

```
1 class Volunteer extends Employee {
2     public Volunteer(String id) {
3         super(id);
4     }
5
6     public boolean isPayday(int dayOfMonth) throws IllegalArgumentException {
7         if(dayOfMonth < 1 || dayOfMonth > 30) {
8             throw new IllegalArgumentException("Day of Month should be a valid integer");
9         }
10        return false;
11    }
12
13    public double calculatePay() throws UnpayableEmployeeException {
14        throw new UnpayableEmployeeException("Volunteers don't receive any payment");
15    }
16
17    public double calculateDeductions() {
18        return 0;
19    }
20 }
```

```
1 import java.lang.Exception;
2 class UnpayableEmployeeException extends Exception {
3
4     public UnpayableEmployeeException(String message) {
5         super(message);
6     }
7 }
```

```
1 import java.util.*;
2 class PayrollDispositionImpl implements PayrollDisposition {
3     private Map<Employee, Double> payments;
4
5     public PayrollDispositionImpl() {
6         payments = new HashMap<>();
7     }
8
9     public void sendPayment(Employee empl, double payment) throws NullPointerException, IllegalArgumentException {
10         if(empl == null) {
11             throw new NullPointerException("Employee can't be null");
12         }
13         else if(payment <= 0.0) {
14             throw new IllegalArgumentException("Payment can't be zero or less");
15         }
16         payments.put(empl, payment);
17     }
18
19     public double getTotal() {
20         double t = 0;
21         for (double i : payments.values()){
22             t += i;
23         }
24         return t;
25     }
26
27     public double getAverage() {
28         if(payments.size() > 0) {
29             return getTotal() / payments.size();
30         }
31         return 0;
32     }
33
34     public Map<Employee, Double> getPayments() {
35         return payments;
36     }
37 }
```

```
1 interface PayrollDisposition {  
2     abstract void sendPayment(Employee empl, double payment) throws IllegalArgumentException;  
3 }
```

```
1 import java.util.List;
2 interface PayrollDB {
3     abstract public List<Employee> getEmployeeList();
4 }
```

```
1 import java.util.Map;
2 class Payroll {
3     private int payday;
4     private PayrollDisposition disposition;
5
6     public Payroll(PayrollDisposition disposition, int payday) throws NullPointerException, IllegalArgumentException {
7         if(disposition == null) {
8             throw new NullPointerException("Disposition can't be null");
9         }
10        if(payday < 1 || payday > 30) {
11            throw new IllegalArgumentException("Payday should be valid Integer");
12        }
13        this.disposition = disposition;
14        this.payday = payday;
15    }
16
17    public void doPayroll(PayrollDB db) {
18        for(Employee i: db.getEmployeeList()) {
19            if(i.isPayday(payday)) {
20                try {
21                    disposition.sendPayment(i, i.calculatePay() - i.calculateDeductions());
22                }
23                catch(Exception e) {}
24            }
25        }
26    }
27 }
```

```
1  abstract class Employee {
2      protected String id;
3
4      public Employee(String id) throws NullPointerException, IllegalArgumentException {
5          if(id == null) {
6              throw new NullPointerException("Employee must have an ID");
7          }
8          if(id.equals("")) {
9              throw new IllegalArgumentException("Employee ID can't be empty");
10         }
11         this.id = id;
12     }
13
14     public String getId() {
15         return id;
16     }
17
18     abstract boolean isPayday(int dayOfMonth) throws IllegalArgumentException;
19     abstract double calculatePay() throws UnpayableEmployeeException;
20     abstract double calculateDeductions();
21 }
```

```
1 class Appointee extends Employee {
2     private int payday;
3     private int hoursPerMonth;
4     private double payPerHour;
5
6     public Appointee( String id, int payday, int hoursPerMonth, double payPerHour) throws IllegalArgumentException {
7         super(id);
8         if(payPerHour <= 0.0 || payday < 1 || payday > 30 || hoursPerMonth <= 0) {
9             throw new IllegalArgumentException("faulty parameters were given to the Appointee constructor");
10        }
11        this.payday = payday;
12        this.hoursPerMonth = hoursPerMonth;
13        this.payPerHour = payPerHour;
14    }
15
16    public boolean isPayday(int dayOfMonth) throws IllegalArgumentException {
17        if(dayOfMonth < 1 || dayOfMonth > 30) {
18            throw new IllegalArgumentException("Day of Month should be a valid number");
19        }
20        if(payday == dayOfMonth) {
21            return true;
22        }
23        return false;
24    }
25
26    public double calculatePay() {
27        return hoursPerMonth * payPerHour;
28    }
29
30    public double calculateDeductions() {
31        return calculatePay() * 0.4;
32    }
33 }
```