Exam Management System

1) Paper Class:

Paper class having attributes:

```
private String paperTitle;
private String paperID;
private String courseCode;
private String courseIncharge;
private String semester;
private String programName;
private Date paperDate;
private Time time;
private String examType;
private String invigilator;
private String location;
private int numOfStudents;
private int totalMarks;
```

After that a constructor named Paper which initialize all the instance variables

```
if(examType == "Mid Term") {
    totalMarks = 30;
}
else if(examType == "Final Term") {
    totalMarks = 100;
}
```

In a constructor this is a condition which used to check the ExamType and then assign Marks to the paper i.e. if the ExamType is Mid then this will assign 30 Marks otherwise for Final Marks will be 100.
After that there is a setter and getter methods for all the instance variables.

2) isCollected class:

isCollected is a subclass or child or derived class of Paper Class which we used for checking a paper status having attributes:

```
private String paperID;
private String courseCode;
private int numOfStudents;
private String setIsCollected;
```

after that there is constructor which initialize all the instance variable and there is superclass call.

```
/* this condition will check paper collection which is Boolean */
if(isCollected) {
    setIsCollected = "Paper Is Collected";
}
else {
    setIsCollected = "Paper isn't collected yet";
}
```

This constructor will check the Boolean variable for paper Status, if the isCollected is true the paper is collected otherwise false the paper is not collected.
There is come setter and getter methods.

3) Time class:

A Time class having two attributes:

```
private int hrs;
private int mints;
```

after that a constructor named Time which initialize the instance variable with some Validations which are:

```
if(hrs<0-1 || hrs>24)
    throw new IllegalArgumentException("Time must be in 0-23");
//check mints range
if(mints<0-1 || mints>60)
    throw new IllegalArgumentException("Mints must be in 00-60");
```

this condition will check Hours and Mints limits, if the hours are < or > to 0-24. The program will give you a console message “`IllegalArgumentException("Time must be in 0-23");`”
further by convention there is a set and get methods along with Validations.

4) Date Class:

Date class having three attributes:

```
private int month; // 1-12
private int day; // 1-31 based on month
private int year; // any year
```

after that is a static array named daysPerMonth having int data, which is set for months days.
There is constructor named Date which initilaze all the instance variable with some validations:

```
        // check if month in range
        if (month <= 0 || month > 12)
            throw new IllegalArgumentException("month (" + month + ") must be 1-12");

        // check if day in range for month
        if (day <= 0 || (day > daysPerMonth[month] && !(month == 2 && day == 29)))
            throw new IllegalArgumentException("day (" + day + ") out-of-range for the specified month and year");

        // check for leap year if month is 2 and day is 29
        if (month == 2 && day == 29 && !(year % 400 == 0 || (year % 4 == 0 && year % 100 != 0)))
            throw new IllegalArgumentException("day (" + day + ") out-of-range for the specified month and year");
```

These conditions will check the days and months limits.

5) Faculty class:

A Faculty class is used for a Faculty members data storing i.e. Name and ID.

6) Course class:

A course class is used for course data storing. This have attributes:

```
private final String courseName;
private String courseCode;
private final String programName="BS-CS";
private final String semesterCourse="Fall 2019";
```

after that a constructor named Time which initialize the instance variable with some Conditions which are:

```
if(courseCode == "CS-213") {
    semesterCourse = "Spring 2020";
}
else if(courseCode == "CS-102") {
    semesterCourse = "Fall 2019";
}
else if(courseCode == "BS-121") {
    semesterCourse = "Spring 2020";
}
```

this condition will check the course code and then assign him to the concern Year.

Test class or Main Method:

The program starts from main method. And we have a main method.

```
Paper[] Paper = new Paper[3];
```

This is an Array initialization in which we will store Paper Objects. i.e. Paper[0], Paper[1]…

And the same for faculty, paper status, and courses.

Here I used a switch functions toll executes a wanted method i.e.

For example, if we enter in case 1. The paper details methods will be starting execution. And in the paper details there also an input object which we used for objects and loop.

```
inputNum = inputForPaper.nextInt();
```

here if we put 1 then the loop will start executions and check all the papers for the Paper index and the loop where match then the paper will print out for user with the use of sout. And vice versa.

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