Week 6

Subject	Data Structure and Algorithm
Lecturer	Imam Fahrur Rozi ST. MT.
Type	Assignment
Semester	Semester 2
Time	@March 23, 2023
Files & Media	

Jobsheet 5

Question

1. at class `HighAchieverStudent/StudentList`
2. at class `HighAchieverStudent/StudentList`
3. swapping process is a process to swap the data that smaller than the data that we want to swipe

```
Students tmp = list [j];
list[j] = list[j-1];
list[j-1] = tmp;
```

4. it used to swap the data
5. answer
    a. loop i is used to iterate the array, while loop j is used to swap the data
    b. because we want to do check with i+1, so if we want to not overflowing the limit of array, we need to decrease the loop by 1 with that code

c. because if we want to check with j+i, we need to decrease it by 1 so it won't go through the limit of the array

d. there will be (50-49)/2 = 1225 iteration, it will have 49 times bubble sorting

6. used to swap the stored data with the larger data

7. code

```
void insertionSort(boolean asc)
    {
        for (int i = 0; i < list.length; i++)
        {
            Students temp = list[i];
            int j = i;

            if (asc)
            {
                while (j > 0 && list[j - 1].gpa > temp.gpa)
                {
                    list[j] = list[j - 1];
                    j--;
                }
            }
            else
            {
                while (j > 0 && list[j - 1].gpa < temp.gpa)
                {
                    list[j] = list[j - 1];
                    j--;
                }
            }
            list[j] = temp;
        }
    }
```

Assignment

1. code

```
package Assg;

public class Ticket
{
    String airlines, destination, origin;
    int price;

    Ticket(String a, String dest, String origin, int price)
```

```
    {
        airlines = a;
        destination = dest;
        this.origin = origin;
        this.price = price;
    }

    void print()
    {
        System.out.println("Airlines = " + airlines);
        System.out.println("Destination = " + destination);
        System.out.println("Origin = " + origin);
        System.out.println("Price = " + price);
    }
}
```

```
package Assg;

public class TicketService
{
    Ticket tickets[] = new Ticket[5];
    int index;

    void add(Ticket t)
    {
        if (index < tickets.length)
        {
            tickets[index] = t;
            index++;
        }
        else
        {
            System.out.println("The ticket list is full-filled");
        }
    }

    void displayAll()
    {
       for (Ticket t: tickets)
       {
           t.print();
           System.out.println("====================");
       }
    }

    void bubbleSort()
    {
        for (int i = 0; i< tickets.length-1; i++)
        {
            for (int j = 1; j < tickets.length-i; j++)
            {
```

```
                if (tickets[j].price > tickets[j-1].price)
                {
                    Ticket temp = tickets[j];
                    tickets[j] = tickets[j-1];
                    tickets[j-1] = temp;
                }
            }
        }
    }

    void selectionSort()
    {
        for (int i = 0; i < tickets.length-1; i++)
        {
            int indexMin = i;
            for (int j = i+1; j < tickets.length; j++)
            {
                if (tickets[j].price < tickets[indexMin].price)
                {
                    indexMin = j;
                }
            }
            Ticket temp = tickets[indexMin];
            tickets[indexMin] = tickets[i];
            tickets[i] = temp;
        }
    }
}
```

```
package Assg;
import java.util.Scanner;

public class MainTicket
{
    public static void main(String[] args)
    {
        Scanner s1 = new Scanner(System.in);
        Scanner s2 = new Scanner(System.in);
        TicketService data = new TicketService();
        int n = 5;

        for(int i = 0; i < n; i++)
        {
            System.out.println("====================");
            System.out.print("Airlines = ");
            String air = s2.nextLine();
            System.out.print("Destination = ");
            String des = s2.nextLine();
            System.out.print("Origin = ");
            String ori = s2.nextLine();
            System.out.print("Price = ");
```

```
            int prc = s1.nextInt();

            Ticket t = new Ticket(air, des, ori, prc);
            data.add(t);
        }

        System.out.println("====================");
        System.out.println("Unsorted ticket list: ");
        System.out.println("====================");
        data.displayAll();

        System.out.println("Sorted price ascending list");
        System.out.println("====================");
        data.selectionSort();
        data.displayAll();

        System.out.println("Sorted price descending list");
        System.out.println("====================");
        data.bubbleSort();
        data.displayAll();
    }
}
```

```
====================
Airlines = hewwo
Destination = ohio
Origin = malang
Price = 1500000
====================
Airlines = singwat
Destination = florida
Origin = bandung
Price = 2000000
====================
Airlines = l4d2
Destination = amimirica
Origin = jakarta
Price = 1750000
====================
Airlines = buglorant
Destination = turip ip ip
Origin = yogya
Price = 750000
====================
Airlines = bensin impacc
Destination = singahow
Origin = malang
Price = 500000
====================
```

```
====================
Unsorted ticket list:
====================
Airlines = hewwo
Destination = ohio
Origin = malang
Price = 1500000
====================
Airlines = singwat
Destination = florida
Origin = bandung
Price = 2000000
====================
Airlines = l4d2
Destination = amimirica
Origin = jakarta
Price = 1750000
====================
Airlines = buglorant
Destination = turip ip ip
Origin = yogya
Price = 750000
====================
Airlines = bensin impacc
Destination = singahow
Origin = malang
Price = 500000
====================
```

```
====================
Sorted price ascending list
====================
Airlines = bensin impacc
Destination = singahow
Origin = malang
Price = 500000
====================
Airlines = buglorant
Destination = turip ip ip
Origin = yogya
Price = 750000
====================
Airlines = hewwo
Destination = ohio
Origin = malang
Price = 1500000
====================
Airlines = l4d2
Destination = amimirica
Origin = jakarta
Price = 1750000
====================
Airlines = singwat
Destination = florida
Origin = bandung
Price = 2000000
====================
```

```
====================
Sorted price descending list
====================
Airlines = singwat
Destination = florida
Origin = bandung
Price = 2000000
====================
Airlines = l4d2
Destination = amimirica
Origin = jakarta
Price = 1750000
====================
Airlines = hewwo
Destination = ohio
Origin = malang
Price = 1500000
====================
Airlines = buglorant
Destination = turip ip ip
Origin = yogya
Price = 750000
====================
Airlines = bensin impacc
Destination = singahow
Origin = malang
Price = 500000
====================
```

2. code

```
package Assg;

public class PremierLeague
{
    String team;
    int play, goal, points;

    PremierLeague(String t, int p, int g, int pt)
    {
        team = t;
```

```
        play = p;
        goal = g;
        points = pt;
    }

    void print()
    {
        System.out.println("Team = " + team);
        System.out.println("Play = " + play);
        System.out.println("Goal = " + goal);
        System.out.println("Points = " + points);
    }
}
```

```
package Assg;

import Prac.Students;

public class PremierLeagueService
{
    PremierLeague league[] = new PremierLeague[5];
    int index;

    void add(PremierLeague p)
    {
        if (index < league.length)
        {
            league[index] = p;
            index++;
        }
        else
        {
            System.out.println("The league list is full-filled");
        }
    }

    void displayAll()
    {
        for (PremierLeague p: league)
        {
            p.print();
            System.out.println("====================");
        }
    }

    void insertionSort()
    {
        for (int i = 0; i < league.length; i++)
        {
            PremierLeague temp = league[i];
            int j = i;
```

```
            while (j > 0 && league[j - 1].points < temp.points)
            {
                league[j] = league[j - 1];
                j--;
            }
            league[j] = temp;
        }
    }
}
```

```
package Assg;

import java.util.Scanner;

public class MainLeague
{
    public static void main(String[] args)
    {
        Scanner s1 = new Scanner(System.in);
        Scanner s2 = new Scanner(System.in);
        PremierLeagueService data = new PremierLeagueService();
        int n = 5;

        for(int i = 0; i < n; i++)
        {
            System.out.println("====================");
            System.out.print("Team Name = ");
            String name = s2.nextLine();
            System.out.print("Play = ");
            int play = s1.nextInt();
            System.out.print("Goal = ");
            int goal = s1.nextInt();
            System.out.print("Points = ");
            int point = s1.nextInt();

            PremierLeague p = new PremierLeague(name, play, goal, point);
            data.add(p);
        }

        System.out.println("====================");
        System.out.println("Premiere League: ");
        System.out.println("====================");
        data.insertionSort();
        data.displayAll();
    }
}
```

```
====================
Team Name = Manchester City
Play = 27
Goal = 39
Points = 57
====================
Team Name = Aston Villa
Play = 27
Goal = -18
Points = 25
====================
Team Name = Leicester
Play = 28
Goal = 26
Points = 50
====================
Team Name = Norwich City
Play = 29
Goal = -27
Points = 21
====================
Team Name = Liverpool
Play = 29
Goal = 45
Points = 82
====================
```

```
====================
Premiere League:
====================
Team = Liverpool
Play = 29
Goal = 45
Points = 82
====================
Team = Manchester City
Play = 27
Goal = 39
Points = 57
====================
Team = Leicester
Play = 28
Goal = 26
Points = 50
====================
Team = Aston Villa
Play = 27
Goal = -18
Points = 25
====================
Team = Norwich City
Play = 29
Goal = -27
Points = 21
====================
```