FMFI UK

Online Food Ordering System

Semestrálny projekt z ASwS 2023

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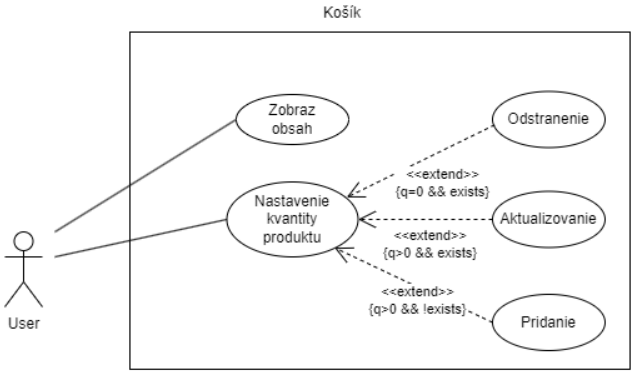
Patrik Hampel

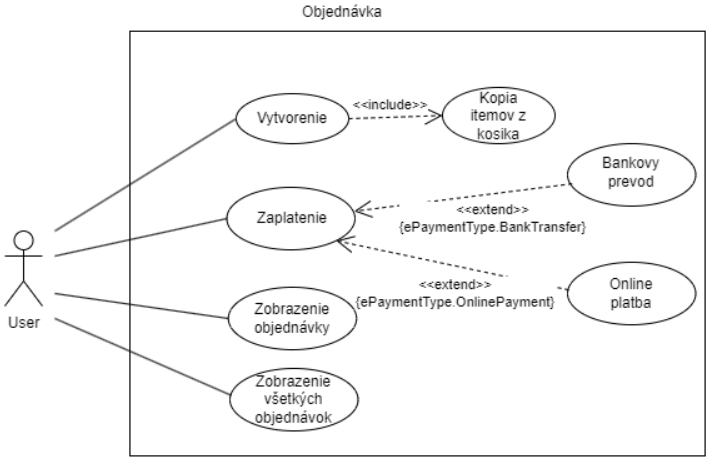
Úvod

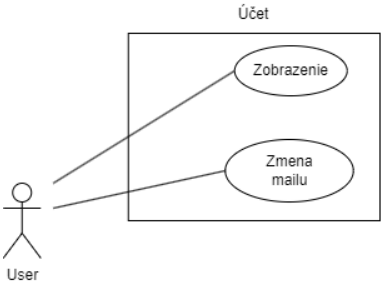
Systém slúži na objednávanie produktov (jedla). Zákazníci majú košíky, do ktorých môžu pridávať a odstraňovať produkty. Z košíka je možné vytvoriť objednávku, zaplatiť za ňu a sledovať jej status.

Exceptions ktoré sú thrownuté v kóde sa s pomocou middleware pošlú ako error message v jsone.

Use case







// Z pohľadu používateľa to záleží od implementácie a flowu frontendu. Pre používateľa sa v tomto prípade (resp. v každom prípade) iba vráti json ako odpoveď, teda scénar končí na prvom kroku.

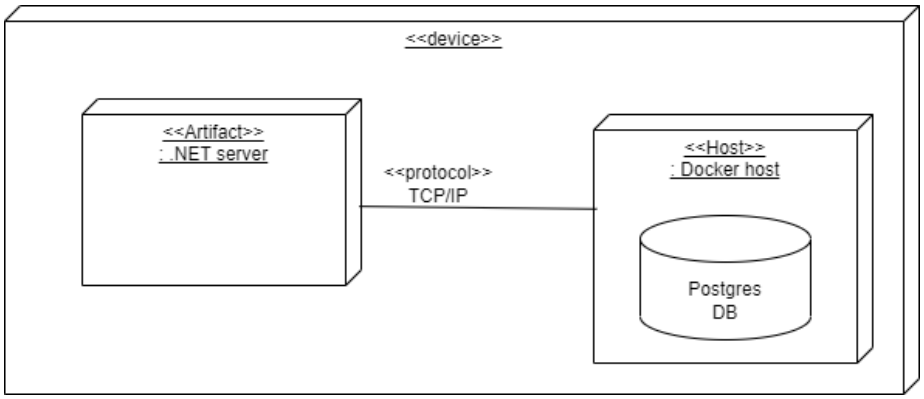
1. Use case: Nastavenie kvantity produktu
   Actor: User
   Precondition: prihlásený používateľ
   API má parametre ID produktu a kvantitu. Ak produkt neexistuje -> throw exception. Ak kvantita < 0 -> throw exception. Ak je produkt v košíku a kvantita je 0, pridá sa do košíka. Ak je produkt v košíku a kvantita nastavená na 0, odstráni sa z košíka. Ak produkt nie je v košíku, tak sa pridá.
2. Use case: Nastavenie kvantity produktu

Actor: User
Precondition: prihlásený používateľ, existujúci nezaplatený order
Podľa vybraného typu platby (parameter enum s 2ma možnosťami) sa vykoná platba.

3. Use case: Aktualizácia mailu
   Actor: User
   Precondition: prihlásený používateľ
   Parameter email. Skontroluje sa validita emailu a ak je validný, aktualizuje sa.

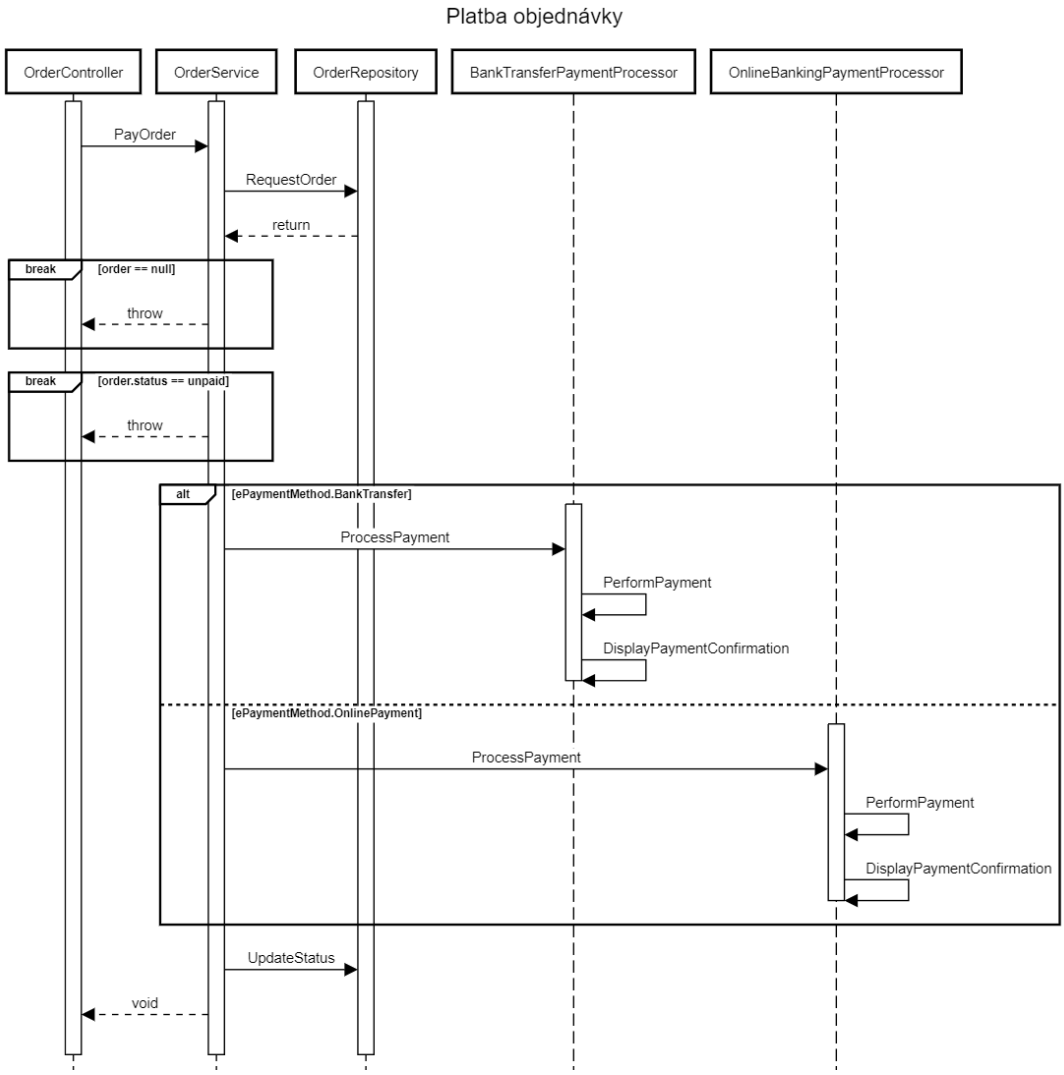
Architektúra systému

Na zariadení (v mojom prípade Windows, no .NET Core a Docker bežia na Linuxe aj MacOS) beží .NET Core backend server a Postgres DB je deploynutá cez Docker.

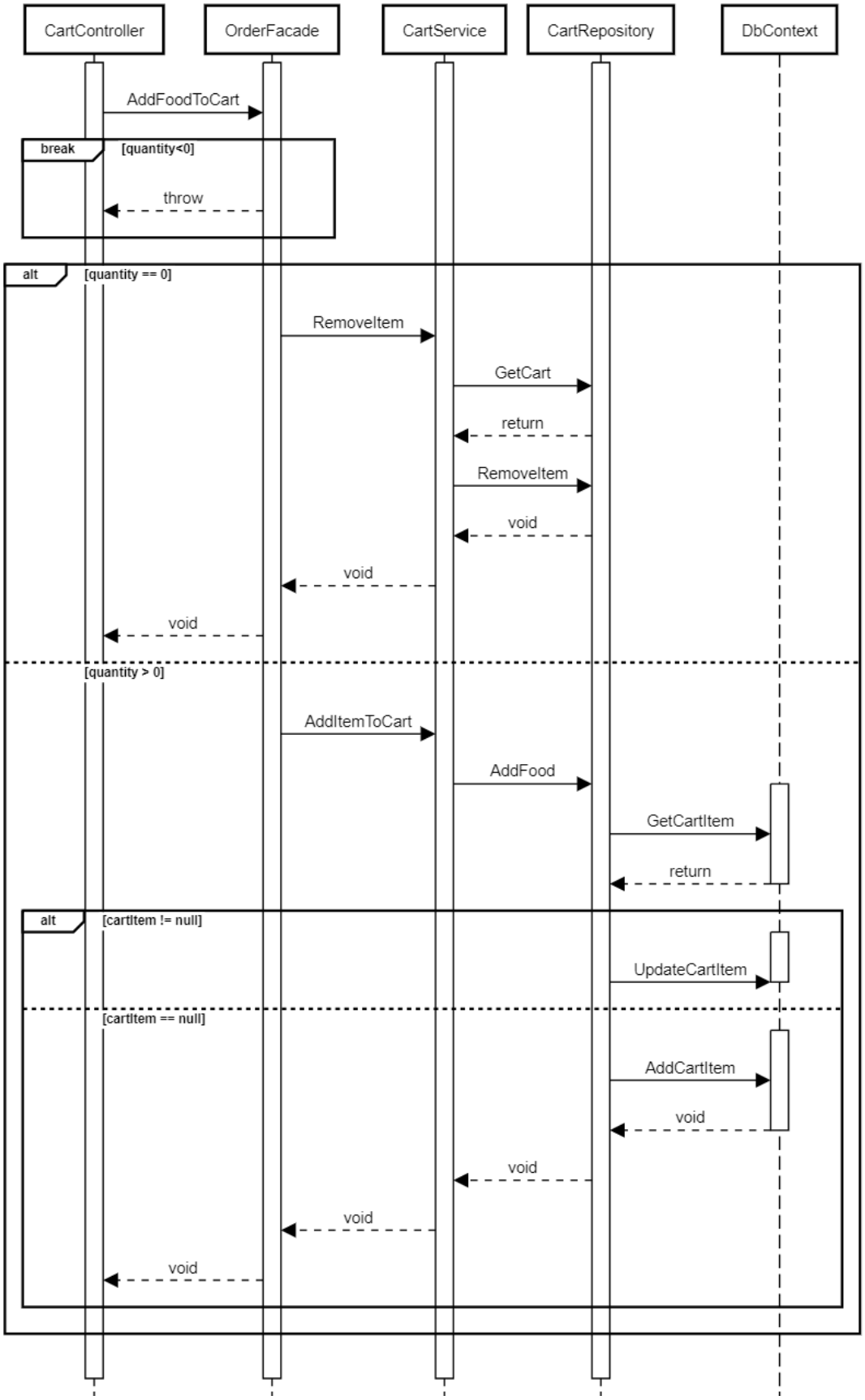


Analýza

Sequence diagram

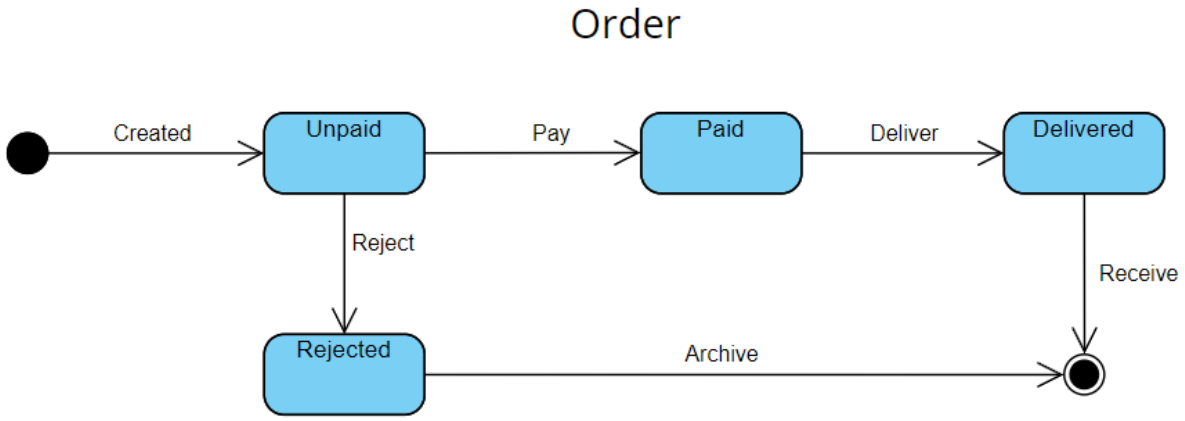


Aktualizácia košíka

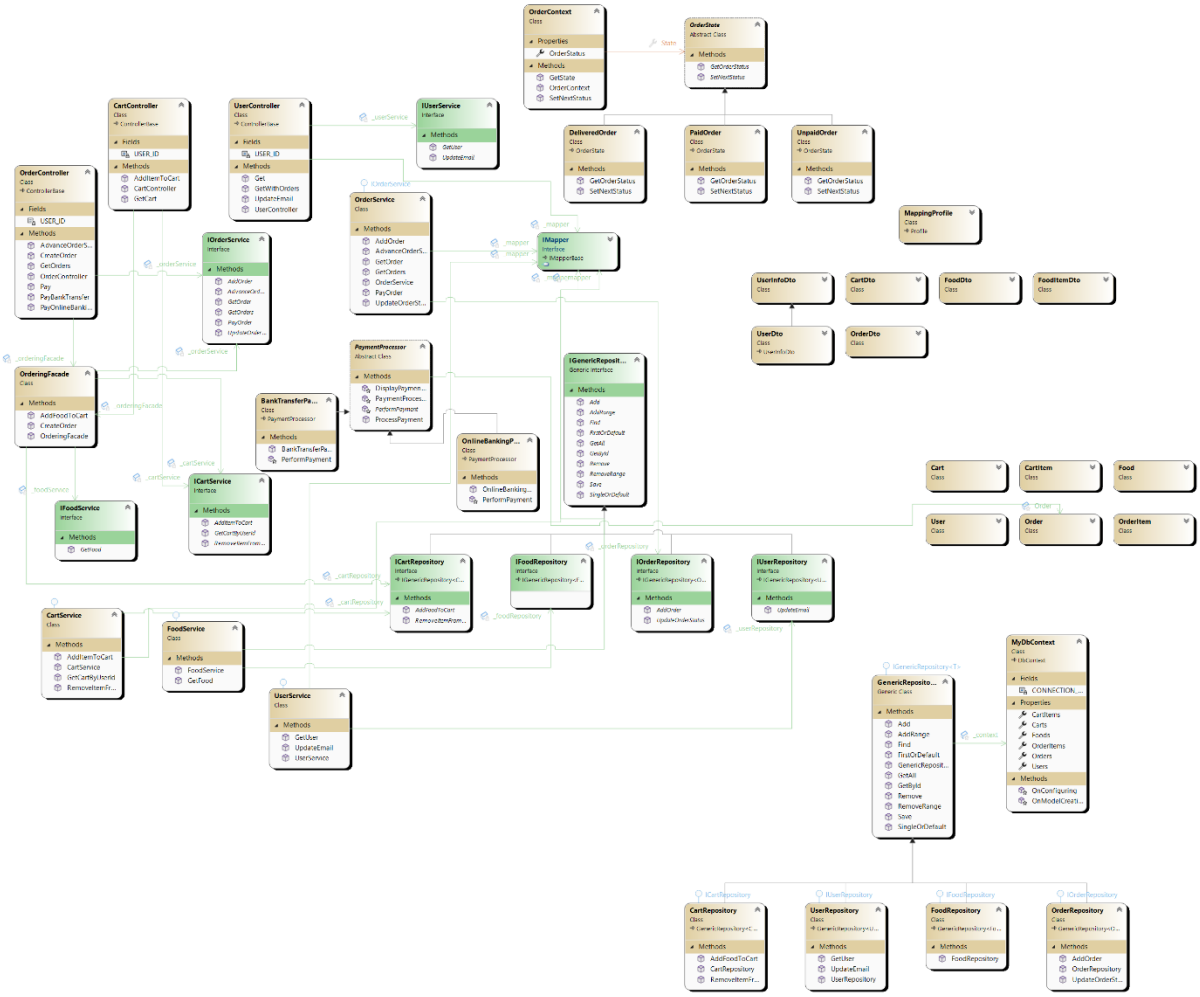


Activity diagram

State diagram

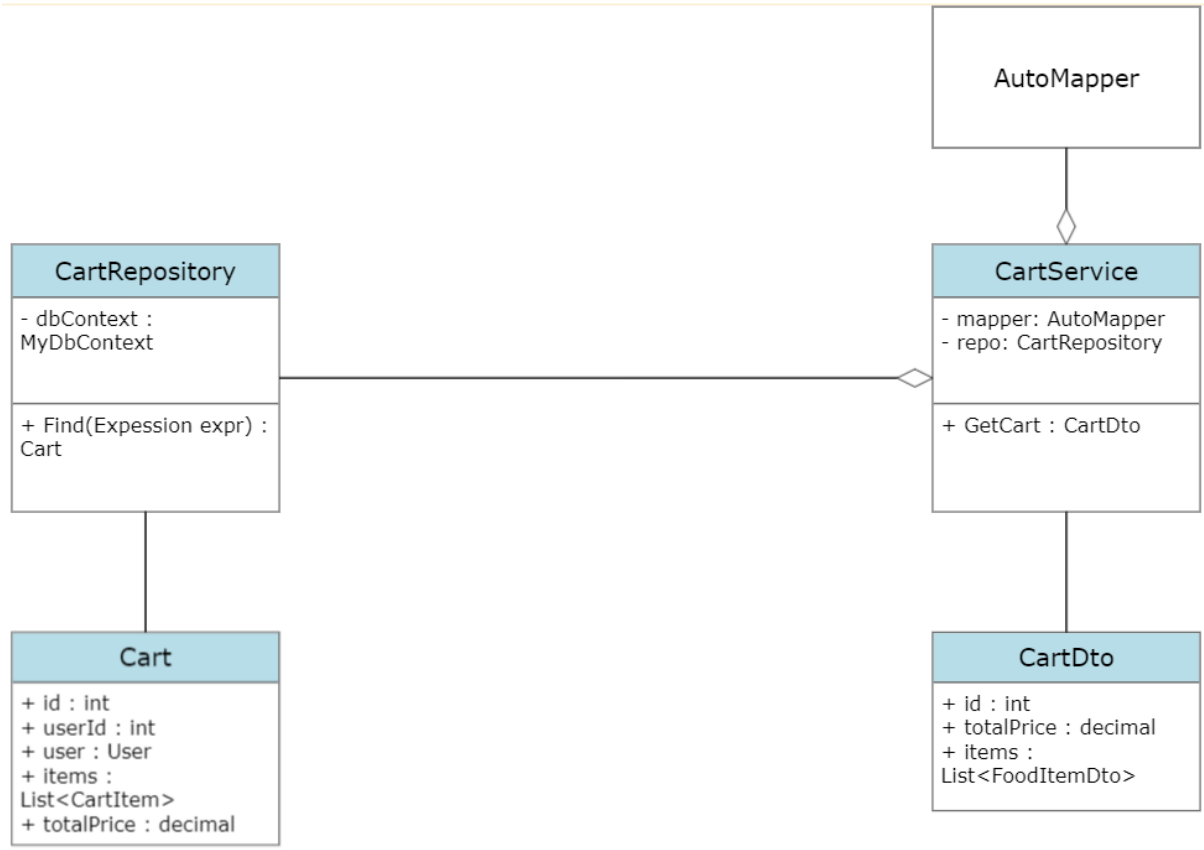


Návrh a implementácia, identifikácia vzorov



Class diagram

DTO



```
public class MappingProfile : Profile
{
    YelovSK
    public MappingProfile()
    {
        CreateMap<Order, OrderDto>();
        CreateMap<User, UserDto>();
        CreateMap<User, UserInfoDto>();
        CreateMap<UserDto, UserInfoDto>();
        CreateMap<Cart, CartDto>();
        CreateMap<CartItem, FoodItemDto>();
        CreateMap<OrderItem, FoodItemDto>();
        CreateMap<Food, FoodDto>();
    }
}
```

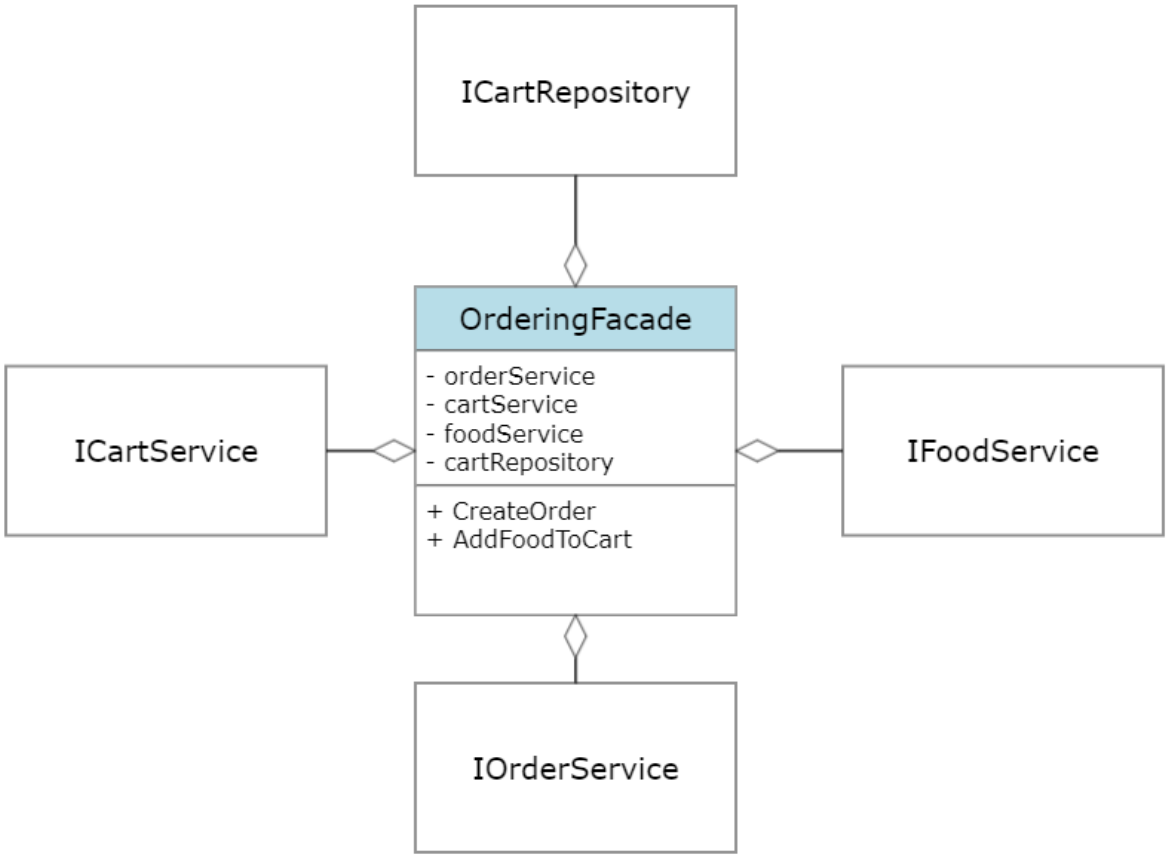
```
public class CartService : ICartService
{
    private readonly ICartRepository _cartRepository;
    private readonly IMapper _mapper;

    YelovSK
    public CartService(ICartRepository cartRepository, IMapper mapper)
    {
        _cartRepository = cartRepository;
        _mapper = mapper;
    }
```

```
public CartDto GetCartByUserId(int userId)
{
    var cart = _cartRepository.SingleOrDefault(expression: i:Cart => i.UserId == userId);

    if (cart == null)
    {
        throw new FoodOrderingException(message: "User not found");
    }

    return _mapper.Map<Cart, CartDto>(cart);
}
```

```
public class CartDto
{
    public int Id { get; set; }

    YelovSK
    public decimal TotalPrice => Items.Sum(f:FoodItemDto => f.Food.Price * f.Quantity);

    1 usage
    public List<FoodItemDto> Items { get; set; } = new();
}
```

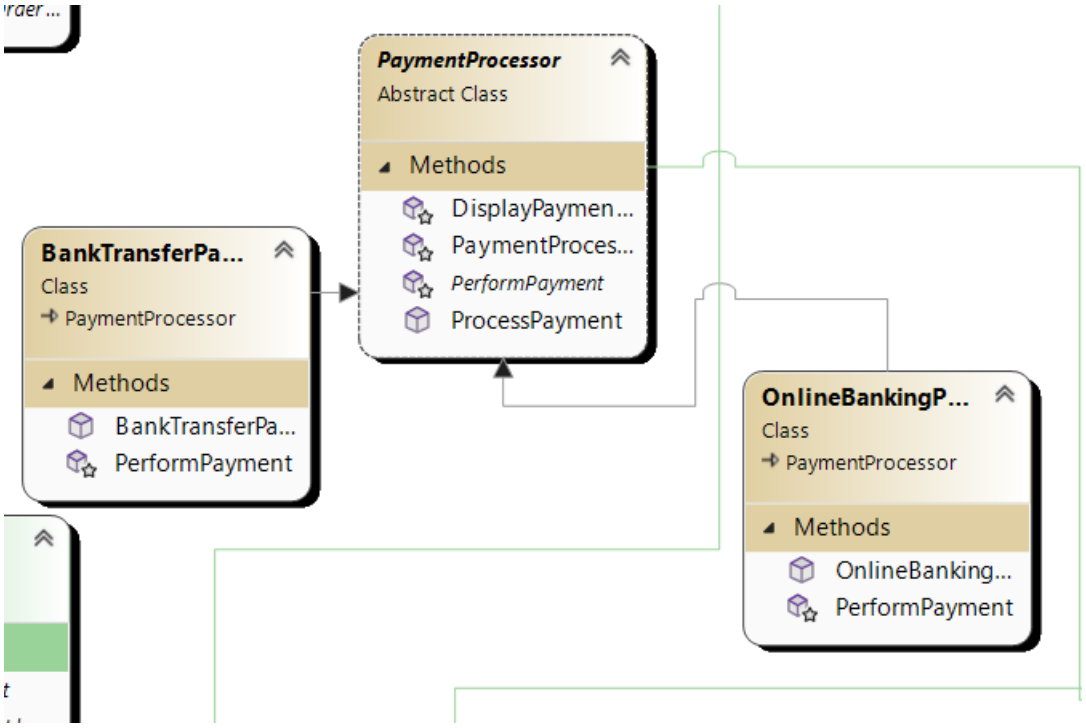
```
public class Cart
{
    2 usages
    public int Id { get; set; }

    [Required]
    [ForeignKey(nameof(User))]
    4 usages
    public int UserId { get; set; }

    2 usages
    public User User { get; set; }

    4 usages
    public ICollection<CartItem> Items { get; set; }

    YelovSK
    public decimal TotalPrice => Items.Sum(f:CartItem => f.Food.Price * f.Quantity);
}
```

Facade




```
public class OrderingFacade
{
    private readonly IOrderService _orderService;
    private readonly ICartService _cartService;
    private readonly IFoodService _foodService;
    private readonly ICartRepository _cartRepository;

    YelovSK
    public OrderingFacade(IOrderService orderService, ICartService cartService, IFoodService foodService, ICartRepository cartRepository)
    {
        _orderService = orderService;
        _cartService = cartService;
        _foodService = foodService;
        _cartRepository = cartRepository;
    }

    1 usage  YelovSK
    public OrderDto CreateOrder(int userId){...}

    1 usage  YelovSK
    public void AddFoodToCart(int userId, int foodId, int quantity){...}
}
```

Template method

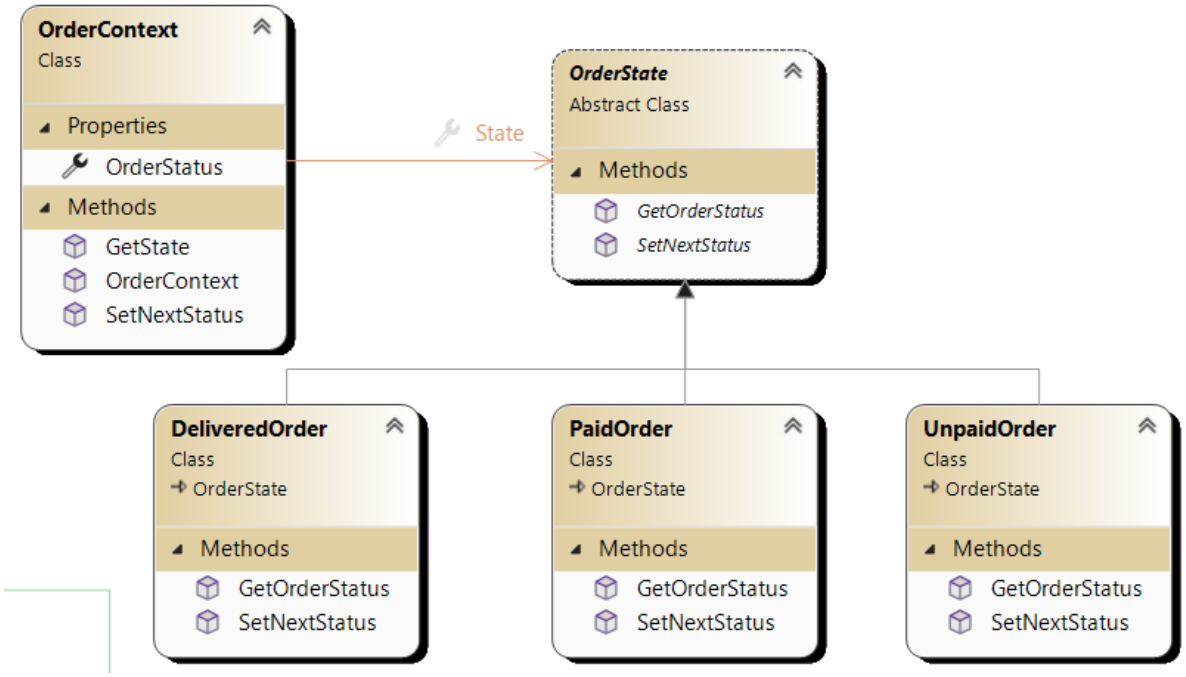


```
public abstract class PaymentProcessor
{
    protected readonly Order Order;

    2 usages  YelovSK
    protected PaymentProcessor(Order order)
    {
        Order = order;
    }

    1 usage  YelovSK
    public Order ProcessPayment()
    {
        PerformPayment();
        DisplayPaymentConfirmation();
        return Order;
    }

    1 usage  2 overrides  YelovSK
    protected abstract void PerformPayment();

    1 usage  YelovSK
    protected virtual void DisplayPaymentConfirmation()
    {
        Console.WriteLine("Payment processed successfully.");
    }
}
```

```
public class BankTransferPaymentProcessor : PaymentProcessor
{
    1 usage  YelovSK
    public BankTransferPaymentProcessor(Order order) : base(order)
    {
    }

    0+1 usages  YelovSK
    protected override void PerformPayment()
    {
        if (Order.Status ≠ eOrderStatus.Unpaid)
        {
            throw new FoodOrderingException( message: "Order is not in unpaid state");
        }

        Order.Status = eOrderStatus.Paid;
        Order.Message = "Performed bank transfer payment";
        Console.WriteLine("Performing bank transfer payment...");
    }
}
```

```
public class OnlineBankingPaymentProcessor : PaymentProcessor
{
    1 usage  YelovSK
    public OnlineBankingPaymentProcessor(Order order) : base(order)
    {
    }

    0+1 usages  YelovSK
    protected override void PerformPayment()
    {
        if (Order.Status ≠ eOrderStatus.Unpaid)
        {
            throw new FoodOrderingException( message: "Order is not in unpaid state");
        }

        Order.Status = eOrderStatus.Paid;
        Order.Message = "Performed online banking payment";
        Console.WriteLine("Performing online banking payment...");
    }
}
```

State



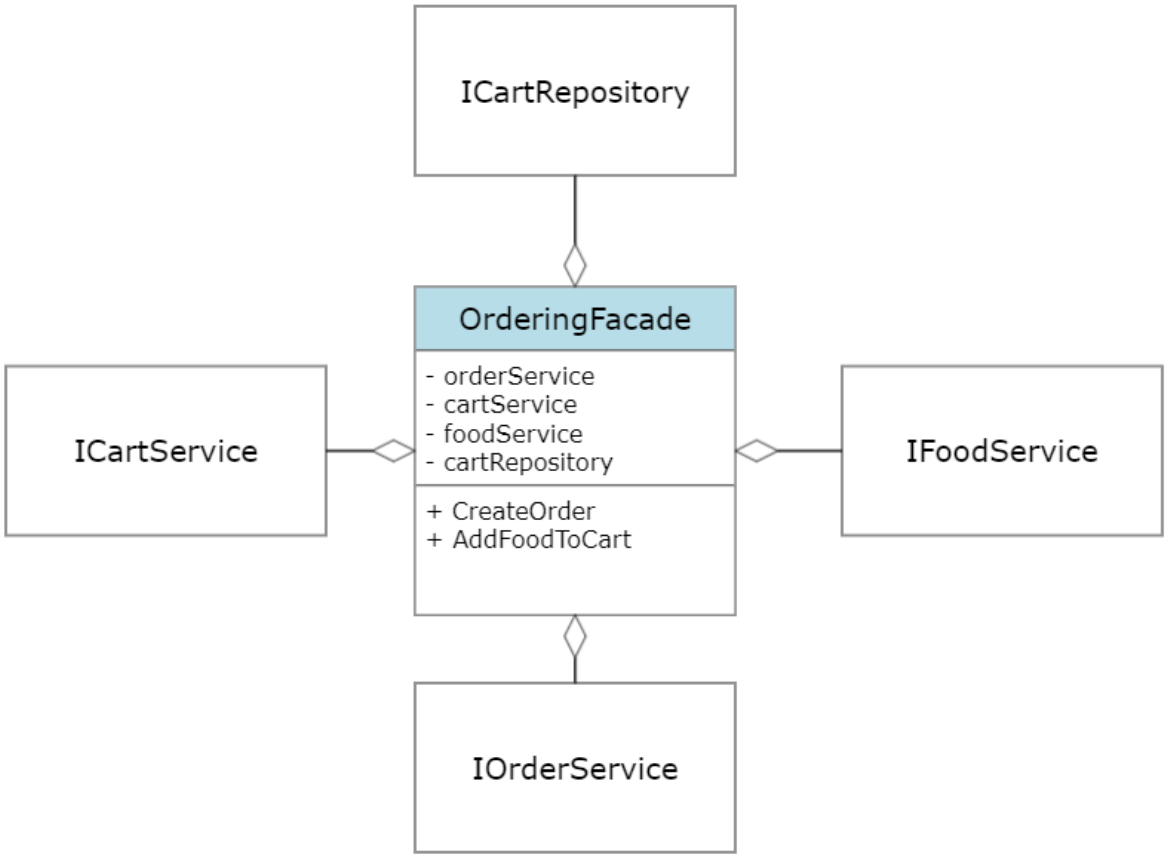
```
public class OrderContext
{
    5 usages
    public OrderState State { get; set; }

    1 usage   YelovSK
    public eOrderStatus OrderStatus => State.GetOrderStatus();

    1 usage   YelovSK
    public OrderContext(OrderState state)
    {
        State = state;
    }

    1 usage   YelovSK
    public void SetNextStatus()
    {
        State.SetNextStatus( context: this);
    }

    1 usage   YelovSK
    public static OrderState GetState(eOrderStatus status)
    {
        switch (status)
        {
            case eOrderStatus.Unpaid:
                return new UnpaidOrder();
            case eOrderStatus.Paid:
                return new PaidOrder();
            case eOrderStatus.Delivered:
                return new DeliveredOrder();
            default:
                throw new FoodOrderingException( message: "Invalid status");
        }
    }
}
```

```
public abstract class OrderState
{
    1 usage  3 overrides  YelovSK
    public abstract eOrderStatus GetOrderStatus();

    1 usage  3 overrides  YelovSK
    public abstract void SetNextStatus(OrderContext context);
}
```

```
public class UnpaidOrder : OrderState
{
    0+1 usages  YelovSK
    public override eOrderStatus GetOrderStatus() => eOrderStatus.Unpaid;

    0+1 usages  YelovSK
    public override void SetNextStatus(OrderContext context)
    {
        context.State = new PaidOrder();
    }
}
```

```
public class PaidOrder : OrderState
{
    0+1 usages  YelovSK
    public override eOrderStatus GetOrderStatus() => eOrderStatus.Paid;

    0+1 usages  YelovSK
    public override void SetNextStatus(OrderContext context)
    {
        context.State = new DeliveredOrder();
    }
}
```

DI




```
public class OrderingFacade
{
    private readonly IOrderService _orderService;
    private readonly ICartService _cartService;
    private readonly IFoodService _foodService;
    private readonly ICartRepository _cartRepository;

    YelovSK
    public OrderingFacade(IOrderService orderService, ICartService cartService, IFoodService foodService, ICartRepository cartRepository)
    {
        _orderService = orderService;
        _cartService = cartService;
        _foodService = foodService;
        _cartRepository = cartRepository;
    }
```

```
// Dependency injection - repositories
builder.Services.AddScoped<ICartRepository, CartRepository>();
builder.Services.AddScoped<IFoodRepository, FoodRepository>();
builder.Services.AddScoped<IOrderRepository, OrderRepository>();
builder.Services.AddScoped<IUserRepository, UserRepository>();
// Dependency injection - services
builder.Services.AddScoped<ICartService, CartService>();
builder.Services.AddScoped<IFoodService, FoodService>();
builder.Services.AddScoped<IOrderService, OrderService>();
builder.Services.AddScoped<IUserService, UserService>();
// Dependency injection - other
builder.Services.AddScoped<OrderingFacade>();
builder.Services.AddAutoMapper(AppDomain.CurrentDomain.GetAssemblies());
```

Class diagram pre vzor

Implementácia vzorov v scenároch prípadov použitia