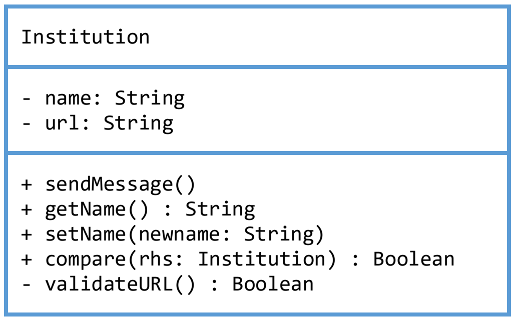
CSE 230 Problem Set 03

Problem 20.1: Institution Class

Create a class diagram from the following Kotlin code:

Kotlin

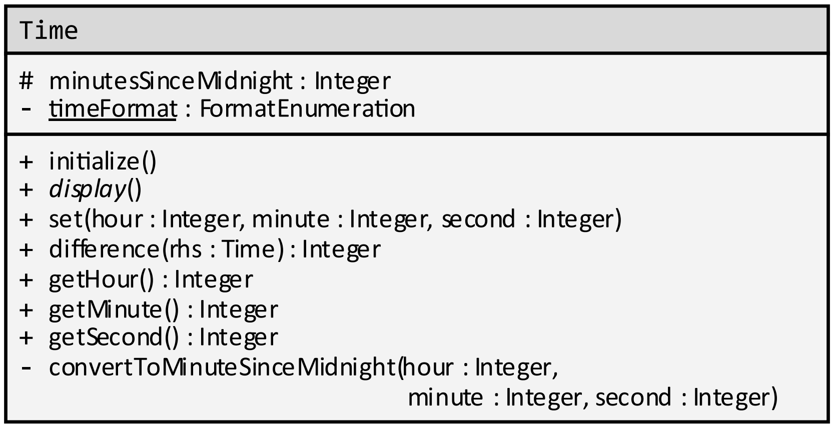
```kotlin
class Institution {
   private val name: String
   private val url: String

   fun sendMessage()

   fun getName(): String

   fun setName(newName: String)

   fun compare(rhs: Institution): Boolean

   private fun validateURL(): Boolean
}
```



```
Institution
-----------------------------------------
- name: String
- url: String
-----------------------------------------
+ sendMessage()
+ getName() : String
+ setName(newname: String)
+ compare(rhs: Institution) : Boolean
- validateURL() : Boolean
```

Problem 20.2: Time Class

Convert the following class diagram into C++.



Time

# minutesSinceMidnight : Integer
- <u>timeFormat</u> : FormatEnumeration

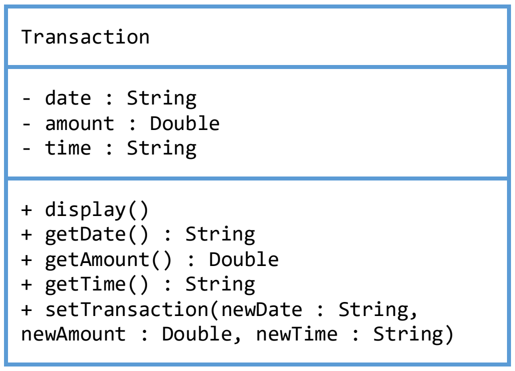
+ initialize()
+ *display*()
+ set(hour : Integer, minute : Integer, second : Integer)
+ difference(rhs : Time) : Integer
+ getHour() : Integer
+ getMinute() : Integer
+ getSecond() : Integer
- convertToMinuteSinceMidnight(hour : Integer,
minute : Integer, second : Integer)

```
 class Time
{
private:
        static FormatEnumeration timeFormat;
        void convertToMinuteSinceMidnight(int hour, int minute, int second);

public:
        void initialize();
        virtual void display();
        void set(int hour, int minute, int second);
        int difference(rhs : Time);
        int getHour();
        int getMinute();
        int getSecond();

protected:
        int minutesSinceMidnight;

}
```

Problem 20.3: Transaction

Create a class diagram matching the following scenario:

> A credit card transaction is a single instance of a credit card purchase. This transaction class will be used in a credit card class where an array of transactions will be stored. The credit card class will display the complete collection of transactions in a register, will sum up the various transactions to compute a balance, and will filter the transactions matching a certain criterion.
>
> Each transaction will contain the attributes you may find on your credit card statement. Look at your statement this month to see what those attributes are and how they are depicted.

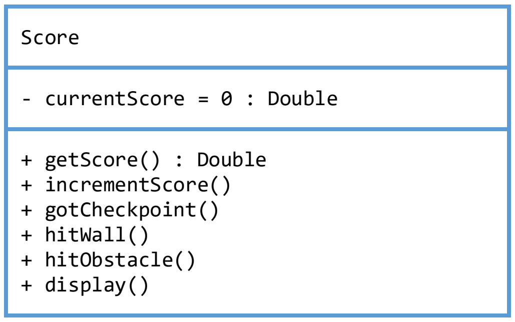


```
Transaction
-----------------------------------------
- date : String
- amount : Double
- time : String
-----------------------------------------
+ display()
+ getDate() : String
+ getAmount() : Double
+ getTime() : String
+ setTransaction(newDate : String,
newAmount : Double, newTime : String)
```

Problem 20.4: Score

Create a class diagram matching the following scenario:

> A video game contains a score class. This class will represent the score the current player has earned at a given moment in the game. The score will need to draw itself in the upper left-hand corner of the screen. The leaderboard class will need to be able to request the score at the end of the game so I can see if the current game ranks among the best played.
>
> The score will constantly be updated as the game progresses. Every second of gameplay, 1 point is added to the score. If the player makes it through a checkpoint, then 20 points are added. If the player hits a wall, then 5 points are deducted. If the player hits an obstacle other than then all, then 50 points are deducted.

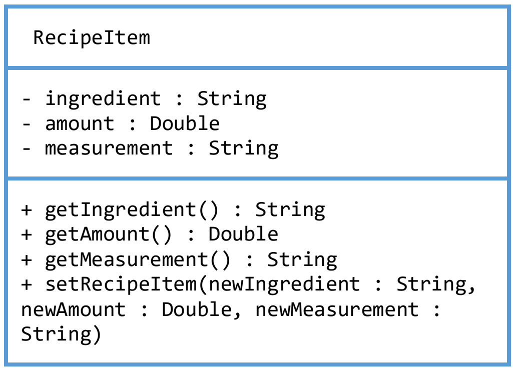


Problem 20.5: Recipe Item

Create a class diagram matching the following scenario:

> A recipe program contains a collection of recipes. Each recipe consists of a collection of recipe items. Your class will represent a single recipe item.
>
> Each recipe item will contain the attributes you may find on your favorite recipe.

Hint: Look at your favorite recipe or look at a recipe on the internet to see what those attributes are and how they are depicted.



```
RecipeItem

- ingredient : String
- amount : Double
- measurement : String

+ getIngredient() : String
+ getAmount() : Double
+ getMeasurement() : String
+ setRecipeItem(newIngredient : String,
newAmount : Double, newMeasurement :
String)
```