

**Title:**

Email Application Scenario: You are an IT Support Administrator Specialist at Yanbu University College - YUC. You are charged with the task of creating email accounts for new students.

**Objective(s):**

- Able to identify a problem from real context.
- Able to propose solution using a suitable OOP Design.
- Demonstrate object-oriented approach-information hiding, encapsulation.
- Codes implementation free from syntax and logical error.
- Demonstrate uniqueness and individual creativity to deliver information.

**Problem Analysis:**

The project is about to ask the students to enter their First Name, Last Name, Date of Birth, Alternative Email, And department Letter.

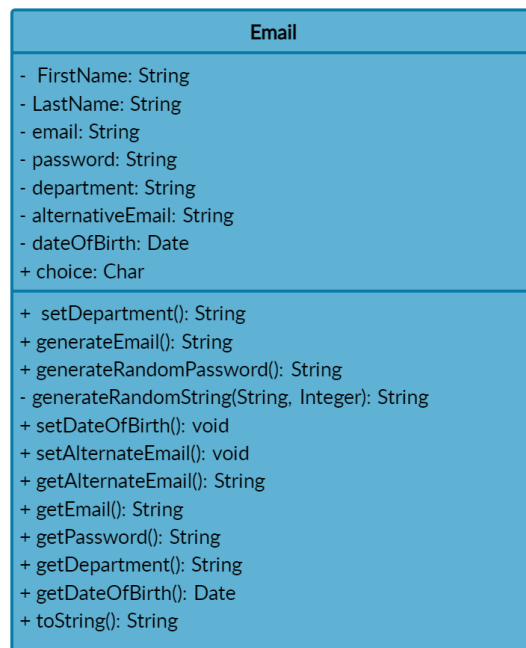
Then create a random password for each one and generate an Email also.

After that, Display all the Students Details.

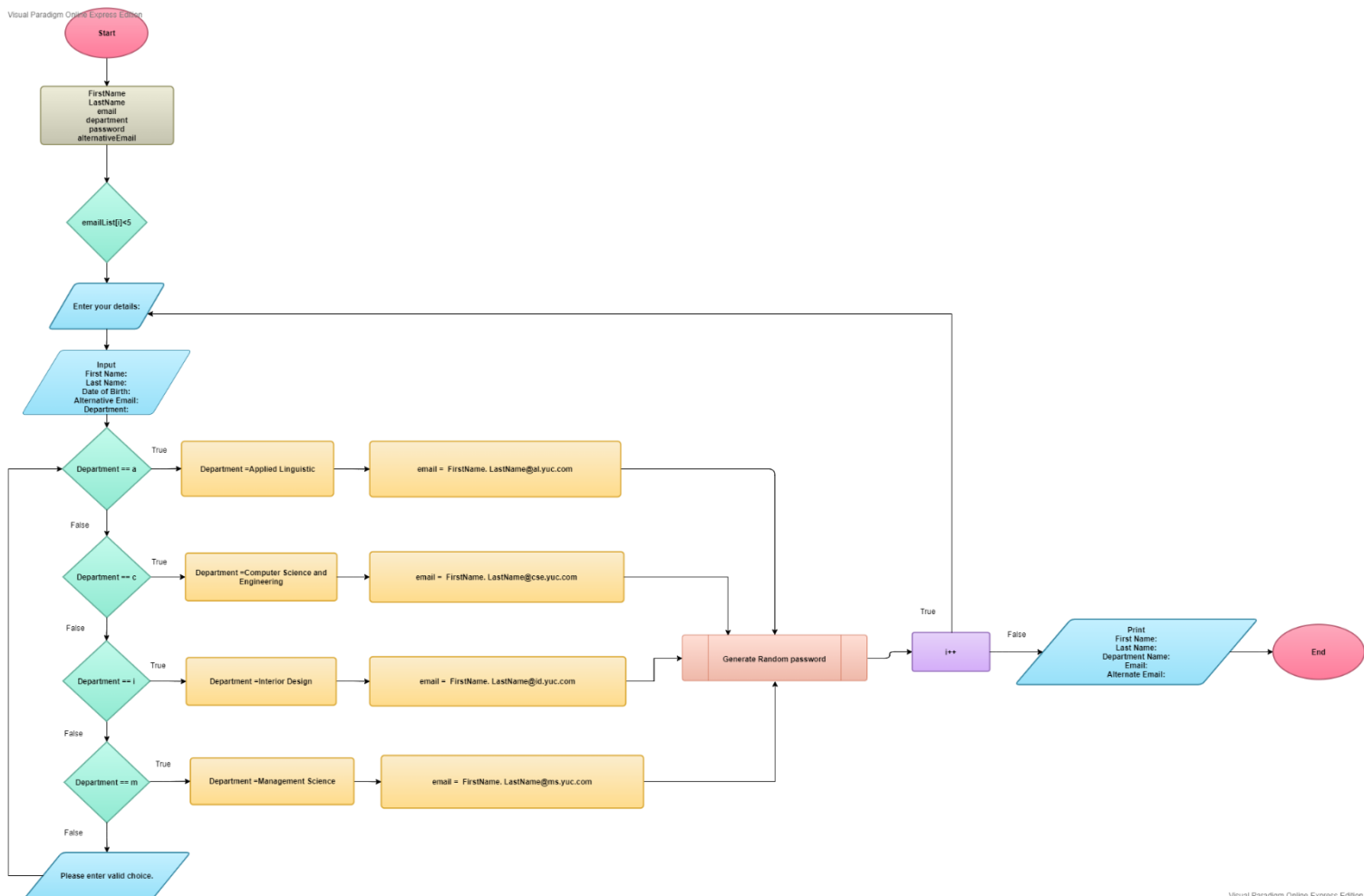
- The input variables shall be: First Name, Last Name, Date of Birth, Alternative Email, And department Letter.
- The output variables shall be: First Name, Last Name, Department Name, Email and Alternative Email.

Attributes	Processing variables/calculations	Operations	Necessary header/files/functions
-FirstName (String) -LastName (String) -email (String) -password(String) -department(String) -alternateEmail(String)	i++  date=year+"/"+month+"/"+day	+setDepartment(String) +generateEmail(String) +generateRandomPassword() (String) -generateRandomString (String) + setDateOfBirth(void) +setAlternateEmail(void) +getAlternateEmail(String) +getEmail(String) +getPassword(String) +getDepartment(String) +getDateOfBirth(Date) +toString(String)	import java.util.* import java.text.* If else statements System.out.println() next() next().charAt(0) nextInt() for loop EmailList[] while loop for enhanced loop

## UML Diagram:



## Flowchart:



**Code:**

```
import java.util.*; // to take input           //Start of Class Email
import java.text.*;
public class Email
{
    //Used in generateRandomPassword()
    private static final Random random = new Random();
    private static final String CharLower = "abcdefghijklmnopqrstuvwxyz";
    private static final String CharUpper = CharLower.toUpperCase();
    private static final String Numbers = "0123456789";
    private static final String SYMBOLS = "@$#";

    /*Attributes*/
    private String FirstName, LastName, email, password, department , alternateEmail ;
    private Date dateOfBirth ;
    // Used take the user department
    char choice;

    /*Constructor*/
    public Email(String FName, String LName){
        FirstName = FName;
        LastName = LName;
        setDateOfBirth();
        setAlternateEmail();
        setDepartment();
        password = generateRandomPassword();
        email = generateEmail();
    }

    /*Methods*/
    public String setDepartment(){ //To ask the user about which department
        while(choice != 'a' && choice != 'c' && choice != 'i' && choice != 'm'){
            System.out.println("Choose your department : ");

            System.out.println("a. Applied Linguistic\nc. Computer Science and
Engineering\ni. Interior Design\nm. Management Science");

            Scanner sc = new Scanner(System.in);
```

```

        choice = sc.next().charAt(0);
        if (choice == 'a' || choice == 'A')
            return department = "Applied Linguistic";
        else if (choice == 'c' || choice == 'C')
            return department = "Computer Science and Engineering";
        else if (choice == 'i' || choice == 'I')
            return department = "Interior Design";
        else if (choice == 'm' || choice == 'M')
            return department = "Management Science" ;
        else
            System.out.println("Please enter valid choice.");

    } return department; }

    public String generateEmail(){ //create an email for the student based on the
department
        String dep="";
        if(department.equals("Applied Linguistic")) dep = "al";
        else if(department.equals("Computer Science and Engineering")) dep = "cse";
        else if(department.equals("Interior Design")) dep = "id";
        else if(department.equals("Management Science")) dep = "ms";
        return FirstName.toLowerCase() + "." + LastName.toLowerCase() + "@" + dep +
".yuc.com";
    }

    public String generateRandomPassword(){ //Create a random password
        int passLength = 12;
        StringBuilder pass = new StringBuilder(passLength);
        String lowerAlpha = generateRandomString(CharLower, 4);
        String upperAlpha = generateRandomString(CharUpper, 4);
        String numbers = generateRandomString(Numbers, 2);
        String symbols = generateRandomString(SYMBOLS, 2);

        pass.append(lowerAlpha).append(upperAlpha).append(numbers).append(symbols);
        List<String> result = Arrays.asList(pass.toString().split(""));
        Collections.shuffle(result);
        return String.join("", result);
    }

```

```

    }

    private static String generateRandomString(String input, int size) {
        StringBuilder result = new StringBuilder(size);
        for (int i = 0; i < size; i++) {
            int index = random.nextInt(input.length());
            result.append(input.charAt(index));
        }
        return result.toString();
    }

    public void setDateOfBirth() { // Take the user Date of birth
        Scanner s = new Scanner(System.in);
        System.out.println("Enter your Date of Birth:");
        System.out.print("Day:");
        int day = s.nextInt();
        System.out.print("Month:");
        int month = s.nextInt();
        System.out.print("Year:");
        int year = s.nextInt();
        String date = year+"/"+month+"/"+day;
        dateOfBirth = new Date(date);
        SimpleDateFormat simpleDateFormat = new SimpleDateFormat("yyyy-MM-dd");
        simpleDateFormat.format(dateOfBirth);
    }

    public void setAlternateEmail(){ // Take The user alternate email
        Scanner n = new Scanner(System.in);
        System.out.print("Enter alternate email: ");
        alternateEmail = n.next();
    }

    // get methods to all Attributes
    public String getAlternateEmail() {return alternateEmail ;}
    public String getEmail() {return email;}
    public String getPassword() {return password;}
    public String getDepartment () {return department ;}

```

```
public Date getDateOfBirth() {return dateOfBirth;}

//@@Override - To Display the Details//

public String toString() {

    return "\nFirst Name : "+firstName+"\nLast Name : "+lastName+"\nDepartment
Name : "+department+"\nEmail : "+email+"\nAlternate Email : "+alternateEmail ;

}

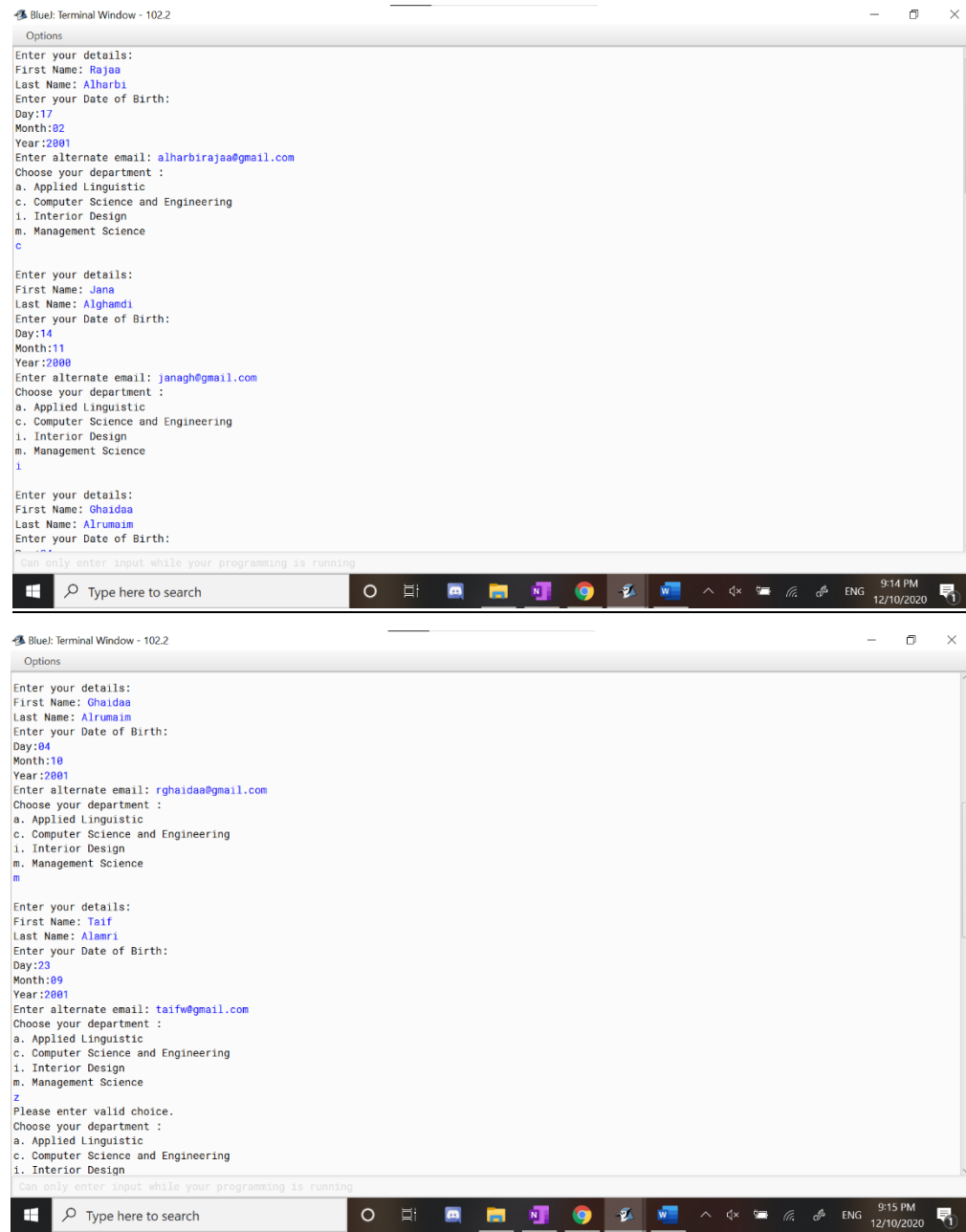
//End of Class Email
```

```
import java.util.*;
public class EmailApp
{
    public static void main(){
        Scanner n = new Scanner(System.in);
        Email[] emailList=new Email[5];

        for(int i=0; i<emailList.length; i++){
            System.out.println("Enter your details:");
            System.out.print("First Name: ");
            String First = n.next();
            System.out.print("Last Name: ");
            String Last = n.next();
            emailList[i] = new Email(First, Last);
            System.out.println();
        }
        System.out.print("-----Students Details-----");
        for(Email email : emailList){
            System.out.println(email.toString());
        }
    }
}
```

## Output (Compilation, Debugging & Testing)

❖ Testing with a **correct** input of department:



The image displays two screenshots of a Windows terminal window titled "Blue: Terminal Window - 102.2". The terminal shows the execution of a program that prompts for user details and department selection. The first screenshot shows three successful runs where the department 'c' (Computer Science and Engineering) is selected. The second screenshot shows three runs: the first two are successful with department 'm' (Management Science) and 'z' (Interior Design) respectively, while the third run shows an invalid choice 'z' followed by a prompt to enter a valid choice.

```
Options
Enter your details:
First Name: Rajaa
Last Name: Alharbi
Enter your Date of Birth:
Day:17
Month:02
Year:2001
Enter alternate email: alharbirajaa@gmail.com
Choose your department :
a. Applied Linguistic
c. Computer Science and Engineering
i. Interior Design
m. Management Science
c

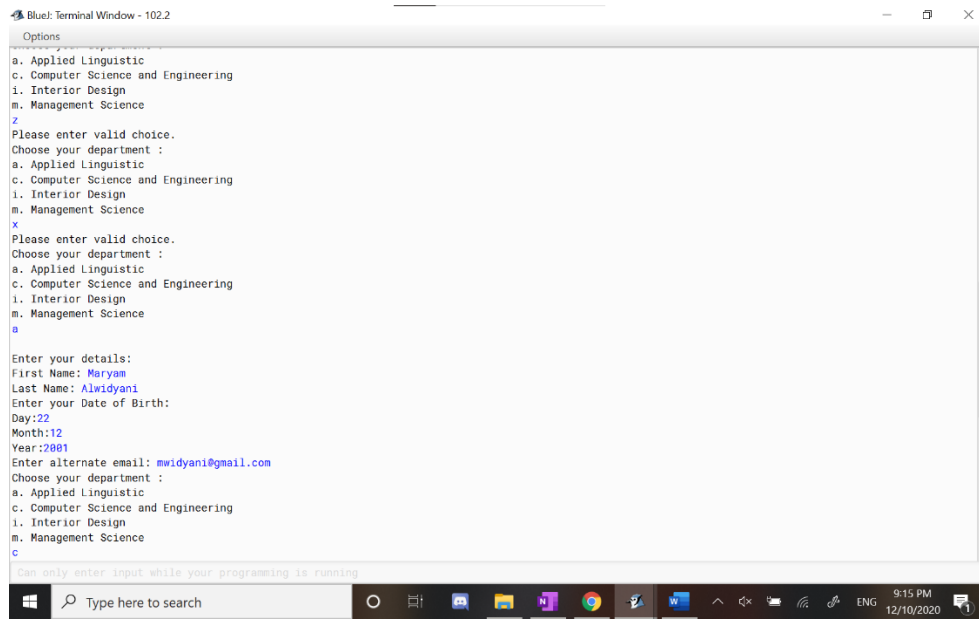
Enter your details:
First Name: Jana
Last Name: Alghandi
Enter your Date of Birth:
Day:14
Month:11
Year:2000
Enter alternate email: janagh@gmail.com
Choose your department :
a. Applied Linguistic
c. Computer Science and Engineering
i. Interior Design
m. Management Science
i

Enter your details:
First Name: Ghaidaa
Last Name: Alrumaim
Enter your Date of Birth:
Day:04
Month:10
Year:2001
Enter alternate email: rgaidaa@gmail.com
Choose your department :
a. Applied Linguistic
c. Computer Science and Engineering
i. Interior Design
m. Management Science
m

Enter your details:
First Name: Taif
Last Name: Alamri
Enter your Date of Birth:
Day:23
Month:09
Year:2001
Enter alternate email: taifw@gmail.com
Choose your department :
a. Applied Linguistic
c. Computer Science and Engineering
i. Interior Design
m. Management Science
z
Please enter valid choice.
Choose your department :
a. Applied Linguistic
c. Computer Science and Engineering
i. Interior Design
```

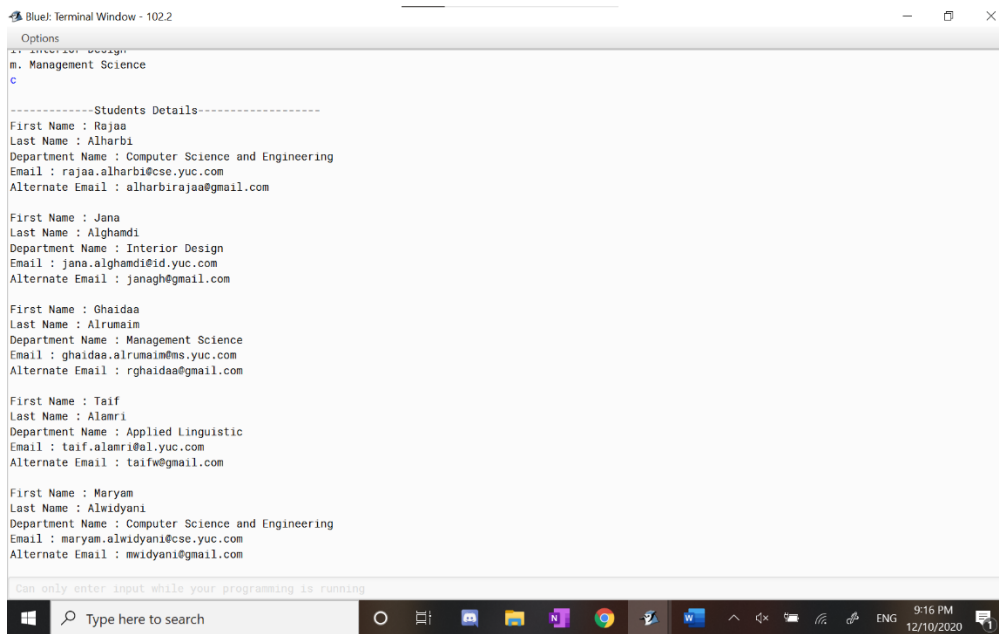
Can only enter input while your programming is running

### ❖ Testing with **Incorrect** input of department:



```
Blue: Terminal Window - 102.2
Options
a. Applied Linguistic
c. Computer Science and Engineering
i. Interior Design
m. Management Science
Z
Please enter valid choice.
Choose your department :
a. Applied Linguistic
c. Computer Science and Engineering
i. Interior Design
m. Management Science
X
Please enter valid choice.
Choose your department :
a. Applied Linguistic
c. Computer Science and Engineering
i. Interior Design
m. Management Science
a
Enter your details:
First Name: Maryam
Last Name: Alwidyani
Enter your Date of Birth:
Day:22
Month:12
Year:2001
Enter alternate email: mwidyani@gmail.com
Choose your department :
a. Applied Linguistic
c. Computer Science and Engineering
i. Interior Design
m. Management Science
c
Can only enter input while your programming is running
```

### ❖ The Output:



```
Blue: Terminal Window - 102.2
Options
m. Management Science
c
-----Students Details-----
First Name : Rajaa
Last Name : Alharbi
Department Name : Computer Science and Engineering
Email : rajaa.alharbi@cse.yuc.com
Alternate Email : alharbirajaa@gmail.com

First Name : Jana
Last Name : Alghamdi
Department Name : Interior Design
Email : jana.alghamdi@id.yuc.com
Alternate Email : janagh@gmail.com

First Name : Ghaidaa
Last Name : Alrumaim
Department Name : Management Science
Email : ghaidaa.alrumaim@ms.yuc.com
Alternate Email : rghaidaa@gmail.com

First Name : Taif
Last Name : Alamri
Department Name : Applied Linguistic
Email : taif.alamri@al.yuc.com
Alternate Email : taifw@gmail.com

First Name : Maryam
Last Name : Alwidyani
Department Name : Computer Science and Engineering
Email : maryam.alwidyani@cse.yuc.com
Alternate Email : mwidyani@gmail.com

Can only enter input while your programming is running
```

### Discussion and Conclusion:

This project focused on how we can use all the things we have learned in Object-Oriented Programming in this semester. And how we can solve a problem in a suitable way. Also, how to design proper output.