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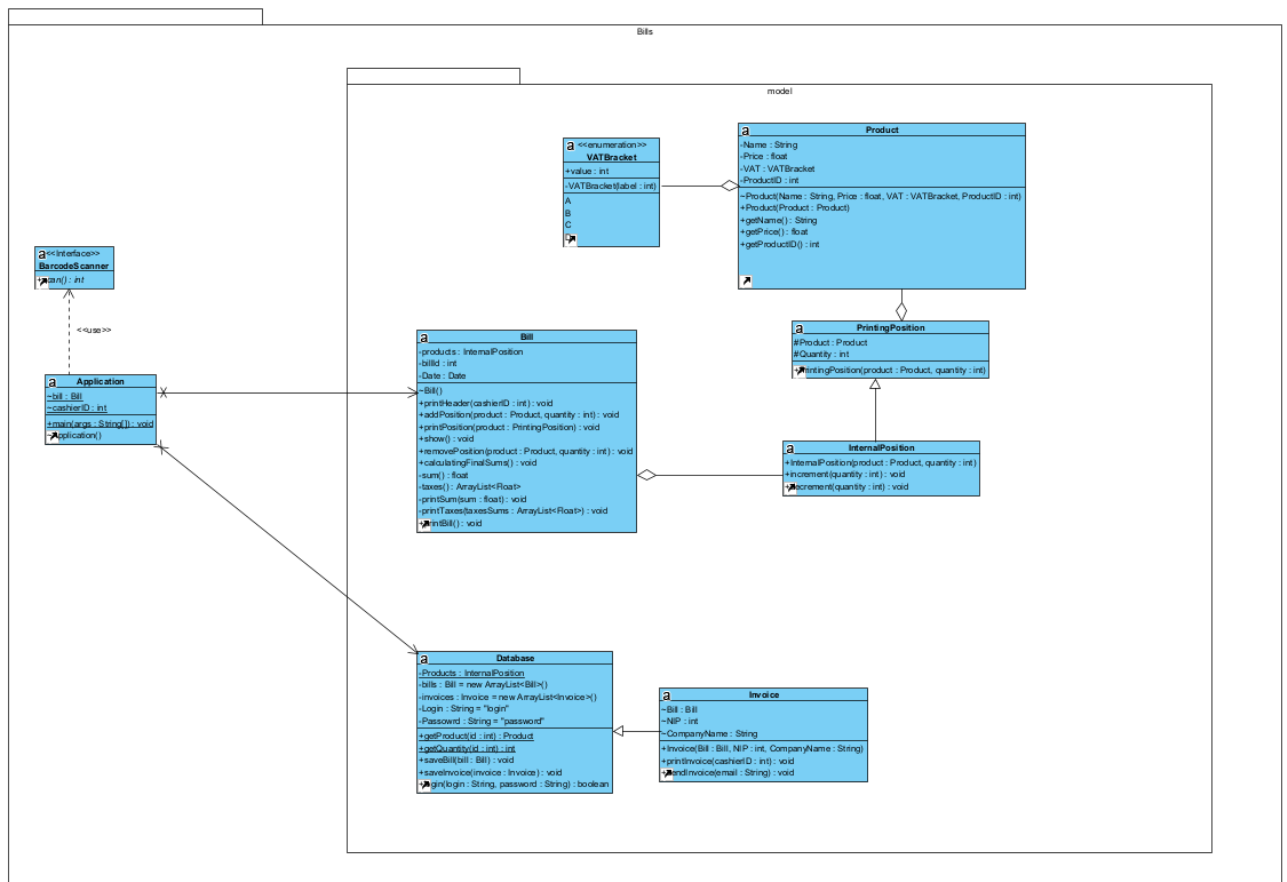
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Inżynieria oprogramowania – etapy 5-7 Program wystawiający rachunki

Spis treści

Diagram klas do poprawy	2
Struktura klas.....	3
Application.....	3
BarcodeScanner.....	3
VATBracket.....	3
PrintingPosition	3
Product	3
InternalPosition	4
Database.....	4
Invoice	4
Bill	6
Diagramy sekwencji.....	7
Diagram PU adding/removing a product.....	7
Subdiagram getProduct().....	8
Subdiagram addPosition()	9
Subdiagram removePosition()	10
Subdiagram printPosition().....	11
Diagram PU Finalizing the bill	12
Subdiagram taxes()	14
Uzyskany kod	15
BarcodeScanner.....	15
VATBracket.....	15
Invoice	15
PrintingPosition	15
Database.....	16
Bill	16
InternalPosition	19
Application.....	19
Product	19
Wyniki testów	20

Diagram klas do poprawy



Struktura klas

Application

```
public class Application {
    static Bill;
    static int cashierID;
    public static void main(String[] args){
    }
}
```

BarcodeScanner

```
public interface BarcodeScanner {
    public int scan();
}
```

VATBracket

```
public enum VATBracket {
    A(23),
    B(8),
    C(5),
    D(0);

    public final int value;
    private VATBracket(int label) {this.value = label;}
}
```

PrintingPosition

```
public class PrintingPosition {

    protected Product Product;
    protected int Quantity;

    public PrintingPosition(Product product, int quantity) {
        Product=product;
        Quantity=quantity;
    }
}
```

Product

```
public class Product {
    private String Name;
    private float Price;
    private VATBracket VAT;
    private int ProductID;

    Product(String Name, float Price, VATBracket VAT, int ProductID){
        this.Name=Name;
        this.Price=Price;
        this.VAT=VAT;
        this.ProductID=ProductID;
    }

    public Product(Product Product) {
        this.ProductID=Product.ProductID;
        this.Name=Product.Name;
    }
}
```

```

        this.VAT=Product.VAT;
        this.Price=Product.Price;
    }

    public String getName() {
        return Name;
    }
    public float getPrice() {
        return Price;
    }

    public VATBracket getVAT() {
        return VAT;
    }

    public int getProductID() {
        return ProductID;
    }

    public void setProductID(int ProductID) {
        this.ProductID=ProductID;
    }
}

```

InternalPosition

```

public class InternalPosition extends PrintingPosition {

    public InternalPosition(Product product, int quantity) {
        super(product, quantity);
    }

    public void increment(int quantity) {
        this.Quantity+=quantity;
    }
    public void decrement(int quantity) {
        this.Quantity-=quantity;
    }
}

```

Database

```

public class Database {
    private static ArrayList<InternalPosition> Products;
    private ArrayList<Bill> bills;
    private ArrayList<Invoice> invoices;
    public static Product getProduct(int id){null;}
    public static int getQuantity(int id){return 0;}

    public void saveBill(Bill bill){}
    public void saveInvoice(Invoice invoice){}
    public boolean login(String login, String password){ return false;}
}

```

Invoice

```

public class Invoice extends Bill {
    Bill Bill;
    int NIP;
    String CompanyName;
}

```

```
public Invoice(Bill Bill,int NIP,String CompanyName){  
    this.Bill=Bill;  
    this.NIP = NIP;  
    this.CompanyName = CompanyName;  
  
}  
  
public void printInvoice(int cashierID){}  
public void sendInvoice(String email){}  
  
}
```

Bill

```
import java.text.SimpleDateFormat;
import java.util.ArrayList;
import java.util.Date;
public class Bill {

    private ArrayList<InternalPosition> products;
    private int billId;
    private Date Date;

    Bill(){}

    public void printHeader(int cashierID){}
    public void addPosition(Product product, int quantity) {}

    public void printPosition(PrintingPosition product) {}

    public void show() {}

    public void removePosition(Product product, int quantity) {}

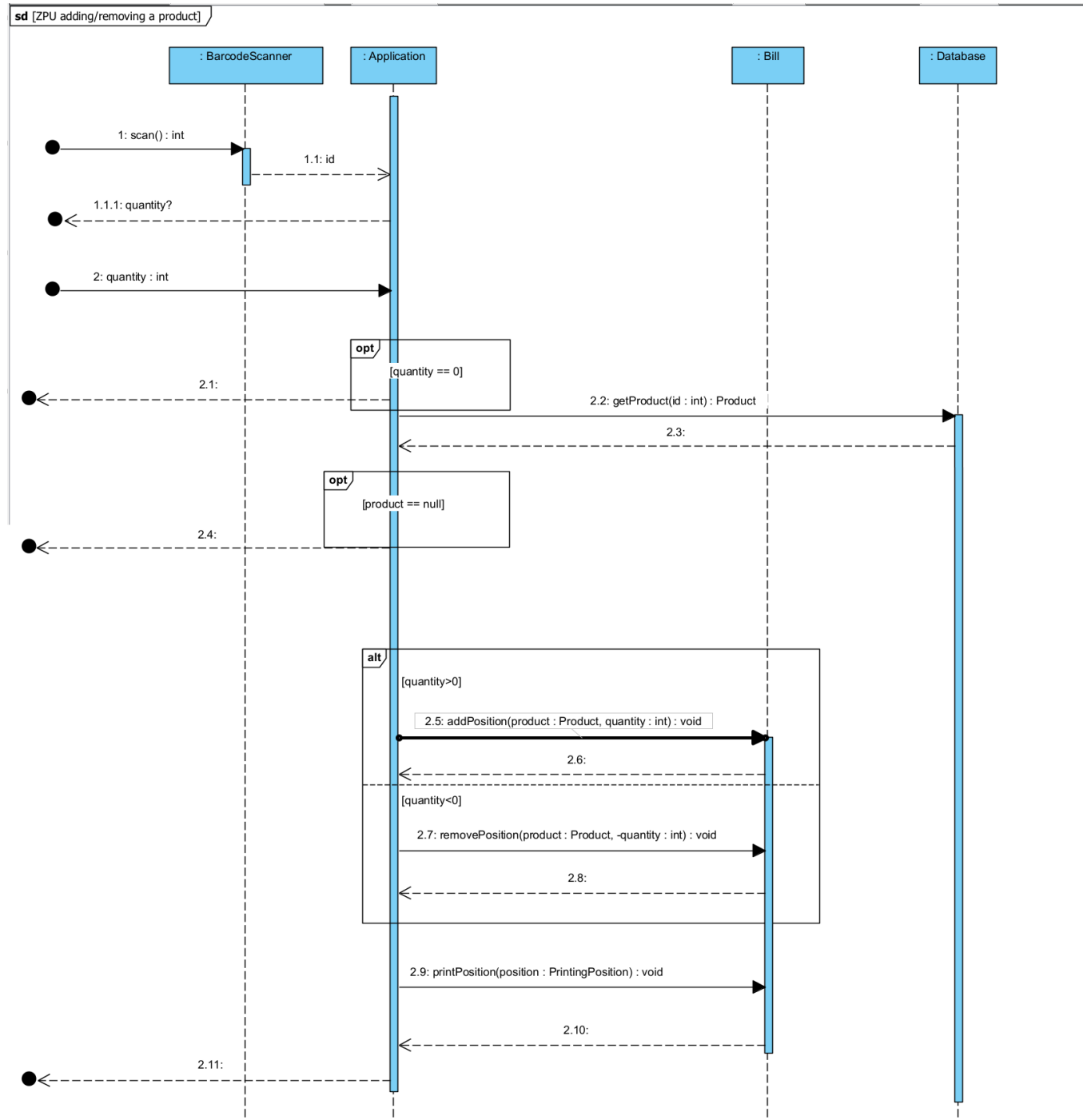
    public void calculatingFinalSums(){}

    private float sum(){return 0.0f}
    private ArrayList<Float> taxes() {return null;}
    private void printSum(float sum){}
    private void printTaxes(ArrayList<Float> taxesSums){}
    public void printBill(){}

}
```

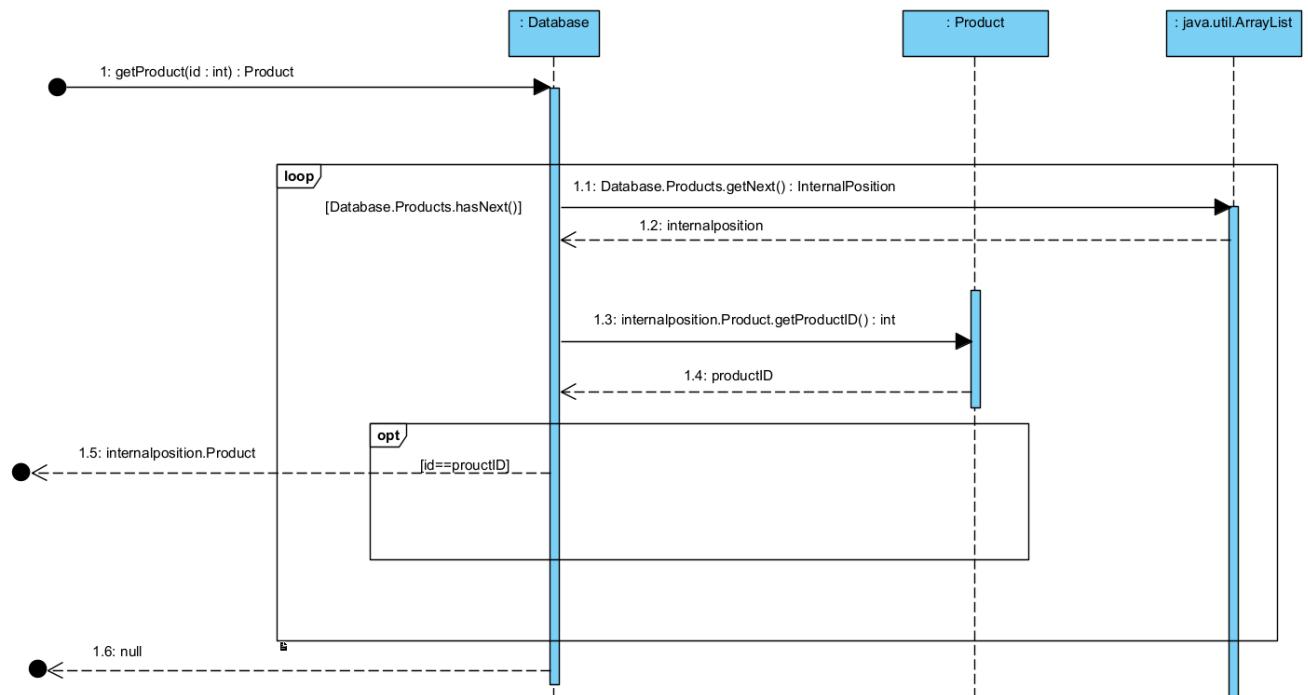
Diagramy sekwencji

Diagram PU adding/removing a product



Subdiagram getProduct()

sd [getProduct]

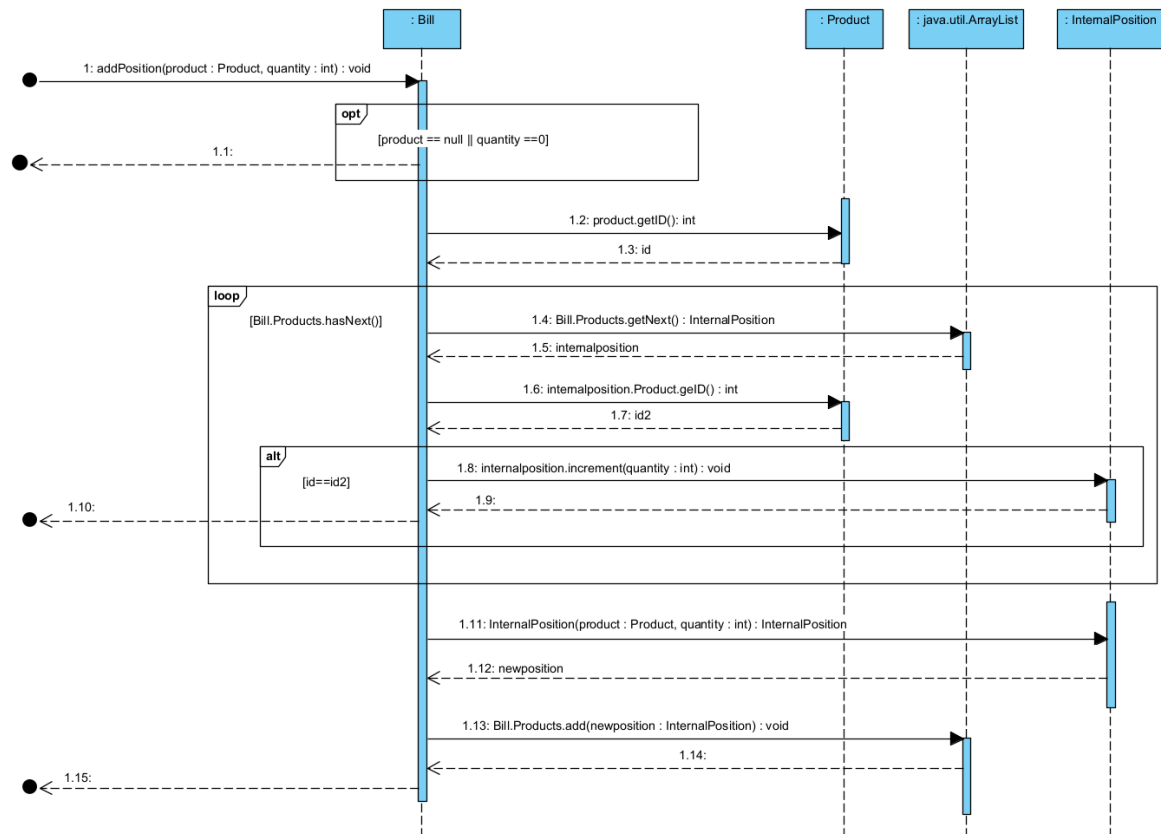


```

public static Product getProduct(int id) {
    Product product;
    for (InternalPosition x:Products) {
        if(x.Product.getProductID()==id) {
            product=x.Product;
            return product;
        }
    }
    return null;
}
  
```


Subdiagram addPosition()

sd [addPosition]



```

public void addPosition(Product product, int quantity) {
    for (var product : products) {
        if (product.Product.getProductID() == product.getProductID()) {
            product.increment(quantity);
            return;
        }
    }
    products.add(new InternalPosition(product, quantity));
}

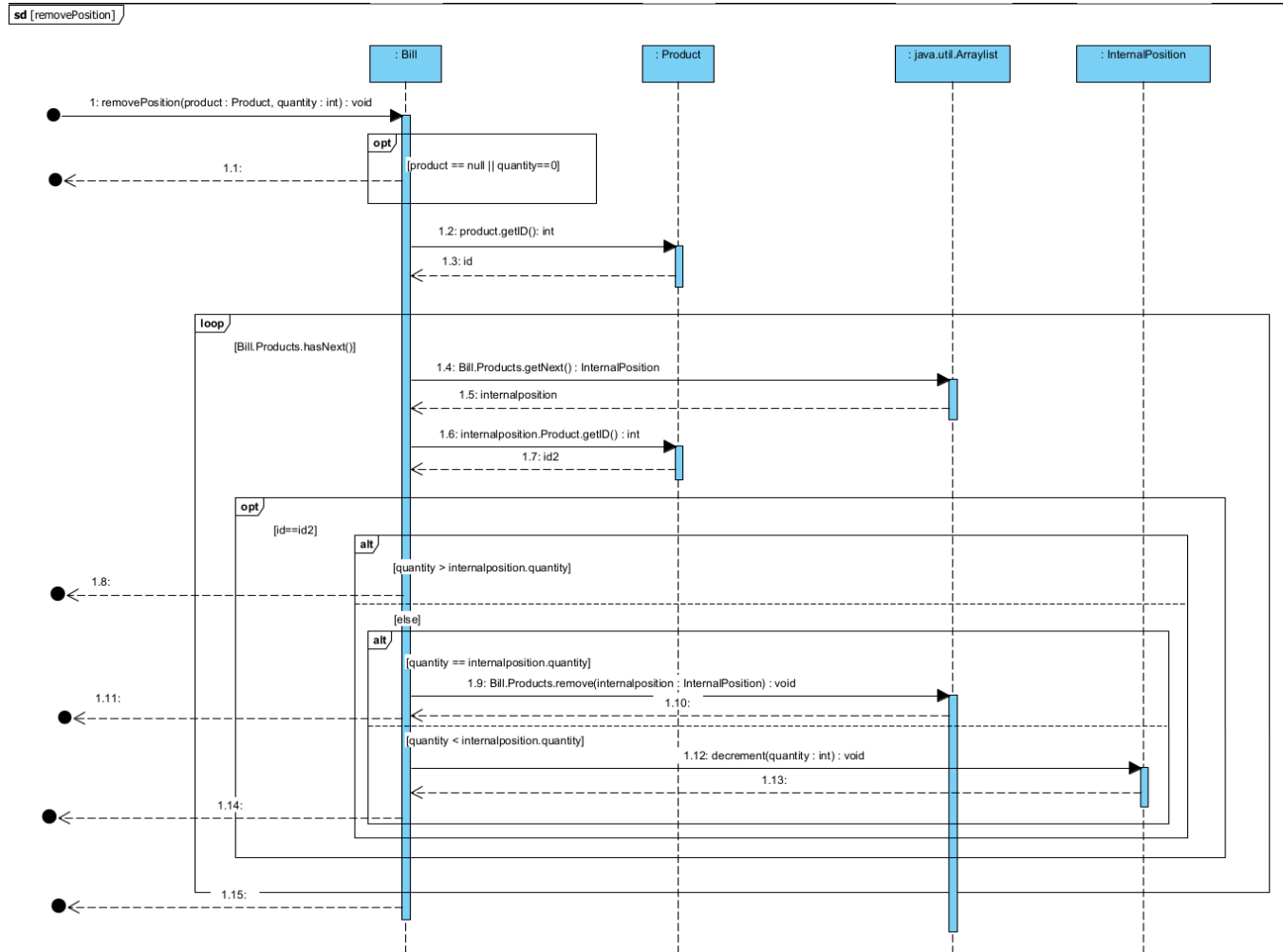
```

```

public void increment(int quantity) {
    this.Quantity += quantity;
}

```

Subdiagram removePosition()



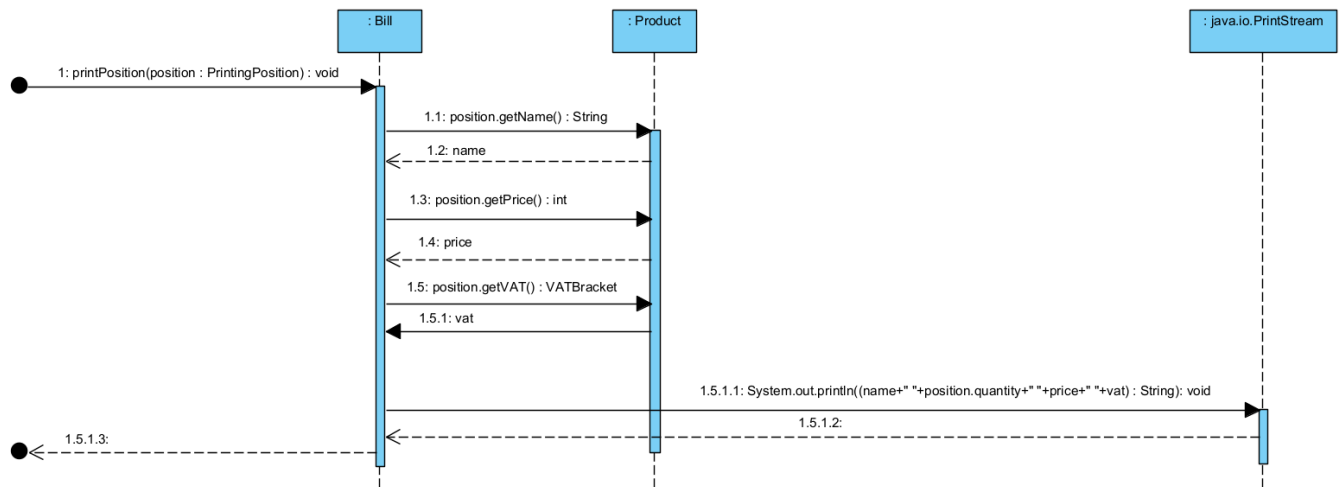
```

public void removePosition(Product product, int quantity) {
    for (var produt : products) {
        if (produt.Product.getProductID() == product.getProductID()) {
            if (quantity > produt.Quantity) return;
            else {
                if (produt.Quantity > quantity)
                    produt.decrement(quantity);
                else {
                    products.remove(produt);
                }
            }
        }
    }
    return;
}
}

```

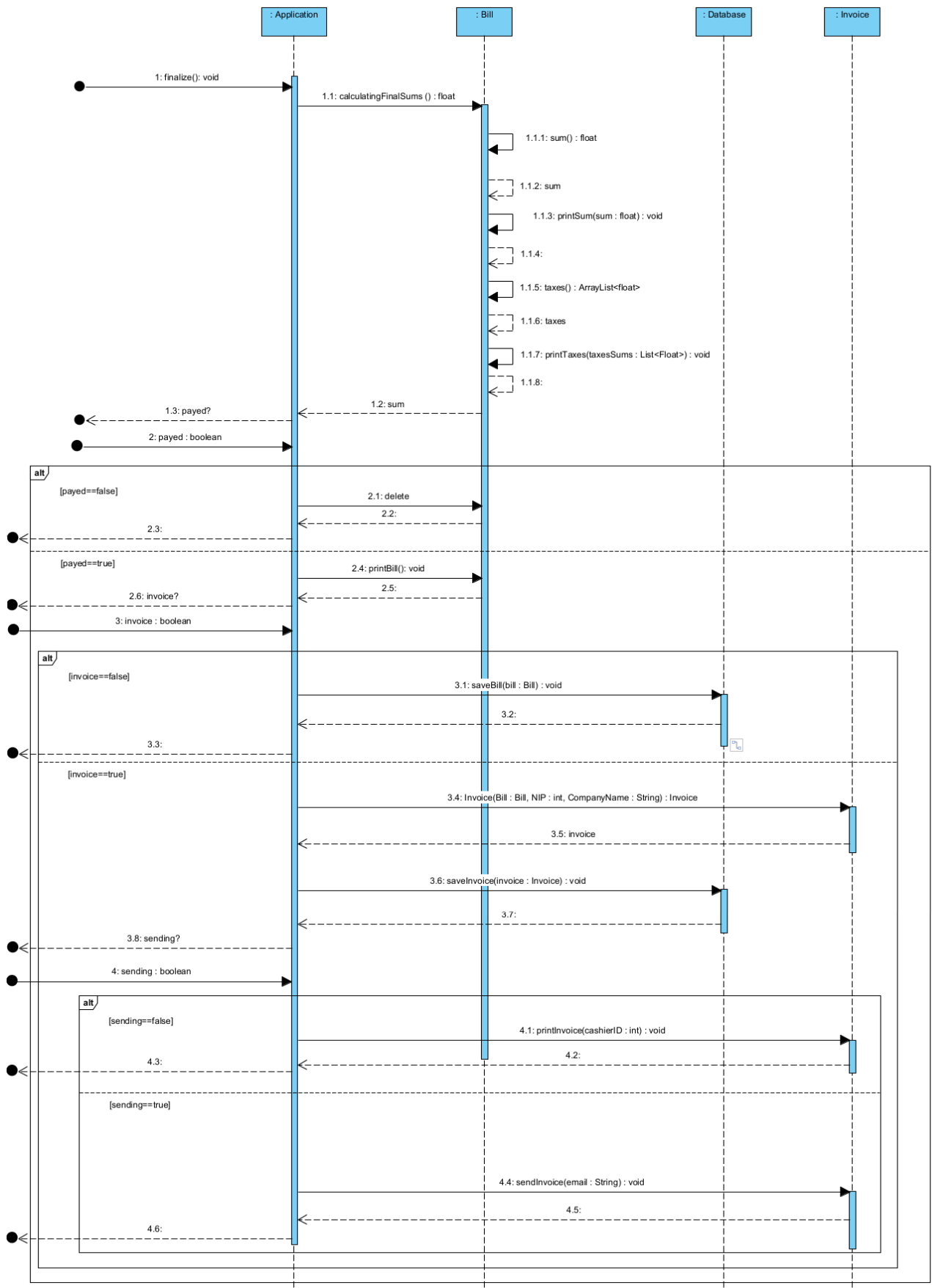
Subdiagram printPosition()

sd [printPosition]



```
public void printPosition(PrintingPosition product) {
    System.out.println(product.Product.getName() + " " + product.Quantity + " "
        + product.Product.getPrice() + " " + product.Product.getVAT());
}
```

Diagram PU Finalzaing the bill



```

public void calculatingFinalSums() {
    printSum(sum());
    printTaxes(taxes());
}

private float sum() {
    float sum = 0;
    for (var product : products) {
        sum += product.Product.getPrice() * product.Quantity;
    }
    return sum;
}

private void printSum(float sum) {
    System.out.println("Suma: "+sum);
}

private void printTaxes(ArrayList<Float> taxesSums) {

    for(int i=0;i<4;i++)
        System.out.println(VATBracket.getBracketForValue(i)+"
"+taxesSums.get(i));

}

public void printBill() {
    System.out.println("Dziekujemy za zakupy");
}

```

```

public void saveBill(Bill bill) {
    bills.add(bill);
}

public void saveInvoice(Invoice invoice) {
    invoices.add(invoice);
}

```

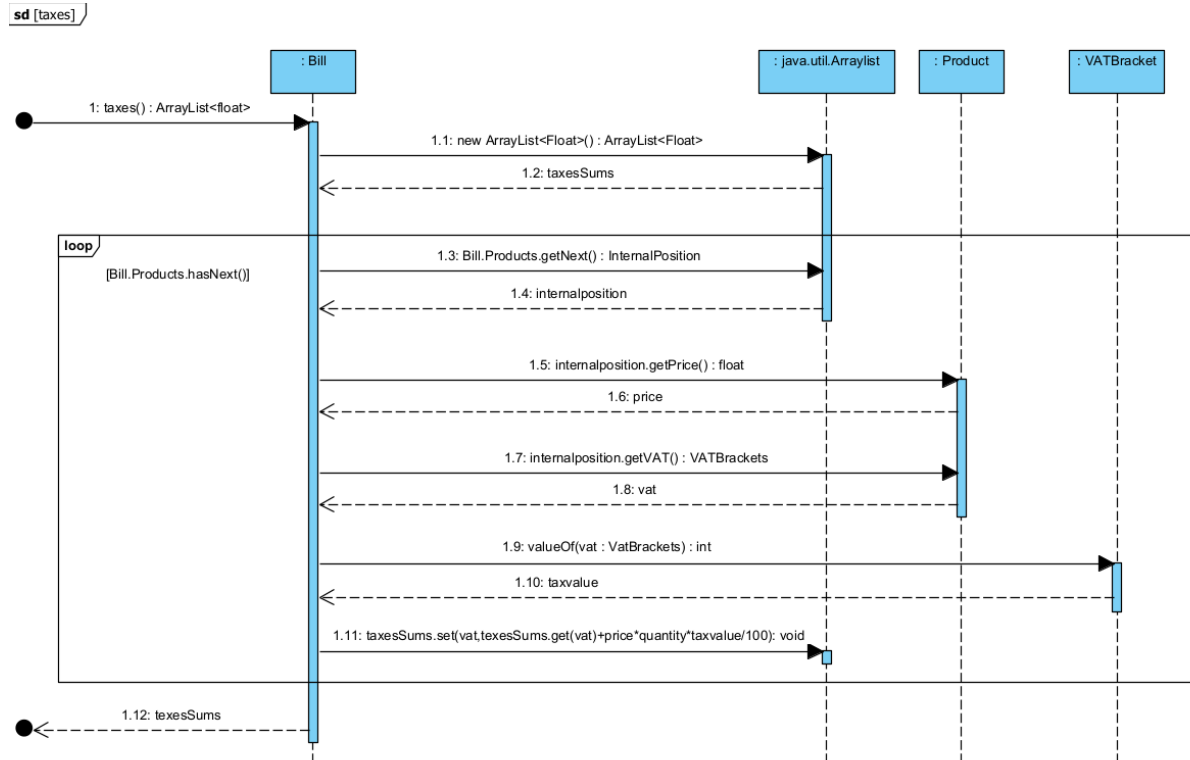
```

public void printInvoice(int cashierID) {
    System.out.print("Data : ");
    Bill.printHeader(cashierID);
    System.out.println("NAZWA FIRMY : " + CompanyName);
    System.out.println("NIP : " + NIP);
    Bill.show();
    Bill.calculatingFinalSums();
}

public void sendInvoice(String email) {
    System.out.println("Wysylanie faktury na adres email: " + email);
}

```

Subdiagram taxes()



```

private ArrayList<Float> taxes() {
    ArrayList<Float> taxesSums = new ArrayList<Float>();
    taxesSums.add(0.0f);
    taxesSums.add(0.0f);
    taxesSums.add(0.0f);
    taxesSums.add(0.0f);

    for (var product : products) {
        int index = switch (product.Product.getVAT()) {
            case A -> 0;
            case B -> 1;
            case C -> 2;
            case D -> 3;
        };

        taxesSums.set(index, taxesSums.get(index) +
product.Product.getPrice() * product.Quantity *
VATBracket.valueOf(product.Product.getVAT().name()).value / 100);
    }

    return taxesSums;
}
  
```

Uzyskany kod

BarcodeScanner

```
public interface BarcodeScanner {  
    public int scan();  
}
```

VATBracket

```
public enum VATBracket {  
    A(23),  
    B(8),  
    C(5),  
    D(0);  
    public final int value;  
    private VATBracket(int label) {this.value = label;}  
}
```

Invoice

```
import java.util.ArrayList;  
public class Invoice extends sklep.Bill {  
    Bill Bill;  
    int NIP;  
    String CompanyName;  
  
    public Invoice(Bill Bill,int NIP,String CompanyName){  
        this.Bill=Bill;  
        this.NIP = NIP;  
        this.CompanyName = CompanyName;  
    }  
    public void printInvoice(int cashierID){  
        Bill.printHeader(cashierID);  
        System.out.println("NAZWA FIRMY : " + CompanyName);  
        System.out.println("NIP : " + NIP);  
        Bill.show();  
        Bill.calculatingFinalSums();  
    }  
  
    public void sendInvoice(String email){  
        System.out.println("Wysylanie faktury na adres email: " + email);  
    }  
}
```

PrintingPosition

```
public class PrintingPosition {  
  
    protected Product Product;  
    protected int Quantity;  
  
    public PrintingPosition(Product product, int quantity) {  
  
        Product=product;  
        Quantity=quantity;  
    }  
}
```

Database

```
import java.util.ArrayList;
public class Database {
    private static ArrayList<InternalPosition> Products;
    static{
        Products=new ArrayList<InternalPosition>();
        Products.add(new InternalPosition(new Product("Chleb
pszenny",3.49f, VATBracket.B,1),36));
        Products.add(new InternalPosition(new Product("Mleko muuu",3.99f,
VATBracket.B,2),314));
        Products.add(new InternalPosition(new Product("Telewizor
32'",1299.99f, VATBracket.A,3),4));
        Products.add(new InternalPosition(new Product("Radioodbiornik
Rydzunio",333.33f, VATBracket.A,4),12));
    }
    private ArrayList<Bill> bills = new ArrayList<Bill>();
    private ArrayList<Invoice> invoices= new ArrayList<Invoice>();
    public static Product getProduct(int id) {
        Product product;
        for (InternalPosition x:Products) {
            if(x.Product.getProductID()==id) {
                product=x.Product;
                return product;
            }
        }
        return null;
    }
    public static int getQuantity(int id){

        int quantity = -1;
        for (InternalPosition x:Products) {
            if(x.Product.getProductID()==id) {
                quantity=x.Quantity;
            }
        }
        return quantity;
    }

    public void saveBill(Bill bill){
        bills.add(bill);
    }
    public void saveInvoice(Invoice invoice){
        invoices.add(invoice);
    }

    public boolean login(String login, String password){
        if(login.compareTo(Login) == 0 && password.compareTo(Passowrd)==0)
            return true;
        return false;
    }

}
```

Bill

```
import java.text.SimpleDateFormat;
import java.util.ArrayList;
import java.util.Date;
public class Bill {

    private ArrayList<InternalPosition> products;
```



```

private int billId;
private Date Date;

Bill(){
    products=new ArrayList<InternalPosition>();
    billId = (int) new Date().getTime();
    Date = new Date();
}

public void printHeader(int cashierID){
    SimpleDateFormat f = new SimpleDateFormat("yyyy-MM-dd hh:mm");
    System.out.println("Sklep Fajny");
    System.out.println("NIP 328957834275");
    System.out.println("Kasjer : "+cashierID);
    System.out.println(f.format(Date));
}

public void addPosition(Product product, int quantity) {

    for (var produt : products) {

        if(produt.Product.getProductID()==product.getProductID() &&
produt.Quantity<quantity){
            produt.increment(quantity);
            return;
        }
    }
    products.add(new InternalPosition(product,quantity));
}

public void printPosition(PrintingPosition product) {
    System.out.println(product.Product.getName()+" "+product.Quantity+"
"+product.Product.getPrice()+" "+product.Product.getVAT());
}

public void show() {
    for (InternalPosition product:products) {
        System.out.println(product.Product.getName()+"
"+product.Quantity+" "+product.Product.getPrice()+"
"+product.Product.getVAT());
    }
}

public void removePosition(Product product, int quantity) {
    for (var produt : products) {
        if (produt.Product.getProductID() == product.getProductID()) {
            if(quantity> produt.Quantity) return;
            else {
                if (produt.Quantity > quantity)
                    produt.decrement(quantity);
                else {
                    products.remove(produt);
                }
            }
        }
        return;
    }
}

public void calculatingFinalSums() {
    printSum(sum());;
}

```

```

        printTaxes(taxes());
    }

    private float sum(){
        float sum = 0;
        for (var product : products){
            sum += product.Product.getPrice() * product.Quantity;
        }
        return sum;
    }

    private ArrayList<Float> taxes() {
        ArrayList<Float> taxesSums = new ArrayList<Float>();
        taxesSums.add(0.0f);
        taxesSums.add(0.0f);
        taxesSums.add(0.0f);
        taxesSums.add(0.0f);

        for (var product : products) {
            int index = switch (product.Product.getVAT()) {
                case A -> 0;
                case B -> 1;
                case C -> 2;
                case D -> 3;
            };

            taxesSums.set(index, taxesSums.get(index) +
product.Product.getPrice() * product.Quantity *
VATBracket.valueOf(product.Product.getVAT().name()).value / 100);
        }

        return taxesSums;
    }

    private void printSum(float sum){
        System.out.println("Suma: "+sum);
    }

    private void printTaxes(ArrayList<Float> taxesSums){
        char v = 'A';
        for(int i=0;i<4;i++){
            System.out.println(v+" "+taxesSums.get(i));
            v++;
        }
    }

    public void printBill(){
        System.out.println("Dziekujemy za zakupy");
    }
}

```

InternalPosition

```
public class InternalPosition extends PrintingPosition {

    public InternalPosition(Product product, int quantity) {
        super(product, quantity);
    }

    public void increment(int quantity) {
        this.Quantity+=quantity;
    }
    public void decrement(int quantity) {
        this.Quantity-=quantity;
    }
}
```

Application

```
public class Application {
    static Bill bill;
    static int cashierID;
    Application(){
        bill = new Bill();
        cashierID=32;
    }

    public static void main(String[] args){
        Application app = new Application();
        bill.addPosition(Database.getProduct(2),2);
        bill.addPosition(Database.getProduct(2),2);
        bill.show();
        bill.calculatingFinalSums();
        System.out.println("\n\n\n");
        bill.addPosition(Database.getProduct(1),2);
        bill.removePosition(Database.getProduct(2),2);
        bill.show();
        bill.calculatingFinalSums();
        System.out.println("\n\n\n");
        Invoice x = new Invoice(bill,277277277,"Firma kox");
        x.printInvoice(cashierID);
    }
}
```

Product

```
public class Product {
    private String Name;
    private float Price;
    private VATBracket VAT;
    private int ProductID;

    Product(String Name, float Price, VATBracket VAT, int ProductID) {
        this.Name = Name;
        this.Price = Price;
        this.VAT = VAT;
        this.ProductID = ProductID;
    }
}
```

```

    public String getName() {
        return this.Name;
    }

    public float getPrice() {
        return this.Price;
    }

    public VATBracket getVAT() {
        return this.VAT;
    }

    public int getProductID() {
        return this.ProductID;
    }
}

```

Wyniki testów

```

bill.addPosition(Database.getProduct(2),2);
bill.addPosition(Database.getProduct(2),2);
bill.show();
bill.calculatingFinalSums();

```

```

Mleko muuu  4  3.99  B
Suma: 15.96
A  0.0
B  1.2768
C  0.0
D  0.0

```

```

bill.addPosition(Database.getProduct(1),2);
bill.removePosition(Database.getProduct(2),2);
bill.show();
bill.calculatingFinalSums();

```

```

Mleko muuu  2  3.99  B
Chleb pszenny  2  3.49  B
Suma: 14.96
A  0.0
B  1.1968
C  0.0
D  0.0

```

```
Invoice x = new Invoice(bill,277277277,"Firma kox");  
x.printInvoice(cashierID);
```

```
Sklep Fajny  
NIP 328957834275  
Kasjer : 32  
2023-12-08 05:43  
NAZWA FIRMY : Firma kox  
NIP : 277277277  
Mleko muuu 2 3.99 B  
Chleb pszenny 2 3.49 B  
Suma: 14.96  
A 0.0  
B 1.1968  
C 0.0  
D 0.0
```