# Objective

In this assignment you will be practicing the concepts of inheritance, extending a class, subclass, superclass. Also, you will be practicing calling the methods from the super class in the subclass.

# Problem

Create an Email application with the following functionality

* Create an email and send it to the recipient and/or CC some other recipients
* Forward an email that was sent previously to some recipients
* Modify the attributes of the email that has been created but has not been sent yet. Note that an email that has been sent out cannot be modified. Attributes that may be modified are
  + sender
  + subject
  + recipient
  + content

# Creativity

Feel free to be creative to add more functionality to this app. As long as your code satisfies all the requirements, you can implement the code based on your own logic.

# Implementation

An **Email is a document** with more specific information such as sender, subject, recipient, and date. Therefore, we should implement the following three classes.

1. Document class (superclass, general class)
2. Email class (subclass, more specialized class)
3. Driver/tester class

# Document class

|  |
| --- |
| Document |
| -String content |
| +Document (String text)  +getContent(): String  +setContent(String text): void  +toString() : String  +getLContentLength(): int  +contains(String keyword) : boolean  +equals(Document other) |

# Document class methods

The following methods must be implemented. However, some of them might not be called or used in this assignment.

* **public Document (String text):** this constructor accepts a parameter of type String and initializes the instance variable content to this parameter
* **public String getContent():** this method returns the instance variable content
* **setContent(String newContent():** This method changes the instance variable content to the new content
* **toString() :** This method creates a String representing an object of Document and then returns it.
* **public int getContentLength():** this method returns the length of the String content and returns it. to find the length of a String the length method from the String class should be used. content.length() will give you the number of the letters in the variable content.
* **public Boolean contains (String keyword):** this method returns true if the instance variable content contains the keyword. you can use the contains method from the string class. content.contains(keyword) should be used in this method
* **public Boolean equals (Document other):** this method compares two objects of type Document. returns true if the two Document objects are the same and returns false otherwise. The code that can be used is: this.content.equalsIgnoreCase(other.content)

# Email class: this class extends the Document class.

|  |
| --- |
| Email |
| -String sender  -String recipient  -Date date //date of the email  -String subject // email subject  -String cc //list of the people to be copied  -boolean iSent //specifies if the email has been sent |
| +Email (String text, String sender, String recipient, String subject, String cc)  +public send (): void  +public forward (String recipient, String cc)  +public getIsSent(): Boolean  +public getSender(): String  +public getRecipient(): String  +public getSubject(): String  +public getCC(): String  +public getDate(): Date  +public setSender(String sender): void  +public setRecipient(String recipient)  +public setSubject(String subject): void  +public setCC(String cc): void  +public toString(): String  +public modifyContent(String newText): void  +public forward(String rec, String sender String cc): Email  +public toString(): String |

# Email Class methods

You are required to implement all the methods. Some of them might not be called.

* **public Email (String text, String sender, String recipient, String subject, String cc):** this constructor initializes the instance variables to the given parameters. to set the instance variable date use the code: date = new Date(). Date is a prewritten java class that can be used.
* **public void send():** this method sets the instance variable isSent to true meaning that this email has been sent.
* **public boolean getSent():** returns the instance variable isSent
* **public String getSender**(): returns the instance variable sender
* **public String getRecipiant**(): returns the instance variables recipient
* **public String getSubject**(): returns the instance variable subject
* **public String getCC**(): returns the instance variable cc
* **public Date Date**(): returns the date instance variable
* **public void setSender(String s**): this method must check the instance variable isSent. if it is false that means the email has not been sent yet and the sender can be modified. Otherwise the sender cannot be modified since the email has already been sent. The following code can be used

public void setSender(String s){ if(isSent == false) sender = s; else System.out.println(“This email has been sent and cannot be modified”);

* **public void setRecipiant(String r**): this method must check the instance variable isSent. if it is false that means the email has not been sent yet and the recipient can be modified. Otherwise the recipient cannot be modified since the email has already been sent.
* **public void setSubject(String s**): this method must check the instance variable isSent. if it is false that means the email has not been sent yet and the subject can be modified. Otherwise the subject cannot be modified since the email has already been sent.
* **public void setCC(String c**): this method must check the instance variable isSent. if it is false that means the email has not been sent yet and the cc can be modified. Otherwise the cc cannot be modified since the email has already been sent.
* **public String toString():** this method creates a String representing the Email object. this String must include the sender, recipient, subject, date and the content of the email. Note that the instance variable content is declared in the Document class and you need to call the toString method from the Document class: super.toString() should be used in this method
* **public void modifyContent (String s):** this method must check the instance variable isSent. if it is false that means the email has not been sent yet and the content can be modified. Otherwise the cc cannot be modified since the email has already been sent. Since instance variable content is declared in the Document class (Super class), therefore to modify the content this code is needed: super.setContent(s)
* **public Email forward (String rec, String sender String cc**): this method is going to forward an email that was previously sent to the new recipients and cc . This method must create a new Email object. Use the following code:

Email f = new Email (this.getText(), sender, rec, this.subject, cc);  
f.date = new Date();  
f.isSent = true;  
return f;

# Driver class

Some code has been provided in this class. After you are done with the Document class and the Email class, add the following to the Driver class.

# This class should utilize all the methods implemented in the Email class.

1. create two objects of the Email class called e1, and e2
2. send the email
3. call the setter methods on the email e1
4. forward the email e1
5. display the email e1
6. forward the email e1
7. call the setter methods on the email e2
8. modify the content on the email e2
9. call the method getDocumentLength on the email e2
10. call the method contains on the email e2 with the word of your choice.
11. send the email e2
12. display the email e2

# optional

Feel free to add any functionalities to this application

# Sample output

After implementing the Document class and the Email class, uncomment the code in the driver class. If you implemented the code correctly you should get the following output.

Sender: Gita Faroughi  
Recipiant: Alex  
CC:   
Subject: Meeting  
Date: Wed Sep 15 15:37:48 PDT 2021  
Content: Hello everyone, we will have a meeting tomorrow at 10  
  
  
  
The word tomorrow was found in the email  
  
The content of this email is: Hello everyone, we will have a meeting tomorrow at 10  
  
This email has been sent and the content cannot be modified  
This email has been sent and the recipeint cannot be chaanged  
  
  
forwarded message  
Sender: Gita  
Recipiant: Alex  
CC: Maria  
Subject: Meeting  
Date: Wed Sep 15 15:37:48 PDT 2021  
Content: Hello everyone, we will have a meeting tomorrow at 10  
  
The number of the letters in the email is: 53