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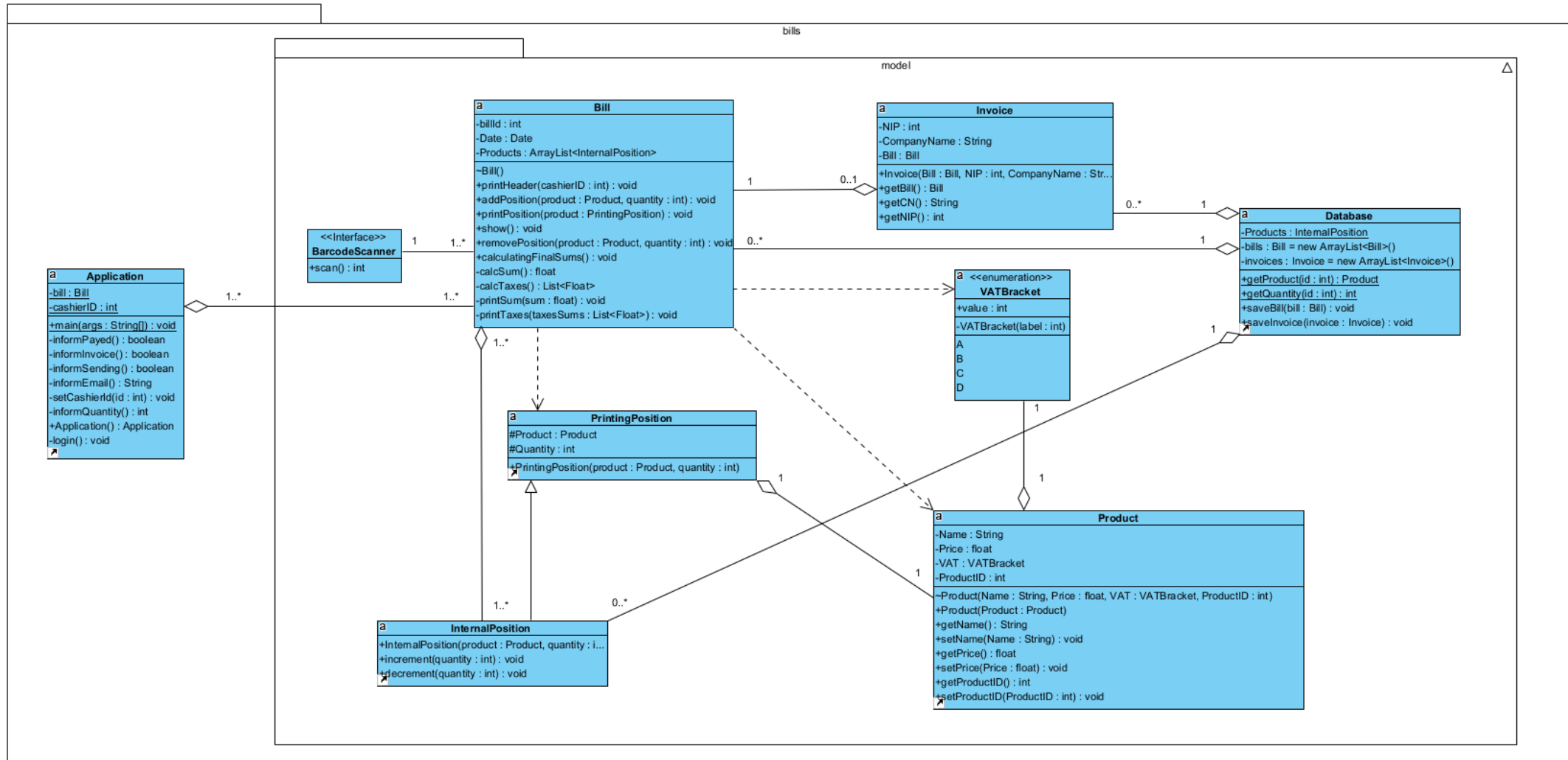
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## Inżynieria oprogramowania – etapy 5-7 Program wystawiający rachunki

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## Diagram klas



## Struktura klas

### Application

```
public class Application {
    static Bill;
    private static int cashierID;
    Application(){}
    private int informQuantity(){return 0;}
    private void setCashierId(int id){}
    private boolean informpayed(){return false;}
    private boolean informInvoice(){return false;}
    private boolean informSending(){return false;}
    private String informEmail(){return null;}
    private void login(){}
    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){
    }

    public Product(Product Product) {
```

```

    }

    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) {}
}

```

### InternalPosition

```

public class InternalPosition extends PrintingPosition {

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

    public void increment(int quantity) {}
    public void decrement(int 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{
    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) {}

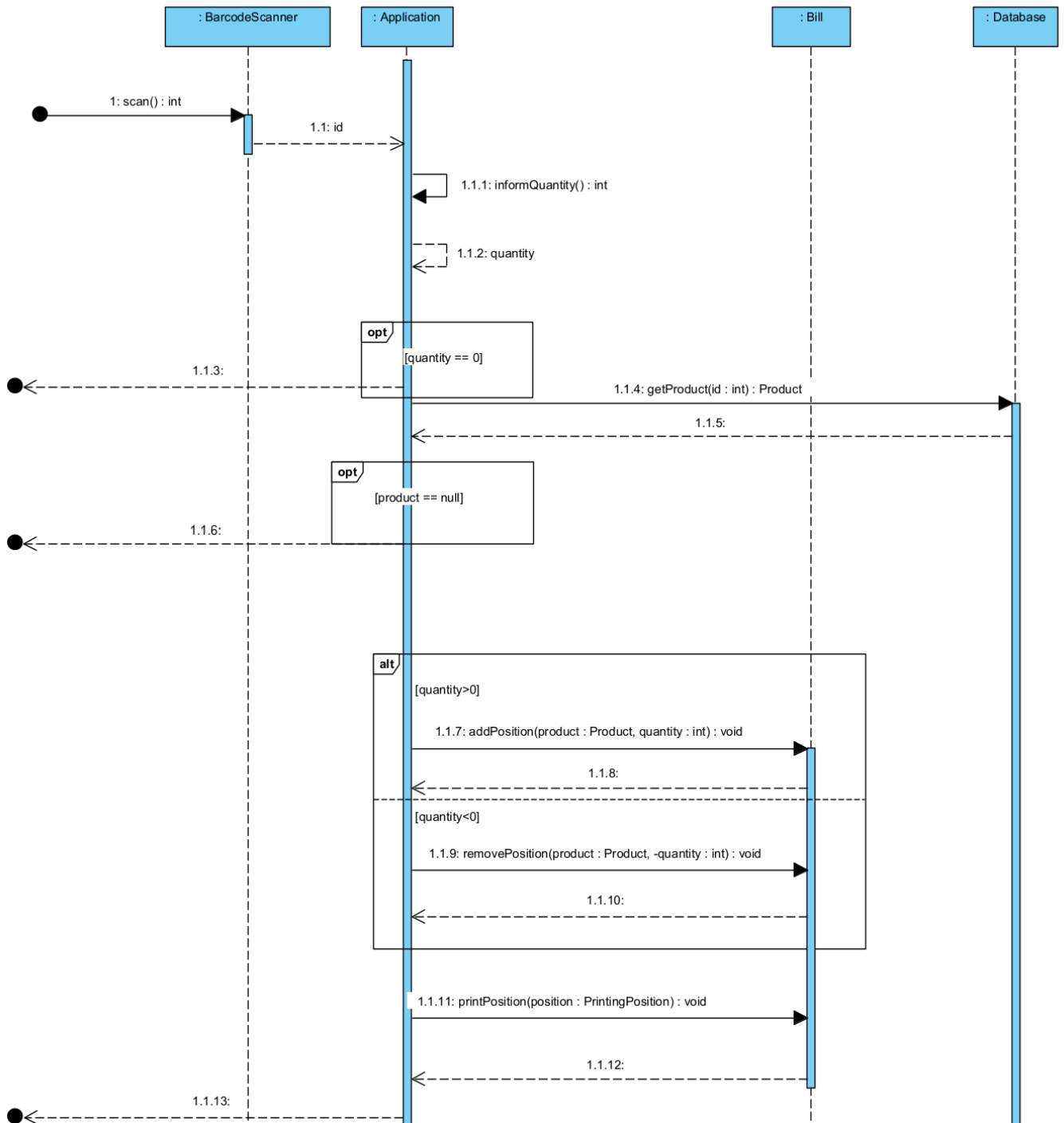
    public void calculatingFinalSums(){}

    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(){}
}
```

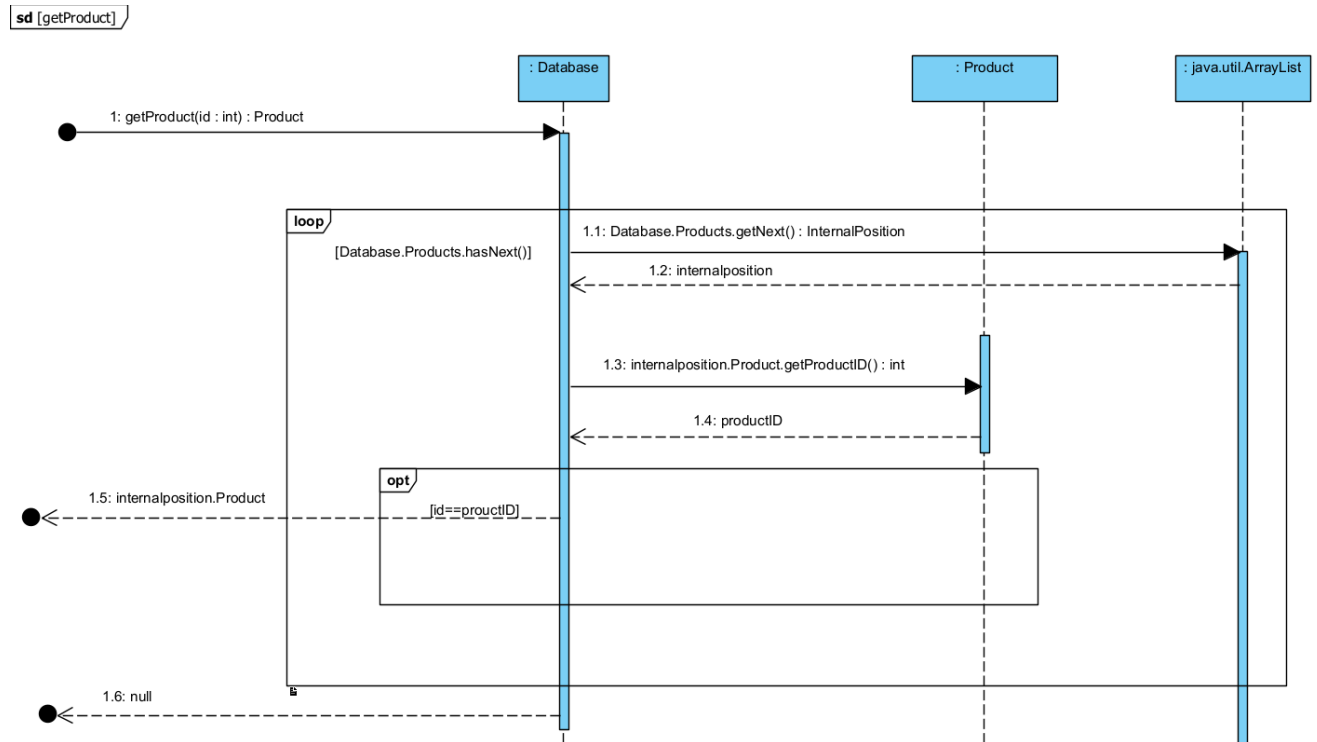
## Diagramy sekwencji

### Diagram PU adding/removing a product

sd [ZPU adding/removing a product]



## Subdiagram getProduct()

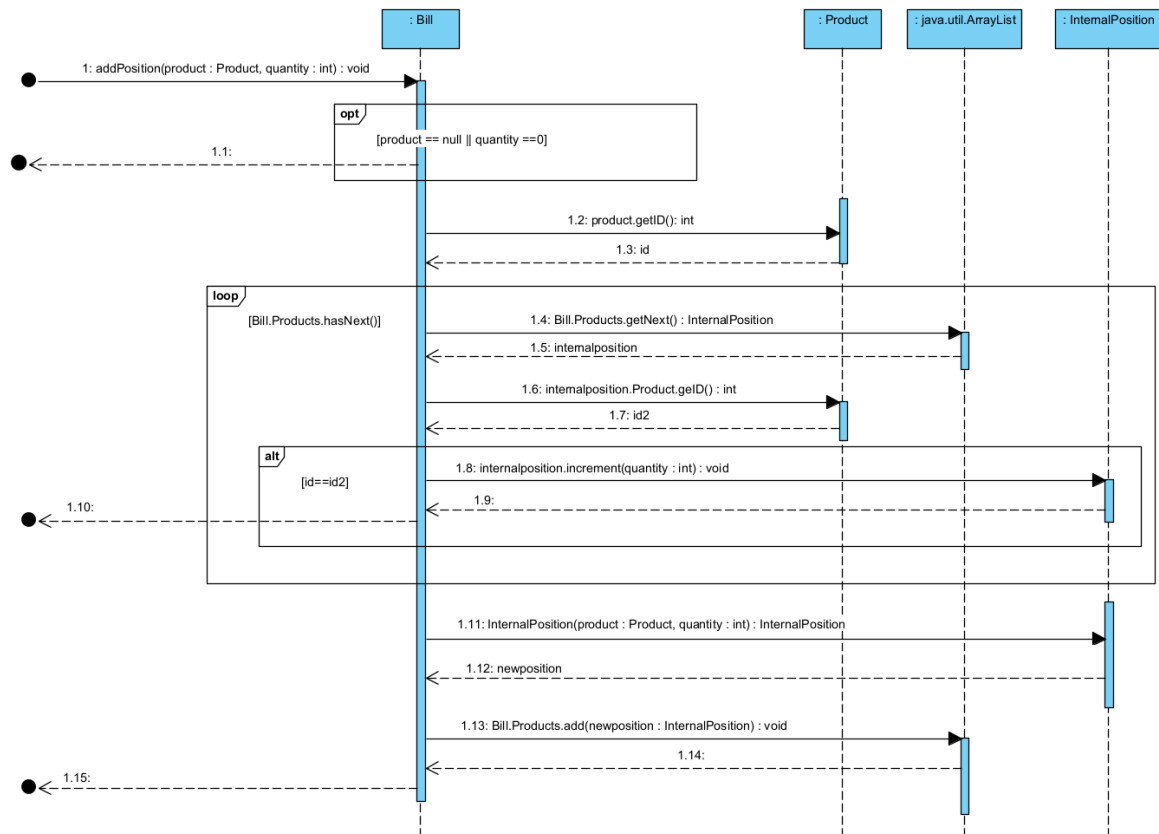


```

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));
}

```

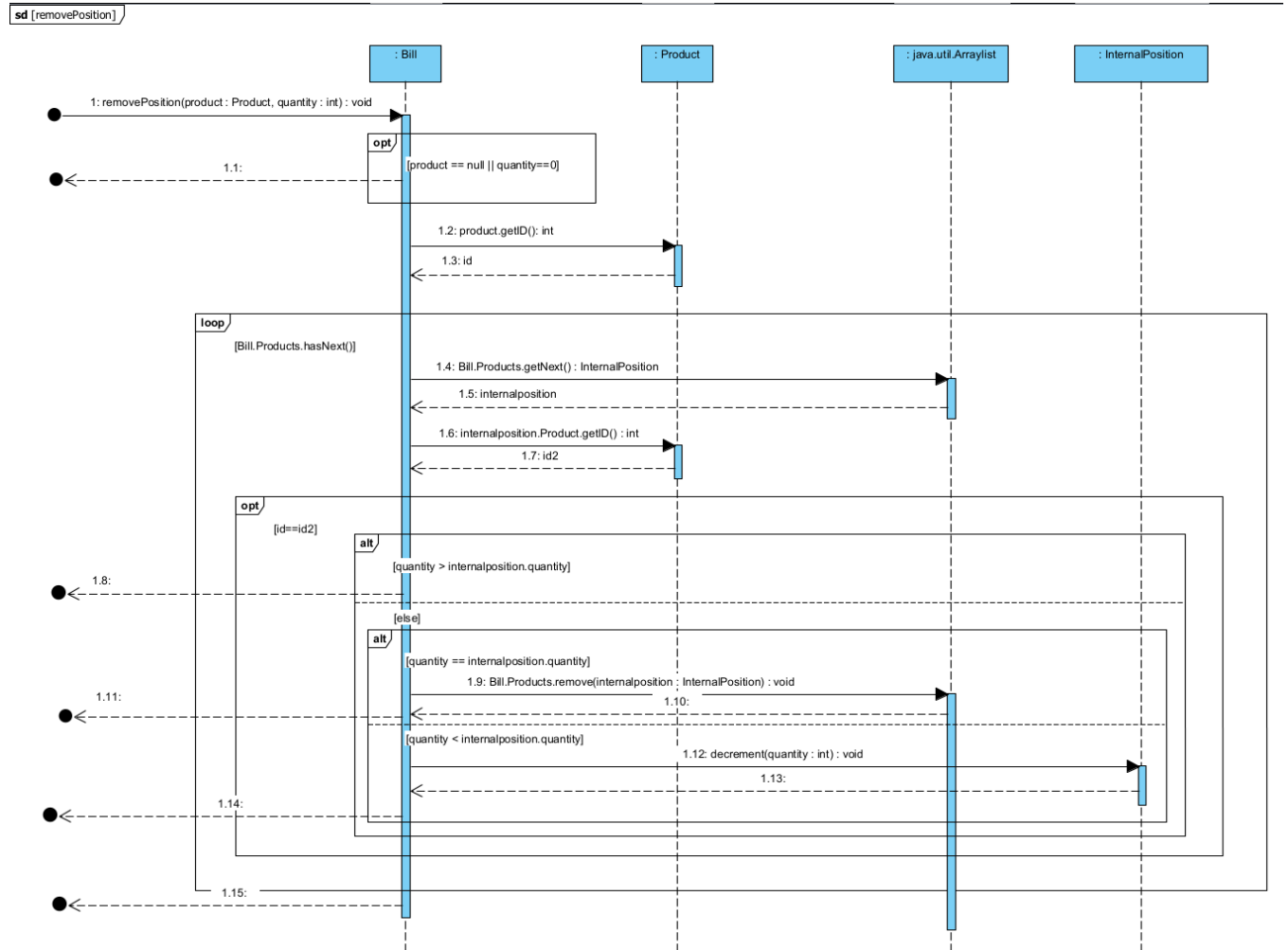
```

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

```



## Subdiagram removePosition()



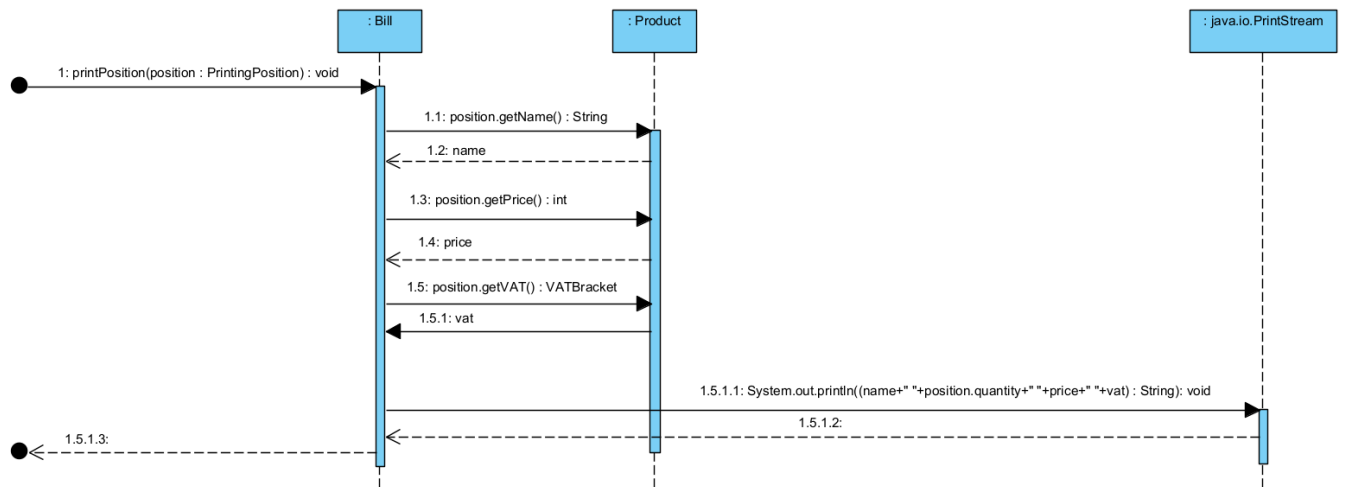
```

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()

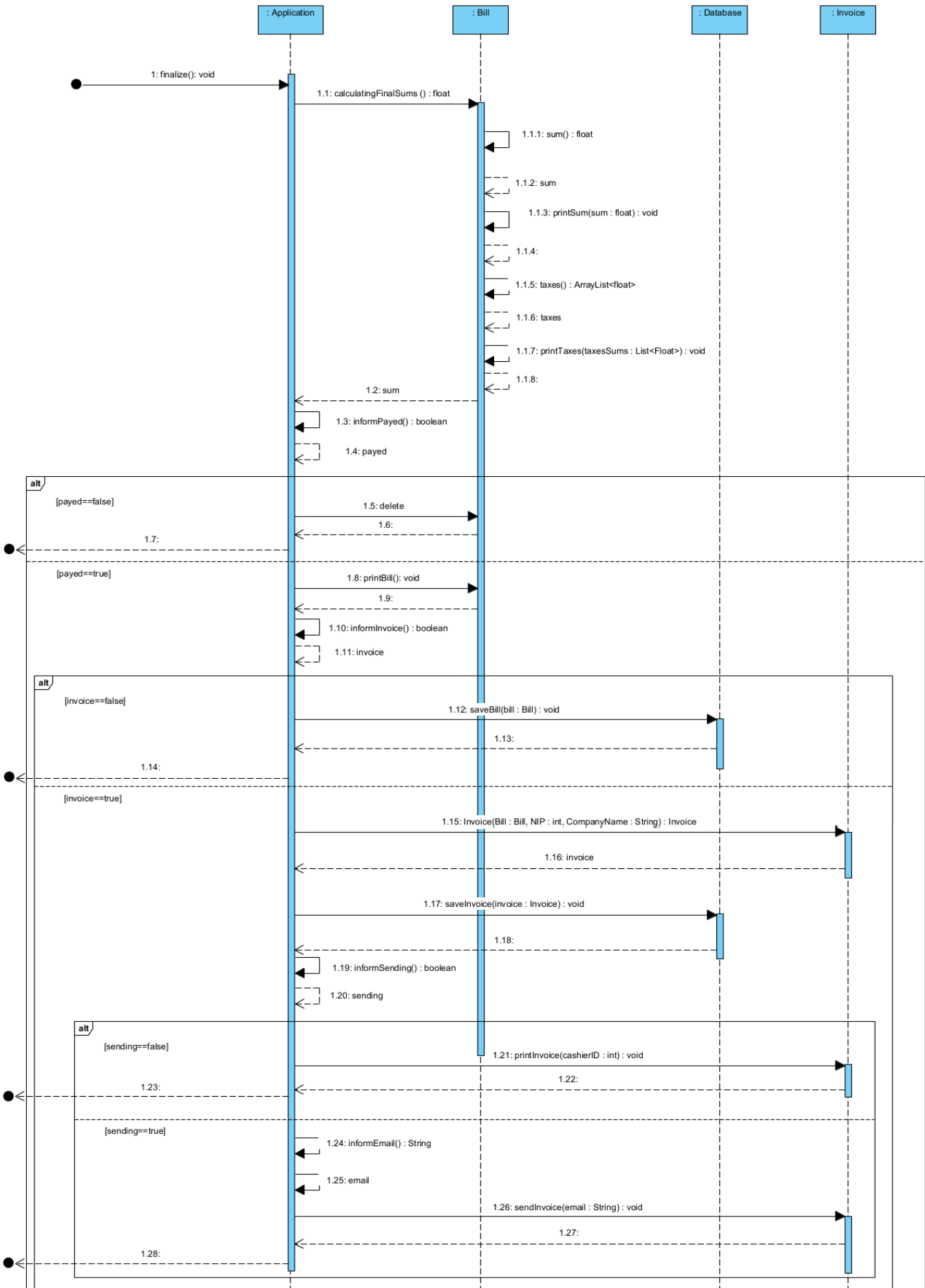
sd [printPosition]



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

# Diagram PU Finalzaing the bill

sd [ZPU Finalazing 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);
}

```

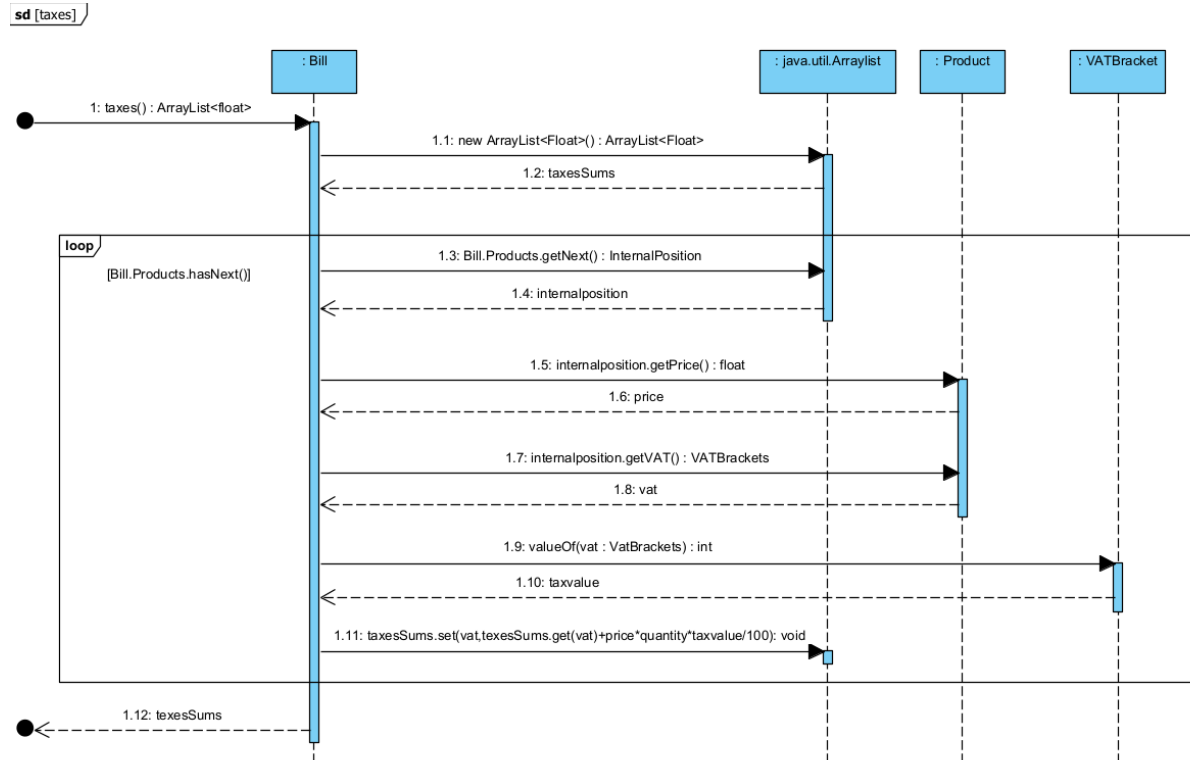
```

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 {
    private static Bill bill;
    private static int cashierID;
    Application(){ //ustawione dane do przetestowania
        bill = new Bill();
        setCashierId(32);
        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);
    }
    private void setCashierId(int id){
        cashierID = id;
    }
    private int informQuantity(){return 0;}
    private boolean informPayed(){return false;}
    private boolean informInvoice(){return false;}
    private boolean informSending(){return false;}
    private String informEmail(){return null;}
    private void login(){}
    public static void main(String[] args){
        new Application();
    }
}
```

## 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;
    }
}
```