

## Class - Recipient.java

```
package OOP_Proj_1; //190199A
//Providing base class for all recipients.
//We do not want to create objects, so we declare it as abstract

abstract class Recipient {

    private static int no_of_recipient;
    // To have the count of number of recipients
    private String name;
    private String mail_address;
    // -----

    //constructor
    public Recipient(String inp_name, String inp_mail) {
        this.name = inp_name; //setting the name ...
        this.mail_address = inp_mail; //setting the mail
        no_of_recipient = get_No_of_recipient() + 1;
        //when creating object, count should be increased
    }
    // -----

    public String getName() { //getter for name
        return name;
    }

    public String getMail_address() { //getter for mail address
        return mail_address;
    }

    public static int get_No_of_recipient() { //getter for the count of number of recipients
        return no_of_recipient;
    }
    //no setters as this are only read only
}
```

## Class - Official\_recipient.java

```
package OOP_Proj_1;

//Official recipient is a sub class of recipient

class Official_recipient extends Recipient {
    private String designation;

    // -----

    //Constructor

    public Official_recipient(String inp_name, String inp_mail, String inp_designation) {

        super(inp_name,inp_mail);
        //Calling super class constructor to initialize name and mail
        this.designation = inp_designation;
    }

    // -----

    public String getDesignation() {
        //getter for designation
        return this.designation;
    }
    //no setters as this is only read only
}
}
```

## Class - Official\_close\_friend.java

```
package OOP_Proj_1;

import java.time.LocalDate; //since this class has date attrinute

//subclass of Official_recipient and also implements Birthday_wish_sendable interface..

class Official_close_friend extends Official_recipient implements Birthday_wish_sendable{
    private LocalDate birth_date; //encapsulation
    // -----

    //constructor
    public Official_close_friend(String inp_name, String inp_mail, String inp_designation, LocalDate inp_birthday) {

        super(inp_name, inp_mail, inp_designation);
        //calling super class constructors initialize
        this.birth_date = inp_birthday;
    }
    // -----

    //no setters as this is read only
    public LocalDate getBirth_date() { //getter for get birthday
        return birth_date;
    }

    //implementing interface method ..
    @Override
    public String get_wish_text() {
        //function to send the body of the birthday wish email
        return "Wish you a Happy Birthday. With regards, Gopi";
    }
}
```

## Class - Personal\_recipient.java

```
package OOP_Proj_1;

import java.time.LocalDate; //since this class has date attribute

//subclass of Recipient and also implements Birthday_wish_sendable interface..

class Personal_recipient extends Recipient implements Birthday_wish_sendable {
    private String nick_name; //encapsulation
    private LocalDate birth_date; //only getters.. no setters as read only
    // -----

    public Personal_recipient(String inp_name,String inp_nick_name, String inp_mail, LocalDate inp_birthday) {

        super(inp_name,inp_mail);
        this.nick_name = inp_nick_name;
        this.birth_date = inp_birthday;
    }

    // -----

    public String getNick_name() { //getters for nickname
        return nick_name;
    }

    public LocalDate getBirth_date() { //getters for birthdate
        return birth_date;
    }
    //implementing interface method ..
    //function to send the body of the birthday wish email
    @Override
    public String get_wish_text() {
        return "hugs and love on your birthday. Lovely wishes from Gopi";
    }
}
```

## Interface - Birthday\_wish\_sendable.java

```
package OOP_Proj_1;

import java.time.LocalDate;

interface Birthday_wish_sendable {

    //To get body of the birthday wish text
    public String get_wish_text();

    //To get birthdate of recipients who can be wishable
    public LocalDate getBirth_date() ;

}
```

## Email\_Client.java

```
// My index number : 190199A
// Shanmugavadivel Gopinath
// OOP Project - 1
// This is responsible to get user input
// This class consists main method

package OOP_Proj_1;
//import libraries
import java.io.IOException; // for error handling
import java.util.Scanner; //for getting inputs
import javax.mail.MessagingException; //for handling inputs which can be occurred during mail sending process

// -----

class Email_Client {

    public static void main(String[] args) throws IOException, MessagingException {
        //creating an object of email process system to handle user's needs

        Email_processing_system mail_system = new Email_processing_system();
        //When programme start, it want to load the recipients form text file stored in hard disk.
        mail_system.load_recipients();

        ////When programme start, it want to load the old mails form serilization file stored in hard disk.
        mail_system.load_mails();

        //When programme start, it want to send mails to people who have birthday on that day
        mail_system.wish_today_birthday();

    }
    // -----
}
```

```
Scanner scanner = new Scanner(System.in); //Creating Scanner objects to receive inputs
Scanner scanner1 = new Scanner(System.in);
```

```
System.out.println("Enter option type: \n" //to ask user to select the functionality
+ "1 - Adding a new recipient\n"
+ "2 - Sending an email\n"
+ "3 - Printing out all the recipients who have birthdays\n"
+ "4 - Printing out details of all the emails sent\n"
+ "5 - Printing out the number of recipient objects in the application");
```

```
int option = scanner.nextInt(); //getting input to ask user to select the functionality
```

```
// -----
switch(option){
```

```
    case 1: //if we want to add a new recipient
        //Input format is same as in text file
        System.out.println("Enter Your new entry in classical format: ");
        String new_recipient_details = scanner1.nextLine();
        //getting inputs
        // asking mail system to handle inputs and create new recipient
        mail_system.create_recipient_entry(new_recipient_details);
        break;
```

```
// -----
```

```
    case 2: //If you want to Send an email
        System.out.println("Enter Your new email details... input format - email, subject, content ");
        String inp_for_mail_send = scanner1.nextLine(); //gettign inputs
        //asking mail system to handle send request
        mail_system.send_mail(inp_for_mail_send);
        break;
```

```
// -----

    case 3: // If you want to Print out all the recipients who have birthdays
        System.out.println("Enter the date in yyyy/MM/dd form: ");
        String input_date = scanner1.nextLine(); //getting the user input
        //asking mail system to print out
        mail_system.check_birthday(input_date);
        break;

// -----

    case 4: //Printing out details of all the emails sent on particular date
        System.out.println("Enter the date in yyyy/MM/dd form: ");
        String input_date1 = scanner1.nextLine(); //getting the date
        //asking mail system to print out the query
        mail_system.check_email_this_date(input_date1);
        break;

// -----

    case 5: // Printing out the number of recipient objects in the application
        System.out.println("Total Number of recipient object in the application is.... finding.....");
        //asking mail system to print out the query
        System.out.println(mail_system.find_total_recipients());
        break;

}
scanner.close();           //closing the scanners
scanner1.close();

}
}
```



## Class- Email\_processing\_system.java

```
//This object of this class recieves user queries from Email_cilent class .. and does the processing
// When the process is smaller, Object is sufficient to process the request
// If the process is larger it calls sub_division processing objects to do processing

//Importing the packages
package OOP_Proj_1;
import java.io.File;
import java.io.FileNotFoundException;
import java.io.IOException; // Import the IOException class to handle errors
import java.time.LocalDate;
import java.time.format.DateTimeFormatter;
import java.util.ArrayList;
import java.util.Scanner;
import javax.mail.MessagingException;

class Email_processing_system {
    //Attributes
    ArrayList<Birthday_wish_sendable> birthday_wishers; // Polymorphism - We store Birthday_wish_sendable objects
here
    Mail_history_processor mail_history_processor; // this processes the mail history and serialize mails
    Recipient_entry_adder recipient_entry_adder; // This creates new reciepients

    // -----

    //When we create email_processing_system object, We want other helping objects also want to be initiated
    public Email_processing_system() {
        mail_history_processor = new Mail_history_processor();
        recipient_entry_adder = new Recipient_entry_adder();
        birthday_wishers = new ArrayList<Birthday_wish_sendable>();
    }

    // -----
```

```

//When programme starts, it should load recipients from text file...
//We need to read information from text file and call the sub division (recipient_entry_adder)
// recipient_entry_adder will process the information and create recipients
public void load_recipients() throws IOException {
    try {
        File myObj = new File("src/clientList.txt"); //file path
        Scanner myReader = new Scanner(myObj); //reading text file

        while (myReader.hasNextLine()) {
            String data = myReader.nextLine();
            //calling recipient_entry_adder.. this will process and return the recipient object

            Recipient recipient1 = recipient_entry_adder.recipient_object_creator(data,true);
            //if the recipient object can be wishable, then add it to our array list
            if(recipient1 instanceof Birthday_wish_sendable) {
                birthday_wishers.add((Birthday_wish_sendable)recipient1);
            }
        }
        myReader.close(); //closing the file writer
    }
    catch (FileNotFoundException e) { //Handling exception
        System.out.println("An error occurred.");
        e.printStackTrace();
    }
}

```

// -----

```

//When programme starts, it should send wish email to people who have birthday today
public void wish_today_birthday() throws MessagingException {
    LocalDate today_date = LocalDate.now(); //getting today date

    for(Birthday_wish_sendable obj : birthday_wishers ) { //iterate birthday_wishers arraylist
        LocalDate temp_date = obj.getBirth_date(); //get birthdate of object from abstract function
    }
}

```

```

        //if today and object's month& date values are equal
        if(temp_date.getMonthValue()==today_date.getMonthValue() &
temp_date.getDayOfMonth()==today_date.getDayOfMonth()) {
            String body = obj.get_wish_text(); //get birthday-mail body from method of interface
            String subject = "Happy Birthday!!!!"; //our subject
            // we need to cast from the interface reference to recipients reference to get address...
            Recipient casted_obj = (Recipient)obj;
            String reciever_mail = casted_obj.getMail_address(); // we get mail address using getter
            Mail bd_mail = new Mail(reciever_mail,subject,body ); // we create new mail object
            bd_mail.sendMail(); //we send the mail
            mail_history_processor.add_to_history(bd_mail); //we add the sent mail to history
        }
    }
}

// -----

//When programme starts, it should load mail objects from serialization file...
//we should call the sub division (mail_history_processor)
//That will serialize mail objects from mail
public void load_mails() {
    mail_history_processor.load_old_mails();
}

// -----

//If user selects one ...
//if we want to add a new recipient , we should call sub division (recipient_entry_adder)
// recipient_entry_adder will process the information and create recipients
public void create_recipient_entry(String new_recipient_details) throws IOException {
    Recipient recipient = recipient_entry_adder.recipient_object_creator(new_recipient_details,false);
    if(recipient instanceof Birthday_wish_sendable) {
        birthday_wishers.add((Birthday_wish_sendable)recipient);
    }
}

// -----

//If user selects two... Send Email..
//We trim and split the user input and we create new mail object and send it

```

```

public void send_mail(String inp_for_mail_send) throws MessagingException {
    String[] mail_data = inp_for_mail_send.split(","); //We extract information
    if(mail_data.length==3) { //checking whether valid input
        String reciever_mail = mail_data[0].trim(); // mail address
        String subject = mail_data[1].trim(); //subject
        String body = mail_data[2].trim(); //body
        Mail new_mail = new Mail(reciever_mail,subject,body ); // creating new mail object
        new_mail.sendMail(); //we send the mail using method of it own
        mail_history_processor.add_to_history(new_mail);
        //After sending, we need to add to the history,,so we call mail_history_processor
    }
}

// -----

//If user selects three... Print out all the recipients who have birthdays in particular day
public void check_birthday(String input_date) {
    DateTimeFormatter formatter = DateTimeFormatter.ofPattern("yyyy/MM/dd"); //Defining date format
    LocalDate recipient_birthdate = LocalDate.parse(input_date,formatter); //Changing string to date object
    System.out.println("Names of recipients who have their birthday set to current date"); //output
    for(Birthday_wish_sendable obj : birthday_wishers ) { //iterate thorough our birthday_wishers arraylist

        LocalDate temp_date = obj.getBirth_date(); //getBirth_date() abstract function to get birthdate
        if(temp_date.getMonthValue()==recipient_birthdate.getMonthValue() &
temp_date.getDayOfMonth()==recipient_birthdate.getDayOfMonth()) {

            //If month& date values are equal then we need to cast from the interface reference to
            recipients reference...
            Recipient casted_obj = (Recipient)obj;
            //By casting we can access the names of the recipients
            System.out.println(casted_obj.getName()); // calling getters to print names
        }
    }
}

```

```
// -----  
  
    //If user selects four... Printing out details of all the emails sent on particular date  
    public void check_email_this_date(String input_date) {  
        DateTimeFormatter formatter = DateTimeFormatter.ofPattern("yyyy/MM/dd"); //We define the pattern  
        LocalDate date = LocalDate.parse(input_date,formatter); //convert string to date object  
        mail_history_processor.check_mails_this_day(date); // call mail_history_processor to print the mail info  
    }  
  
// -----  
  
    /// If user selects five, Printing out the number of recipient objects in the application  
    // we keep a static variable in recipient base class to keep count  
    public int find_total_recipients() {  
        return Recipient.get_No_of_recipient(); //we call the getter  
    }  
  
}
```

## Class - Mail.java

```
package OOP_Proj_1;
// This class is responsible for creating mail objects
// This class describes the functionality of mail objects eg: mail send
//importing libraries needed for sending mail
import java.io.Serializable;
import java.time.LocalDateTime;
import java.util.Properties;
import javax.mail.Authenticator;
import javax.mail.Message;
import javax.mail.MessagingException;
import javax.mail.PasswordAuthentication;
import javax.mail.Session;
import javax.mail.Transport;
import javax.mail.internet.AddressException;
import javax.mail.internet.InternetAddress;
import javax.mail.internet.MimeMessage;

class Mail implements Serializable {
    //because mail object needed to be serializable
    /**
     *
     */
    private static final long serialVersionUID = 1L;
    private String receipient; //Attributes of a Mail object
    private String subject;
    private String text; //body of mail
    private LocalDateTime sent_time; //time when mail has sent

    // -----
    //Constructor
    public Mail(String inp_receipient, String inp_subject, String inp_text) {
        //initializing mail objects
        this.receipient = inp_receipient;
        this.subject = inp_subject;
        this.text = inp_text;
    }
}
```

```

}

//Here we use getters... We need to set only time.. So we define setter only for time
public String getReceipient() {
    return receipient;
}

public String getSubject() {
    return subject;
}

public String getText() {
    return text;
}

public LocalDateTime getSent_time() {
    return sent_time;
}

// -----

//This method describes the sendMail function of mail objects
public void sendMail() throws MessagingException{

    System.out.println("Message is prepareing to send..."); //Signaling

    Properties properties = new Properties(); //describing properties for gmail

    properties.put("mail.smtp.auth", "true");
    properties.put("mail.smtp.starttls.enable", "true");
    properties.put("mail.smtp.host", "smtp.gmail.com");
    properties.put("mail.smtp.ssl.trust", "smtp.gmail.com");
    properties.put("mail.smtp.port", "587");

    //cilent's mail information
    String mailAddress = "shangopimora@gmail.com";
    String password = "gopinath";

```

```

//Creating Session object
Session session = Session.getInstance(properties,new Authenticator() {
    @Override
    protected PasswordAuthentication getPasswordAuthentication() {
        return new PasswordAuthentication(mailAddress, password);
    }
});

//Sending the messege to next function
Message msg = prepareMessage(session, mailAddress, this.receipient, this.subject, this.text);
this.sent_time = LocalDateTime.now(); //Assigning time for the mail objects

Transport.send(msg); //send

System.out.println("Message sent successfully..."); //successfully sent
}

// -----
//This static function sends the messege provided
private static Message prepareMessage(Session session, String mailAddress, String receipient, String subject,
String Text) {
    Message msg = new MimeMessage(session);
    try {
        msg.setFrom(new InternetAddress(mailAddress));
        msg.setRecipient(Message.RecipientType.TO, new InternetAddress(receipient));
        msg.setSubject(subject); //sets subject
        msg.setText(Text); //sets Text
        return msg;
    } catch (AddressException e) { //if mail address is wrong
        e.printStackTrace();
    } catch (MessagingException e) {
        e.printStackTrace();
    }
    return null;
}
}
}

```



## Class – Sub\_division.java

```
package OOP_Proj_1;

abstract class Sub_division {
    //We have a Email processing Class as backend process
    //It implements the functionalities ..
    // When the implementation is bigger, Solving all process in same process(Class) is not good
    // So Big implementation are moved to small divisions
    // All small divisions run under this class
    // We have Mail_history_Processor, Recipient_entry_adder subdivisions are under this class
}
```

## Class - Recipient\_entry\_adder.java

//This class is a subclass of sub\_division is responsible for processing user inputs and create new recipient objects  
//When program start, it needed to load all recipient objects from text file.. This class has methods to do it,,

```
package OOP_Proj_1;
//importing input output libraries and Date libraries
import java.io.File;
import java.io.FileWriter;
import java.io.IOException;
import java.time.LocalDate;
import java.time.format.DateTimeFormatter;

class Recipient_entry_adder extends Sub_division {
    //This class don't have any Attributes
    // -----

    // We need to process user input and create & return recipient objects
    public Recipient recipient_object_creator(String new_recipient_details, boolean is_loading) throws IOException{
        // new_recipient_details Inputs will be in this format
        // Official: nimal,nimal@gmail.com,ceo
        // Office_friend: kamal,kamal@gmail.com,clerk,2000/12/12
        //Personal: sunil,<nick-name>,sunil@gmail.com,2000/10/10

        //We will call this function in two incidents...
        //When programme starts, we need to load recipients from text files.. in that time is_loading = true
        //When user wants to create new recipient, in that time is_loading = false
    // -----

        Recipient recipient = null; //initializing recipients

        //First We need to know what type of recipient.. So we split the String and assign it to an array
        String[] temp_array = new_recipient_details.split(" ");
```

```

//temp_array[1] hold infomrmation regarding recipients... We split it to extract that information.
String[] recipient_data = temp_array[1].split(",");
int temp_array_size = temp_array.length; // It should be 2.. or we should raise error
int recipient_data_size = recipient_data.length; // It should be constant for particular type of
recipients
String test_case = temp_array[0].toLowerCase(); //We should neglect case difference
// -----
//Here we want to write the new recipient to text files too
File file = new File("src/clientList.txt"); // Path if text file
FileWriter writer_1 = new FileWriter(file, true); //We want to append ...so we assign true

// -----
//If official
if(test_case.startsWith("official") & temp_array_size==2 & recipient_data_size==3) {
    String recipient_name= recipient_data[0]; //name
    String recipient_mail = recipient_data[1]; //mail
    String recipient_designation = recipient_data[2]; //designation
    Official_recipient official_receipient = new Official_recipient(recipient_name,
recipient_mail,recipient_designation);
    recipient = official_receipient; //We create official recipient object

    if(!is_loading) { //if we are creating objects from user input and not from text file
        writer_1.write(new_recipient_details); // We want to write it to text file
        System.out.println("Official recipient Entry added successfully!!! Your last entry was " +
official_receipient.getName());
    }
}

// -----

//If office_friend
else if(test_case.startsWith("office_friend") & temp_array_size==2 & recipient_data_size==4) {
    String recipient_name= recipient_data[0]; //name
    String recipient_mail = recipient_data[1]; //mail
    DateTimeFormatter formatter = DateTimeFormatter.ofPattern("yyyy/MM/dd"); //Date formatter style
    String recipient_designation = recipient_data[2]; //designation
    LocalDate recipient_birthdate = LocalDate.parse(recipient_data[3],formatter); //Formatting bd

```

```

        Official_close_friend official_friend = new Official_close_friend(recipient_name, recipient_mail,
recipient_designation, recipient_birthdate);
        recipient=official_friend; //Creating Official friend object

        if(!is_loading) { //if we are creating objects from user input and not from text file
            writer_1.write(new_recipient_details); // We want to write it to text file
            System.out.println("Official friend recipient Entry added successfully!!! Your last entry
was " + official_friend.getName());
        }

    }

// -----

//If personal reciepoint
else if(test_case.startsWith("personal") & temp_array_size==2 & recipient_data_size==4 ) {
    String recipient_name= recipient_data[0]; //name
    String recipient_nickname = recipient_data[1]; //nick -name
    String recipient_mail = recipient_data[2]; //mail
    DateTimeFormatter formatter = DateTimeFormatter.ofPattern("yyyy/MM/dd"); //Date formatter style
    LocalDate recipient_birthdate = LocalDate.parse(recipient_data[3],formatter); //Formatting bd
    Personal_recipient personal_recipient = new Personal_recipient(recipient_name, recipient_nickname,
recipient_mail, recipient_birthdate);
    recipient = personal_recipient; //Creating personal friend object

    if(!is_loading) { //if we are creating objects from user input and not from text file
        writer_1.write("\n"+new_recipient_details ); // We want to write it to text file
        System.out.println("Personal friend recipient Entry added successfully!!! Your last entry
was " + personal_recipient.getName());
    }

}

else { // If don't include in any of above cases, Then there should be problem with the input
    System.out.print("Invalid Input. Please Try again later");
}

writer_1.close(); //Closing the writer
return recipient; //We return the reciepoint object created now
}
}

```

## Class – Mail\_history\_processor.java

//This class is a subclass of sub\_division is responsible for managing history of sent mail  
//This will serialize and deserialize Mail object in ArrayList structure between JVM and Local machine

```
package OOP_Proj_1;
//importing libraries needed for serialization
import java.io.FileInputStream;
import java.io.FileOutputStream;
import java.io.IOException;
import java.io.ObjectInputStream;
import java.io.ObjectOutputStream;
import java.time.LocalDate;
import java.util.ArrayList;

class Mail_history_processor extends Sub_division {
    ArrayList<Mail> mail_history; // THis arraylist consists the history of sent mail
// -----

    //When Sub division get activated it should create new ArrayList.. We create in constructor
    public Mail_history_processor() {
        mail_history = new ArrayList<Mail>();
    }
// -----

    //When user sends email, we need to store to history
    //THis method is used to add mails to the history
    public void add_to_history(Mail mail) {
        mail_history.add(mail); //We add this in our arraylist
        //We have to write it in local file (Serialize)
        try {
            FileOutputStream fop=new FileOutputStream("object.ser"); //file path
            ObjectOutputStream oos=new ObjectOutputStream(fop);
            oos.writeObject(mail_history); //here we serialize Mail object in ArrayList form
            oos.close(); //closing outputstream
        } catch (IOException e) { //Catch some exception
            System.out.println(e);
        }
    }
}
```

```

    }

// -----

//When programme start, we need to read the serialzied file and want to create mail objects
//We want to de-serialize the object.ser file
public void load_old_mails(){
    try {
        FileInputStream fis=new FileInputStream("object.ser"); //file path
        ObjectInputStream ois=new ObjectInputStream(fis);
        mail_history =(ArrayList<Mail>)ois.readObject(); //here we read the file and cast it as
ArrayList<mail>

        //We have now de-serialized mail objects from file in the form of ArrayList Structure
        ois.close(); //We close input input stream

    }

    catch(Exception e) { //Catch some exception
        System.out.println("Error");
    }

}

// -----

//Sometimes mail_processing_system needs information of mails sent on particular date ..Here we process it
public void check_mails_this_day(LocalDate date) {
    for(Mail mail : mail_history) { //We itearte our mail_history ArrayList
        if(mail.getSent_time().toLocalDate().equals(date)) { //If given date and mail_sent_date are equal
            System.out.println("Subject : "+ mail.getSubject()); //Then give mail information
            System.out.println("Recipient : "+ mail.getReceipient());
        }

    }

}

}

```