

A	12/1
B	12/1
C	1/1
D	1/1
E	1/1
F	12/1
H	1/1
G	1/1
J	1/1
main	0.5/1

Evidence  
A

```
public class A { //0.5
    private ArrayList<A> as; //0.5

    //0.2

    /**
     * @return the as
     */
    public ArrayList<A> getAs() {
        return as;
    }

    /**
     * @param as the as to set
     */
    public void setAs(ArrayList<A> as) {
        this.as = as;
    }

    public A(ArrayList<A> as) {
        this.as = as;
    }

    @Override
    public String toString() {
        return "A{" + "as=" + as + '}';
    }
}
```

B

```
public class B extends A { //0.5
    private ArrayList<H> hs; //0.5

    //0.2

    public B(ArrayList<A> as) {
        super(as);
        this.hs = hs;
    }

    @Override
    public String toString() {
        return "B{" + "hs=" + getHs() + '}';
    }

    /**
     * @return the hs
     */
    public ArrayList<H> getHs() {
        return hs;
    }

    /**
     * @param hs the hs to set
     */
    public void setHs(ArrayList<H> hs) {
        this.hs = hs;
    }
}
```

C

```
public class C extends A { //0.5
    ArrayList<E> es; //0.5

    public C(ArrayList<A> as) {
        super(as);
    }
}
```

D

```
public class D extends A { //0.5
    private E[] es = new E[5]; //0.25
    private ArrayList<F> fs; //0.25

    public D(ArrayList<A> as) {
        super(as);
    }
}
```

E

```
public class E { //1
    private List<C> relationC;
    private List<D> relationD;

    public E() {
        this.relationC = new ArrayList<>();
        this.relationD = new ArrayList<>();
    }

    public void addRelationC(C c) {
        relationC.add(c);
    }

    public void addRelationD(D d) {
        relationD.add(d);
    }
}
```

F

```
public class F { //1
    //0.2
    @Override
    public String toString() {
        return "F{" + '}';
    }
}
```

H

```
public interface H { //1
}
```

G

```
public class G implements H { //1
}
```

J

```
public class J { //1
}
```

main

```
public class ViewClass { //0.5

    public static void main(String[] args) {

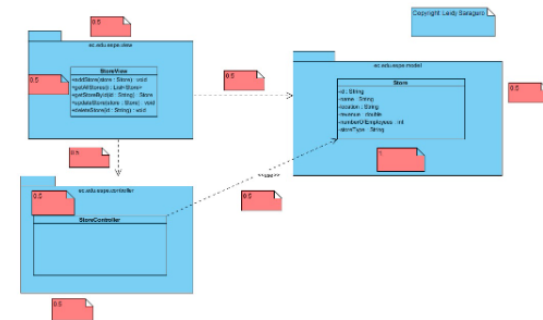
    }
}
```

# Rubric

120. MVC(design) 5/5
121. GUI(design) 5/5
122. MVC implementation: 5/5 pts
123. GUI implementation: 5/5 pts (Create: good use of widgets, read all: good use of tables, Find: showing results)
124. DB implementation: 5/5 pts.
125. Data persistence: 10/10 pts. (your application inserts into MongoDB Atlas, your application reads from MongoDB Atlas)
126. Clean code: 5/5 pts.

# Evidence

107. MVC(design)



108. GUI(design)

```

public class Store {
    private String id;
    private String name;
    private String location;
    private double revenue;
    private int numberOfEmployees;
    private String storeType;

    public Store(String id, String name, String location, double revenue, int numberOfEmployees, String storeType) {
        this.id = id;
        this.name = name;
        this.location = location;
        this.revenue = revenue;
        this.numberOfEmployees = numberOfEmployees;
        this.storeType = storeType;
    }

    public String getId() {
        return id;
    }

    public void setId(String id) {
        this.id = id;
    }

    public String getName() {
        return name;
    }

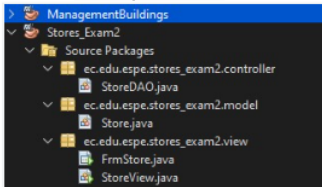
    public void setName(String name) {
        this.name = name;
    }

    public String getLocation() {
        return location;
    }
}

```

- Widgets:
- \* Data Grid
  - \* Num. Stepper
  - \* Button
  - \* Text Input
  - \* Text Label
  - \* Window

109. MVC implementation



110. GUI implementation

111. DB implementation

```

// Add Store
_id: ObjectId('66b0d61a66905628d1532ffc')
name: "Quevedo"
location: "Quevedo"
revenue: 70
numberOfEmployees: 10
storeType: "Online"

// Update Store
_id: ObjectId('66b0d61a66905628d1532ffc')
name: "Quevedo"
location: "Quevedo"
revenue: 70
numberOfEmployees: 10
storeType: "Online"

// Delete Store
_id: ObjectId('66b0d61a66905628d1532ffc')
name: "Quevedo"
location: "Quevedo"
revenue: 70
numberOfEmployees: 10
storeType: "Online"

```

112. Data persistence

Clean code