The computer setup
Software Design (SDE)

Computer Science

Fall 2023

Introduction

In this exercise, you will create a UML class diagram for a computer setup. The system is designed to categorized different types of computers based on their specifications and features.

Requirements

Your computer setup, should a least contain the following classifiers:

- Computer (You should already have this)
- Processor
- Graphic Card
- Memory Module
- Hard drive
- Monitor

In these days, a computer can be more things. Find at least three types of computers and establish a the needed relationship type.

Exercises

1. Draw the classifiers as stated in the requirements above.
2. Define the structual and behavioural features for each of the classifiers.
3. Establish relationships between the classifiers and remember multiplicity.
4. Draw the three types of computers into the drawing.

Answers

Main components and classes

1. Computer
2. Laptop
3. Desktop
4. Tablet
5. Processor
6. MemoryModule
7. Hard drive
8. Monitor
9. GraphicsCard

Attributes and methods

Computer

- Attributes: Brand:string, Model:string, Price:float
- Methods: getBrand():string, getModel():string, getPrice:float

Laptop (Inherits from computer)

- Attributes: ScreenSize:float, Weight:float
- Methods: getScreenSize():float, getWeight():float

Desktop (Inherits from computer)

- Attributes: CaseType:string
- Methods: getCaseType():string

Tablet (Inherits from computer)

- Attributes: Brand:string, Model:string, ClockSpeed:float
- Methods: getBrand():string, getModel():string, getClockSpeed():float

Processor

- Attributes: Brand:string, Model:string, ClockSpeed:float, Cores: int
- Methods: getCapacity():int, getType():string, getCores(): int

Memory Module

- Attributes: Capacity:int, Type:string
- Methods: getCapacity():int, getType():string

Hard Drive

- Attributes: Capacity:int, Type:string
- Methods: getCapacity():int, getType():string

Monitor

- Attributes: Resolution:string, Size:float
- Methods: getResolution():string, getSize():float

GraphicsCard

- Attributes: Brand:string, Model:string, Vram:int
- Methods: getBrand():string, getModel:string, getVram():int

Relationships

inheritance relationships

- Laptop, Desktop and Tablet inherit from Computer class

Associations relationships

- Processor, Memory, Storage, Display and GraphicsCard are associated with Computer class.

Class diagram

Processor

- Brand: string
- Model: string
- ClockSpeed: float
- Cores : int

+ getBrand: string
+ getModel: string
+ getClcokSpeed : string
+ getCores(): int

Memory module

- Capacity: int
- Type: string

+ getCapacity: int
+ getSize: float

Hard drive

- Capacity: int
- Type: string

+ getCapacity: int
+ getSize: float

Computer

- Brand: string
- Model: string
- Price: float

+ getBrand(): string
+ getModel(): string
+ getPrice(): float

GraphicCard

- Brand: int
- Model: string
- vRAM: int

+ getBrand(): int
+ getModel(): string
+ getVRam(): int

Monitor

- Capacity: int
- Type: string

+ getCapacity: int
+ getSize: float

HAS   1..*   1   1   HAS   1   1   HAS   1..*   1   HAS

Laptop

- ScreenSize: float
- Weight: float

+ getScreenSize(): float
+ getWeight(): float

Desktop

- CaseType: string

+ getCaseType: string

Tablet

- ClockSpeed: float

+ getClockSpeed: string