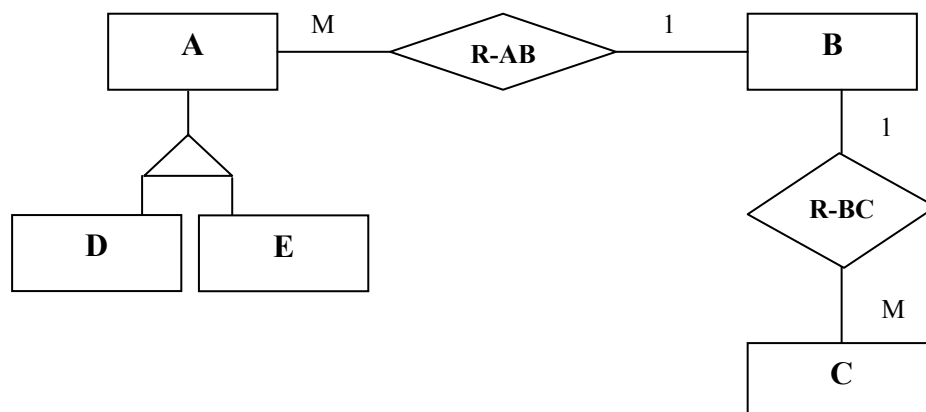
[1 mark] What will be printed after executing the following code fragment?

```
System.out.println(s1.equals(a));
```

- (a) false
- (b) Run-time Error
- (c) true
- (d) Compile-time Error

SECTION B

Use the ERD below for the following FOUR questions:



CONTINUED

Question 29

[3 marks] The ERD presented above corresponds in the relational model to a **maximum** of:

- (a) 7 Tables
- (b) 5 Tables
- (c) None of the others
- (d) 6 Tables

Question 30

[3 marks] Assume that the ERD shown above was 'translated' to the Relational model using the **maximum** possible number of Tables. How many Entity constraints should be present in this Relational model?

- (a) 9 Entity constraints
- (b) 8 Entity constraints
- (c) 10 Entity constraints
- (d) 7 Entity constraints

Question 31

[3 marks] Assume that the ERD shown above was 'translated' to the Relational model using the **maximum** possible number of Tables. How many Referential Integrity Constraints should be present in this Relational model?:

- (a) 5 Referential Integrity constraints
- (b) 6 Referential Integrity constraints
- (c) 8 Referential Integrity constraints
- (d) 7 Referential Integrity constraints

Question 32

[3 marks] The ERD shown above corresponds in the relational model to a **minimum** of:

- (a) 5 Tables
- (b) 1 Table
- (c) None of the above
- (d) 3 Tables

Question 33

[3 marks] Assume that the ERD shown above was 'translated' to the Relational model using the **minimum** possible number of Tables. How many Entity constraints should be present in this Relational model?:

- (a) 6 Entity constraints
- (b) 5 Entity constraints
- (c) 4 Entity constraints
- (d) 3 Entity constraints

Question 34

[3 marks] Assume that the ERD shown above was 'translated' to the Relational model using the **minimum** possible number of Tables. How many Referential Integrity Constraints should be present in this Relational model?:

- (a) 4 Referential Integrity constraints
- (b) 2 Referential Integrity constraints
- (c) 3 Referential Integrity constraints
- (d) 1 Referential Integrity constraints

Question 35

[3 marks] The two most important integrity constraints that are part of the Relational Model are called:

- (a) Entity and Referential integrity constraints
- (b) Referential and Foreign key constraints
- (c) Primary key and Entity key constraints
- (d) Entity and Identify constraints

Question 36

[3 marks] The reason why every M:N relationship in the ERD MUST be represented in the Relational model as a Table is because:

- The indices used by the Relational model work better when a M:N relationship is represented as a Table
- It looks better in the Relational model to represent a M:N relationship as a Table
- The Relational model does not enable the representation of multi-valued attributes
- This is how companies do it worldwide

Question 37

[2 marks] The reason why a 1:N (or 1:1) relationship in the ERD does not need to be represented in the Relational model as a Table is because:

- It looks better in the Relational model not use Tables to represent this relationship
- The indices used by the Relational model work better when this relationship is not represented as a Table
- A relationship containing at least one cardinality equal to 1 guarantees that there are no multi-valued attributes representing this relationship
- This is how companies do it worldwide

The following **TWO** questions are all based on the three Tables shown below. These tables store data on staff, the projects developed, and the relationship between staff and projects in which they work(ed):

ALL queries are to be executed using MySQL running on Windows

project table

ProjID	Description	Manager	StartDate	EndDate
PR1	Cold Fusion	BEBA	30-Mar-1999	30-Aug-1999
PR2	Yellow Submarine	BEBA	30-Mar-2000	30-Oct-2000
PR3	Coffe Cup	DOWN	14-Jan-2001	14-Dec-2001
PR4	Zip Zip	DOWN	23-May-2001	09-Jan-2002
PR5	Orfeu	CAST	17-May-1999	23-May-2001
PR6	Zone Alarm	CAST	09-Jan-2002	09-Dec-2002
PR7	Red Light	CAST	17-Jan-2001	09-Jan-2002
PR8	Sorbent	DOWN	21-May-1999	01-Jan-2001
PR9	Blue Moon	BEBA	01-Jan-2001	09-Jan-2002
PR10	Zoo	BEBA	18-Mar-1999	09-Jan-2002

staffproject table

ProjID	StaffID	dateWorked	nHours
PR1	BEBA	30-Mar-1999	2
PR1	ARPA	30-Mar-1999	3
PR1	BRAN	30-Mar-1999	2
PR1	CAST	30-Mar-1999	4
PR1	EWRI	30-Mar-1999	2
PR1	FOUS	30-Mar-1999	6
PR1	FOX1	30-Mar-1999	2
PR1	CHIN	30-Mar-1999	2
PR2	BEBA	30-Mar-2000	6
PR2	CHU1	30-Mar-2000	6
PR2	DUNT	30-Mar-2000	6
PR2	BROW	30-Mar-2000	6
PR2	BEBA	13-Mar-2000	6
PR2	BEBA	14-Mar-2000	6
PR2	BEBA	15-Mar-2000	6
PR2	BEBA	16-Mar-2000	6
PR3	ARPA	14-Jan-2001	8
PR4	DOWN	23-May-2001	8
PR5	CAST	17-May-1999	7
PR6	CAST	09-Jan-2002	8
PR7	CAST	17-Jan-2001	9
PR8	DOWN	21-May-1999	10
PR9	BEBA	01-Jan-2001	7
PR10	BEBA	18-Mar-1999	5

staff table

StaffID	SurName	Forename
ARON	Aronson	Larry
ARPA	Arpajian	Scott
BEBA	Bebak	Arthur
BRAN	Brandon	Bill
BROW	Brown	Mark
CAST	Castro	Elizabeth
CEAR	Cearly	Kent
CHIN	Chin	Francis
CHU1	Chu	Kenny
DOWN	Downing	Troy
DUNT	Duntemann	Jeff
EWRI	Erwin	Mike
EVAN	Evans	Tim
FOUS	Foust	Jeff
FOX1	Fox	David

Primary key for staff is StaffID
Primary key for project is ProjID
Primary key for staffproject is StaffID + ProjID + DateWorked

CONTINUED

Question 38

[3 marks] What is the SQL statement that answers the following question:

What are the full names of those staff who work(ed) in the projects that started after March 30th 1999?

- (a) None of the others
- (b) Select distinct Forename, Surname
From staff, project, staffproject
Where staff.StaffID = staffproject.StaffID AND
project.ProjID = staffproject.ProjID AND
StartDate > '1999-03-30'
- (c) Select distinct Forename, Surname
From staff, project, staffproject
Where staff.StaffID = staffproject.StaffID AND
project.ProjID = staffproject.ProjID
- (d) Select distinct Forename, Surname
From staff, project, staffproject
Where StaffID = StaffID AND ProjID = ProjID AND
StartDate > '1999-03-30'

Question 39

[3 marks] What is the SQL statement that answers the following question:

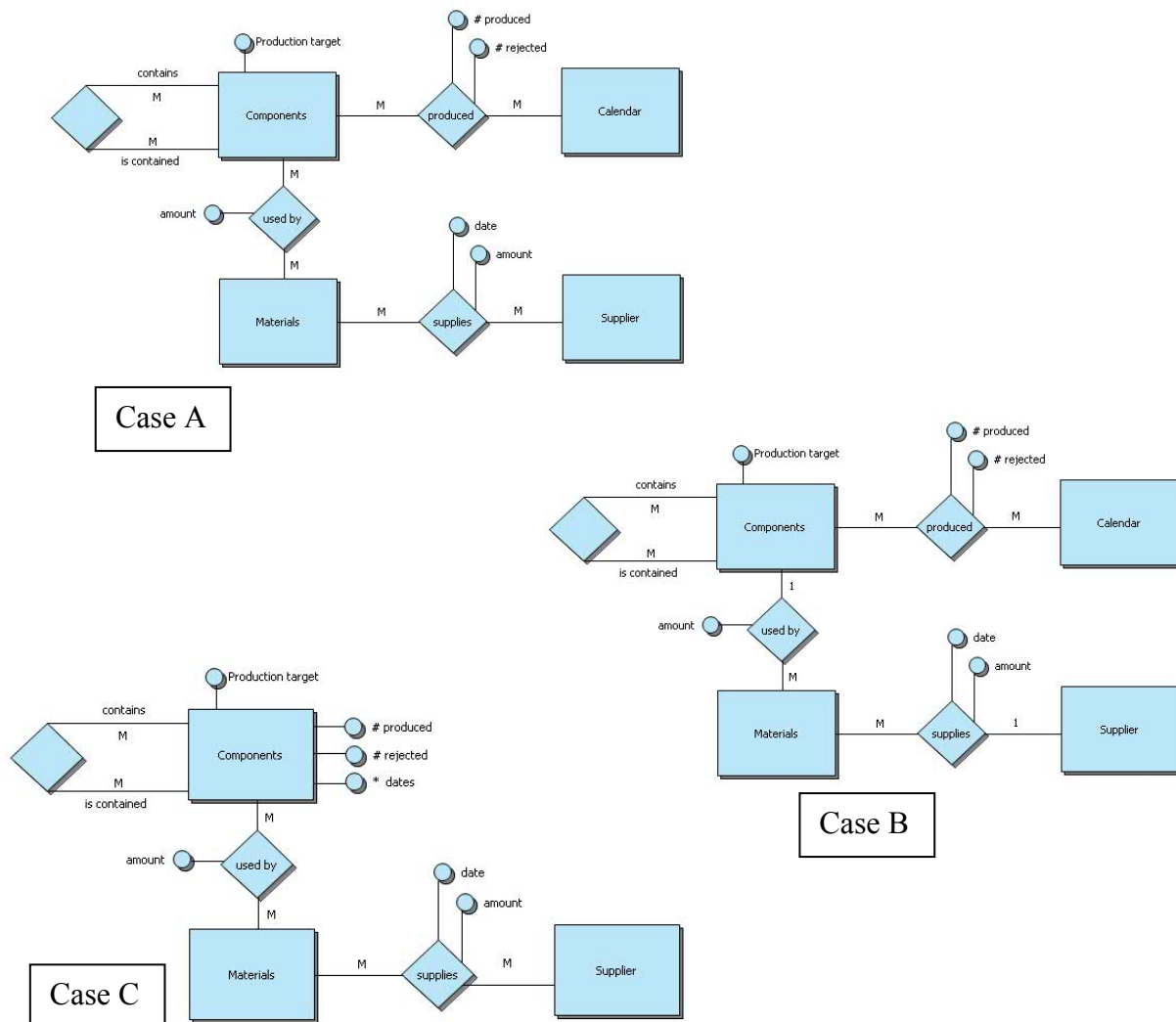
What are the descriptions of the projects managed by Elizabeth Castro?

- (a) Select Description
From staff, project, staffproject
Where staff.StaffID = staffproject.StaffID AND
SurName = 'Castro' AND Forename = 'Elizabeth'
- (b) Select Description
From staff, project
Where StaffID = Manager AND
SurName = 'Castro' AND Forename = 'Elizabeth' AND
staff.StaffID = staffproject.StaffID
- (c) Select Description
From staff, project
Where StaffID = Manager AND
SurName = 'Castro' AND Forename = 'Elizabeth'
- (d) Select Description
From staff, project, staffproject
Where staff.StaffID = staffproject.StaffID AND
project.ProjID = staffproject.ProjID AND
SurName = 'Castro' AND Forename = 'Elizabeth'

PartsRUs Inc. is a manufacturer of electronic components that are exported to numerous Customers in 15 different countries. It has its Headquarters (HQ) in Washington DC and branches in Singapore, Australia, England and Malaysia. Different manufacturing plants will manufacture a subset of the entire list of components that Components Inc. produces. Each plant records data on:

- i) the components it manufactures;
- ii) the number of components that are manufactured and rejected daily;
- iii) if a component contains another component(s) and which one(s);
- iv) if a component is contained within other(s) component(s) and which one(s);
- v) the materials and corresponding amount necessary to manufacturer a component;
- vi) the list of Suppliers, who supply materials;

vii) list of material(s) to be delivered to each plant by a supplier, the amount and on which date.
 Each plant has a production target for each component, i.e., the amount that should be produced daily, set by HQ every six months. Targets may change for each manufacturing plant.



Question 40

[3 marks] What is the ERD that best represents the situation detailed above?

- (a) Case C
- (b) Case A
- (c) None of the others
- (d) Case B

SECTION C

Answer all questions in this section in the space provided. If you run out of space then please use the Overflow Sheet and indicate in the allotted space that you have used the Overflow Sheet.

Question 41: Nested Classes

[10 marks]

Given the following program:

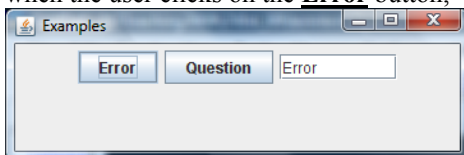
```
public class NestedDemo {
    JFrame frame;
    JTextField textfield;
    JButton error, question;

    public NestedDemo() {
        frame = new JFrame("Example");
        textfield = new JTextField("Demo Example ");

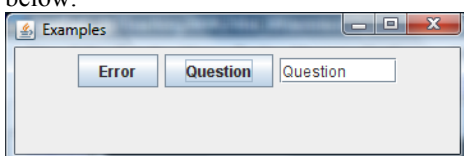
        error = new JButton("Error");
        error.addActionListener(new ActionListener() {
            public void actionPerformed(ActionEvent e) {
                textfield.setText(error.getText());
            }
        });
        question = new JButton("Question");
        question.addActionListener(new ActionListener() {
            public void actionPerformed(ActionEvent e) {
                textfield.setText(question.getText());
            }
        });
        Panel p = new Panel();
        p.add(error);
        p.add(question);
        p.add(textfield);
        frame.getContentPane().add(p);
        frame.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
        frame.setSize(400, 200);
        frame.setVisible(true);
    }

    public static void main(String[] args) {
        NestedDemo example = new NestedDemo();
    }
}
```

When the user clicks on the buttons, the text displayed on the button is shown on the textfield. For example, when the user clicks on the **Error** button, "**Error**" is shown on the textfield. The output is shown as below.



When the user clicks on the **Question** button, "**Question**" is shown on the textfield. . The output is shown as below.



Question/Answer Sheet

ID

Rewrite the two anonymous classes in the above program using a local inner class. A local inner class is a class defined within the body of a method.

```
public class NestedDemo2 {
    JFrame frame;
    JTextField textfield;
    JButton error, question;

    public NestedDemo2() {
        frame = new JFrame("Example");
        textfield = new JTextField("Demo Example ");
        error = new JButton("Error");
        question = new JButton("Question");
    }
}
```

```
class LocalClass implements ActionListener {

    public void actionPerformed(ActionEvent e) {
        if (e.getSource() instanceof JButton) {
            JButton b = (JButton) (e.getSource());

            textfield.setText(b.getText());

        }
    }
}
```

```
error.addActionListener(new LocalClass());
question.addActionListener(new LocalClass());
...
}
```

Hint: When the user clicks the onscreen button, the button fires an action event. This results in the invocation of the action listener's actionPerformed method. The single argument to the method is an ActionEvent object that gives information about the **event** and its **source**.

Object getSource()

Returns the object that fired the event.

Since the return type of getSource() is Object you typically use a type cast with it.

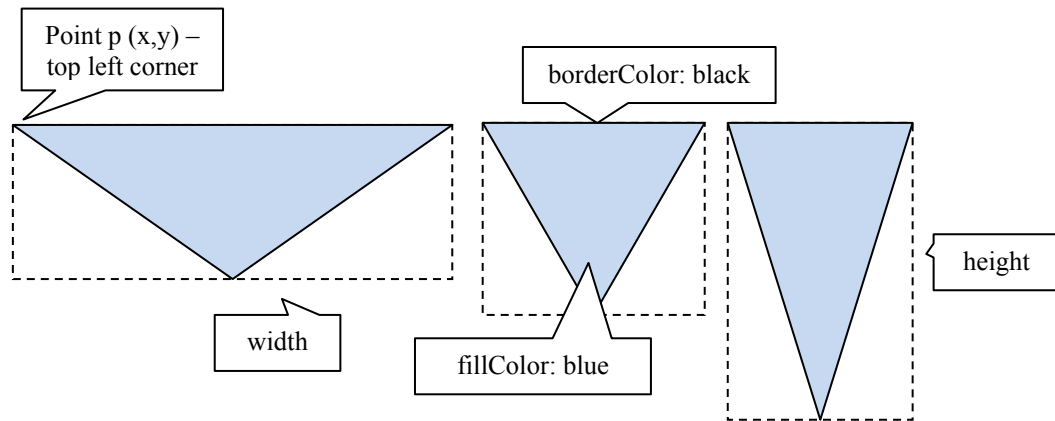
Question 42: Assignment 1

[15 marks]

In assignment 1, you were asked to add several changes to the program which displays moving shapes "bouncing" off the edges of the window. Create a new MovingTriangle class which draws a triangle on the window.

CONTINUED

Some examples are given below:



Given the following classes:

```
import java.awt.*;
public abstract class MovingShape {
    public int marginWidth, marginHeight; // the margin of the animation
    protected Point p; // the top left corner of the shapes
    protected int width, height; // the width and height of the shapes
    protected Color fillColor; // the fill colour of the shapes
    protected MovingPath path; // the moving path of the shapes
    protected boolean selected = false; // draw handles if selected
    protected Color borderColor; // the border colour of the shapes

    /** constructor to create a shape with default values
     */
    public MovingShape() {
        this(0, 0, 20, 20, 500, 500, Color.blue, Color.black, 0);
    }

    /** constructor to create a shape
     * @param x the x-coordinate of the new shape
     * @param y the y-coordinate of the new shape
     * @param w the width of the new shape
     * @param h the height of the new shape
     * @param mw the margin width of the animation panel
     * @param mh the margin height of the animation panel
     * @param c the colour of the new shape
     * @param typeOfPath the path of the new shape
     */
    public MovingShape(int x, int y, int w, int h,
        int mw, int mh, Color fc, Color bc, int pathType) {
        p = new Point(x,y);
        marginWidth = mw;
        marginHeight = mh;
        fillColor = fc;
        borderColor = bc;
        width = w;
        height = h;
        setPath (pathType);
    }

    public abstract boolean contains(Point p);
    public abstract void draw(Graphics g);

    public int getX() { return p.x; }
    public int getY() { return p.y; }
```

Question/Answer Sheet

ID

```
public boolean isSelected() { return selected; }
public void setSelected(boolean s) { selected = s; }
public void setWidth(int w) { width = w; }
public void setHeight(int h) { height = h; }
public void drawHandles(Graphics g) {
    // if the shape is selected, then draw the handles
    if (isSelected()) {
        g.setColor(Color.black);
        g.fillRect(p.x -2, p.y-2, 4, 4);
        g.fillRect(p.x + width -2, p.y + height -2, 4, 4);
        g.fillRect(p.x -2, p.y + height -2, 4, 4);
        g.fillRect(p.x + width -2, p.y-2, 4, 4);
    }
}
public void setFillColor(Color c) { fillColor = c; }
public void setBorderColor(Color c) { borderColor =c; }
public void move() {
    path.move();
}
...
}

import java.awt.*;
public class MovingRectangle extends MovingShape {
    public MovingRectangle() {
        super();
    }
    public MovingRectangle(int x, int y, int w, int h,
        int mw, int mh, Color fc, Color bc, int typeOfPath) {
        super(x,y,w,h,mw,mh,fc,bc, typeOfPath);
    }

    public void draw(Graphics g) {
        g.setColor(fillColor);
        g.fillRect(p.x, p.y, width, height);
        g.setColor(borderColor);
        g.drawRect(p.x, p.y, width, height);
        drawHandles(g);
    }

    public boolean contains(Point mousePt) {
        return (p.x <= mousePt.x && mousePt.x <= (p.x + width + 1) &&
            p.y <= mousePt.y && mousePt.y <= (p.y + height + 1));
    }
}
}
```

CONTINUED

Complete the class `MovingTriangle` below. Do not duplicate code unnecessarily.

```
import java.awt.*;
public class MovingTriangle extends MovingShape {

    public MovingTriangle() {
        super();
    }
    public MovingTriangle(int x, int y, int w, int h, int mw, int mh,
        Color fc, Color bc, int typeOfPath) {
        super(x,y,w,h,mw,mh,fc,bc, typeOfPath);
    }

    private Polygon createPolygon() {

        int[] xs = {p.x, (p.x+width), p.x+width/2 };

        int[] ys = {p.y, p.y, p.y+ height};

        Polygon poly = new Polygon(xs, ys, 3);

        return poly;
    }

    public void draw(Graphics g) {
        g.setColor(fillColor);
        Polygon poly = createPolygon();
        g.fillPolygon(poly);
        g.setColor(borderColor);
        g.drawPolygon(poly);
        drawHandles(g);
    }
    public boolean contains(Point mousePt) {
        return createPolygon().contains(mousePt);
    }
}
```

Question	Answer
1	E
2	C
3	D
4	B
5	C
6	A
7	C
8	A
9	B
10	C
11	B
12	B
13	D
14	B
15	A
16	B
17	B
18	D
19	C
20	E
21	C
22	D
23	D
24	C
25	C
26	D
27	B
28	A
29	A
30	D
31	B
32	D
33	D
34	B
35	A
36	C
37	C
38	B
39	C
40	B

APPENDIX

SELECT

```
[* | DISTINCT] select_expr, ...]
FROM table_references
[WHERE where_condition]
[GROUP BY {col_name}[ASC | DESC], ... ]
[HAVING where_condition]
[ORDER BY {col_name}[ASC | DESC], ...]
```

java.awt

class Graphics

```
void setColor(Color)
void drawLine(int, int, int, int)
void drawOval(int, int, int, int)
void drawPolygon(int[], int[], int)
void drawPolygon(Polygon)
void drawRect(int, int, int, int)
void fillOval(int, int, int, int)
void fillPolygon(int[], int[], int)
void fillPolygon(Polygon)
void fillRect(int, int, int, int)
```

class Polygon

```
Polygon(int[] xpoints, int[] ypoints, int npoints)
boolean contains(Point p)
boolean contains(int x, int y)
```

javax.swing.text

class JTextComponent

```
String getText()
void setText(String t)
```

java.lang

class Integer

```
boolean equals(Object obj)
```

class String

```
boolean equals(Object anObject)
```
