



### Objective:

- It will help you understand the basic 'class' keyword.
- The private/public and information hiding.

### Task-1: Time ADT

The Time ADT, which we discussed today in class. Remember to make data members private.

#### Members:

```
int hour;  
int minute;  
int second;
```

- 1.1. void setHour ( int h );
- 1.2. void setMinute ( int m );
- 1.3. void setSecond ( int s );
- 1.4. void setTime ( int h, int m, int s );
- 1.5. int getHour ( );
- 1.6. int getMinute ( );
- 1.7. int getSecond ( );
- 1.8. void printTwentyFourHourFormat(); // print universal time
- 1.9. void printTwelveHourFormat(); // print standard time
- 1.10. void incSec( int = 1 ); // increment in the second of the calling time object  
// default increment is 1
- 1.11. void incMin( int = 1 ); // increment in the minute of the calling time object  
// default increment is 1
- 1.12. void incHour( int = 1 ); // increment in the hour of the calling time object  
// default increment is 1

*Input Validation:* All Time object should have values of hour  $\geq 1$  and  $\leq 23$ . And minute and second in range  $\geq 1$  and  $\leq 59$

### Task-2: Circle ADT

Implement a class 'Circle', whose object will be responsible to store radius of the circle in it and on the basis of that the object will be able to calculate diameter and circumference of the circle.

```
class Circle  
{  
private:  
    float radius;  
public:  
    void setRadius( int ); // the setter for the radius data member  
    float getRadius( ); // the getter for the radius data member  
    float calcDiameter(); // returns the diameter i.e. 2*r  
    float calcCircumference(); //returns the circumference of the circle i.e. 2*π*r  
};
```

*Input Validation:* No circle object should have a radius  $\leq 0$ .



**Task-3:** Student ADT

Implement a class 'Student, whose object will be responsible for storing basic student information.

```
class Student
{
    char rollNo[11];           //roll no of student like BSEF14M001
    int semester;             //semester number
    char name[100];           //name of student
    float CGPA;
};
```

Add the following public functions in the Student class:

**Getter/setter:** you should know what to do with the setter/getter

```
void setRollNo(char *);
void setSemester( int );
void setName(char *);
void setCGPA(float);
```

```
const char * getRollNo();
int getSemester();
const char * getName()
float getCGPA();
```

```
bool isStudentDropOut(); //You get dropout if CGPA<1.5 in 1st semester
                        //You get dropout if CGPA<1.7 in 2nd and onward semester.
```

```
bool isStudentOnProbation(); //You get probation if CGPA>=1.5 and CGPA<2 in 1st semester
                        //You get probation if CGPA>=1.7 and CGPA<2 in 2nd and onward
                        //semester.
```

**Note:** Make sure that the integral part of rollno must be >=1 and <=999;

**Task-4:** Employee ADT

Create a class called **Employee** that includes three pieces of information as data members. A first name (type char[100]), a last name (type char[100]) and a monthly salary (type float).

- Provide a set and a get function for each data member. Monthly Salary should be >= 0.
- Write a member function that increases an employee's monthly salary by 10 percent.
- Write a test program that demonstrates class Employee's functionalities. Create two Employee objects and display each object's yearly salary. Then give each Employee a 10 percent raise and display each Employee's yearly salary again.