**JOBSHEET 10**

**Array 2**



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**Class**

1I

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Information Technology

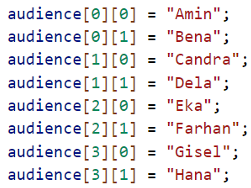
**Study Program**

D4 Informatics Engineering

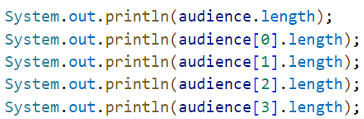
Labs Activity

**Question! (Experiment 1)**

1. Do array elements have to be filled in sequentially starting from the 0th index? Please explain!
2. Why is there a null in the list of audience names?
3. Complete the audience list in step 4 so that it looks like the following program code

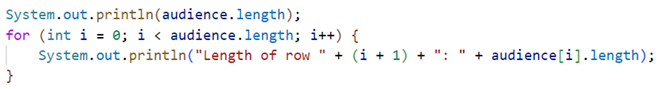


1. Add the following program code:

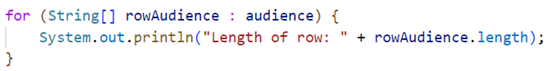


Explain the function of audience.length and audience[0].length! Do audience[0].length, audience[1].length, audience[2].length, and audience[3].length have the same value? Why?

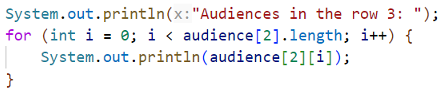
1. Modify the program code in step 4 to display the length of each row in the array using a for loop. Compile, run, then commit.



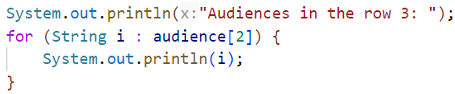
1. Modify the program code in step 5 to display the length of each row in the array using a foreach loop. Compile, run, then commit.



1. In your opinion, what are the advantages and disadvantages of foreach loop compared to for loop?
2. What is the max row index for the audience array?
3. What is the max column index for the audience array?
4. Add program code to display the audience’s name on the 3rd line using a for loop. Compile, run, then commit.



1. Modify the code in question number 10 to repeat using a foreach loop. Compile, run, then commit.

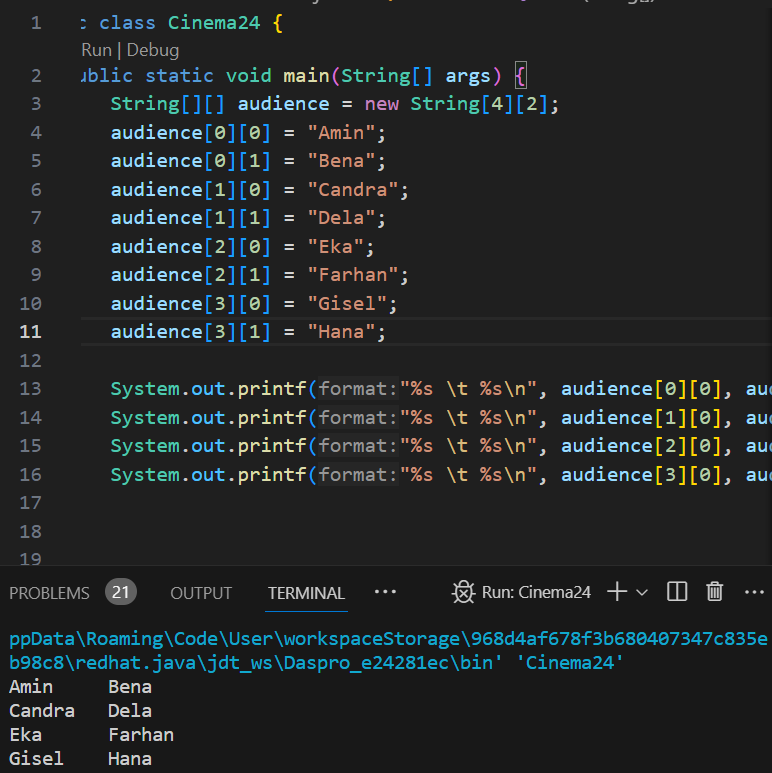
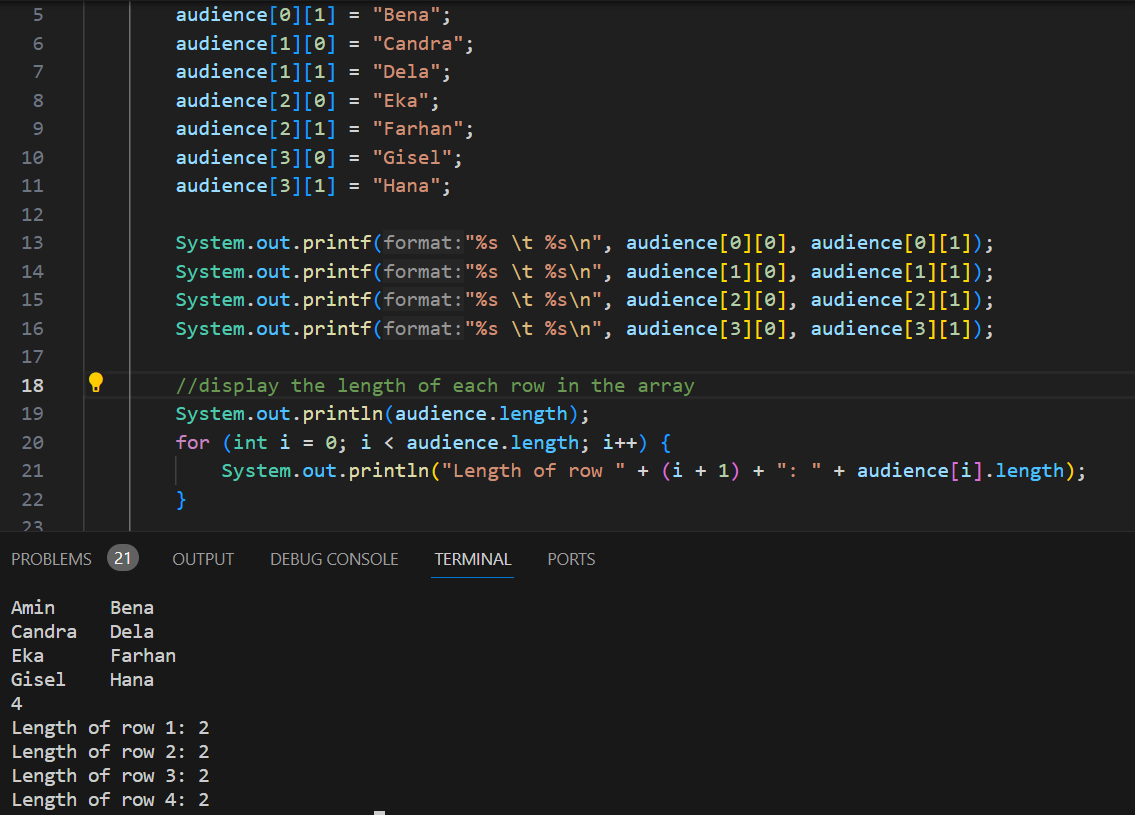
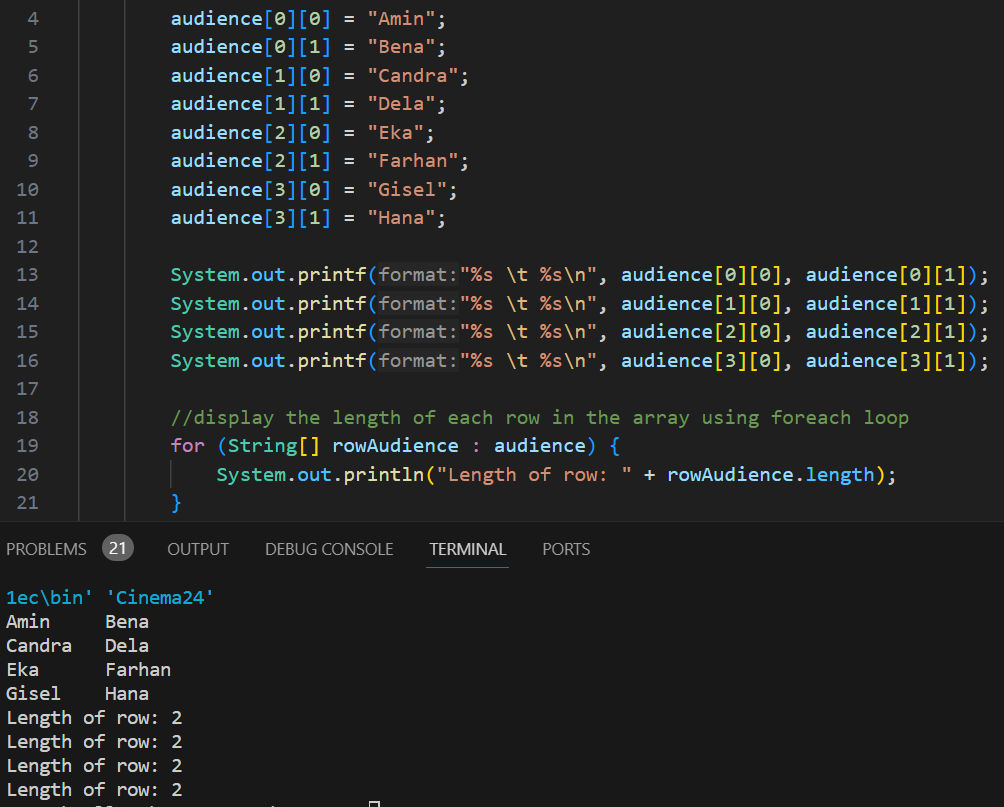


1. Modify the program code in question number 11 again to display the audience’s name for each line. Compile and run the program then observe the results, then commit.



1. What is the function of String.join()?
2. Commit and push to GitHub

**Answer!**

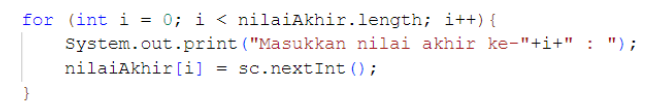
1. No, array elements do not have to be filled in sequentially starting from the 0th index. In Java, as in many programming languages, arrays are zero-indexed, meaning the first element is at index 0. You can assign values to array elements in any order.
2. Because not all the elements of the array have been initialized with values.
3. 
4. audience.length gives the number of rows in the audience array, and audience[i].length gives the number of columns in the i-th row of the array. audience.length will output the number of rows in the audience array. In this case, it will be 4 because we've created a 4x2 array. Whereas, audience[0].length, audience[1].length, audience[2].length, and audience[3].length all have the same value (2) because we've defined the array to have 2 columns for each row.
5. 
6. 
7. Advantages: 1. The foreach loop is more concise and can enhance the readability of the code, 2. No need to manage indices explicitly, reducing the chance of off-by-one errors or other index-related mistakes, 3. Less likely to encounter ArrayIndexOutOfBoundsException errors because not directly accessing elements using indices.

Disadvantages: 1. The foreach loop doesn't provide direct access to the index of the current element, which can be a limitation in certain scenarios where we need the index, 2. we cannot modify the elements of the collection or array being iterated over while using a foreach loop. This can be a limitation if we need to update elements during iteration.

1. The maximum row index for the audience array is 3, because it has 4 rows (dimension 4x2), so the valid row indices are 0, 1, 2, and 3.
2. The maximum column index for the audience array is 1, because the each row has 2 columns (dimension 4x2), so the valid column indices are 0 and 1.

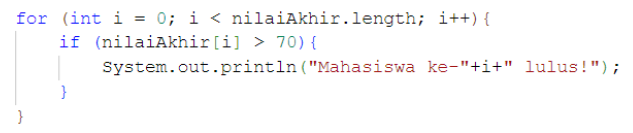
**Question! (Experiment 2)**

1. Ubah statement pada langkah nomor 5 menjadi seperti berikut ini:



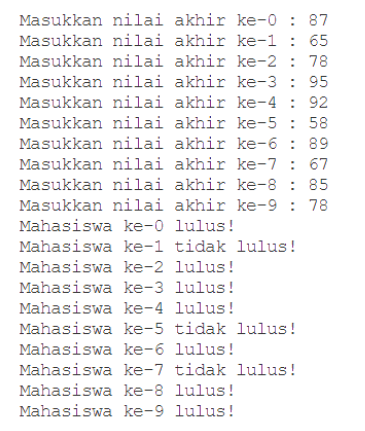
Jalankan program. Apakah terjadi perubahan? Mengapa demikian?

1. Apa yang dimaksud dengan kondisi: ?
2. Ubah statement pada langkah nomor 6 menjadi seperti berikut ini, sehingga program hanya menampilkan nilai Mahasiswa yang lulus saja (yaitu mahasiswa yang memiliki nilai > 70):



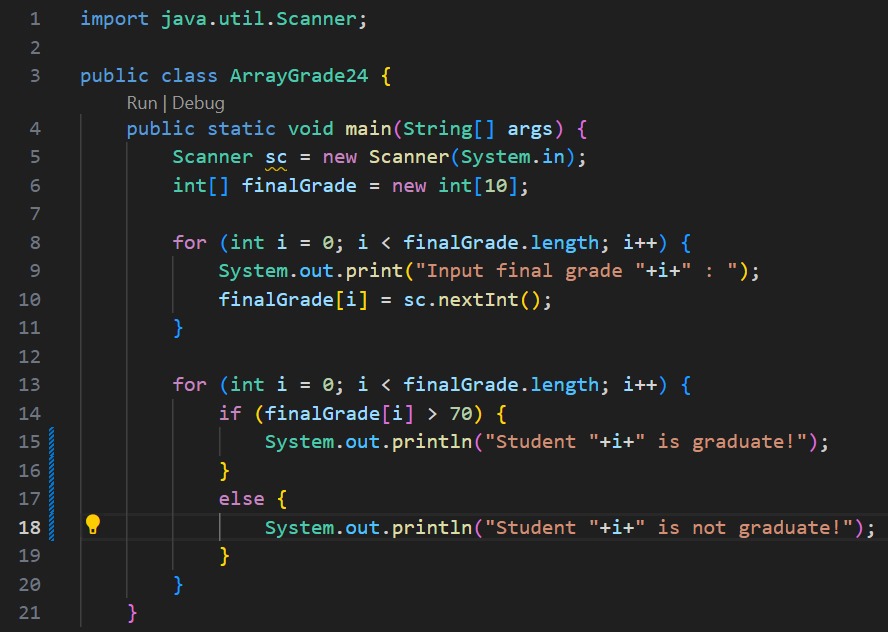
Jalankan program dan jelaskan alur program!

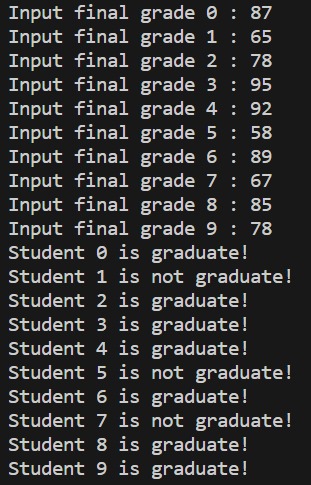
1. Modifikasi program agar menampilkan status kelulusan semua mahasiswa berdasarkan nilai, yaitu dengan menampilkan status mana mahasiswa yang lulus dan tidak lulus, seperti ilustrasi output berikut:



1. Push dan commit kode program ke github.

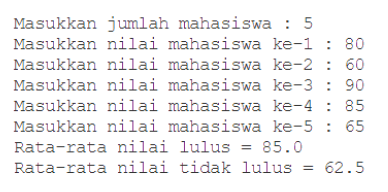
**Answer!**

1. Tidak terjadi perubahan output, karena perintah nilaiakhir.length memiliki arti yang sama dengan perintah sebelumnya.
2. Digunakan untuk menguji apakah nilai dari variabel i kurang dari panjang (jumlah elemen) dari array nilaiAkhir.
3. Program hanya menampilkan mahasiswa yang lulus yang memiliki nilai >70.
4. 



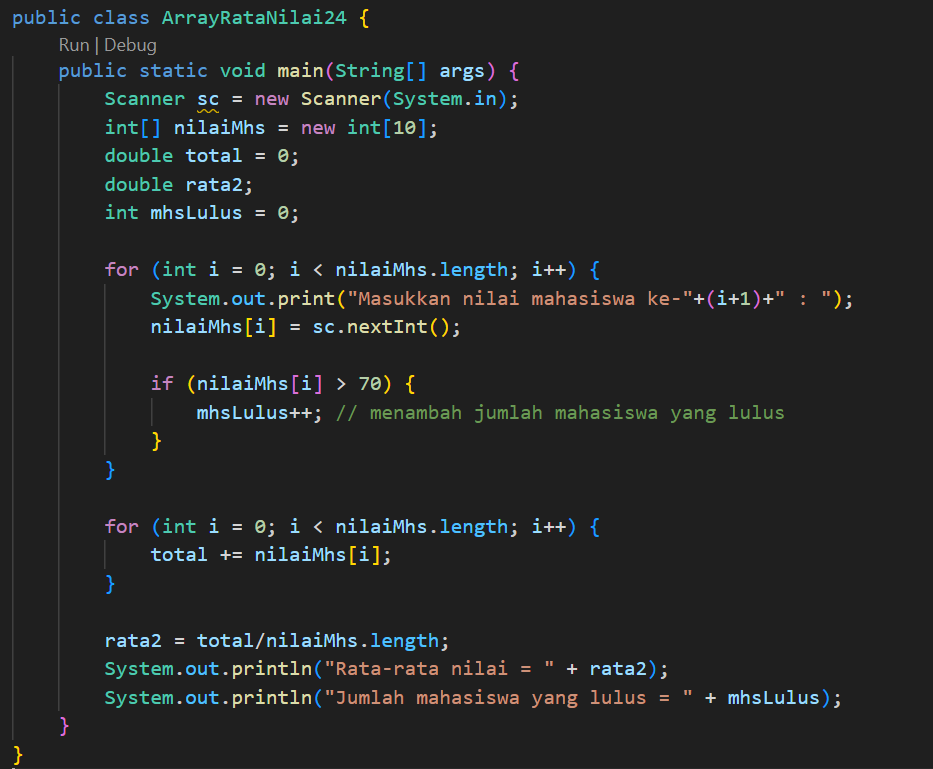
**Question! (Experiment 3)**

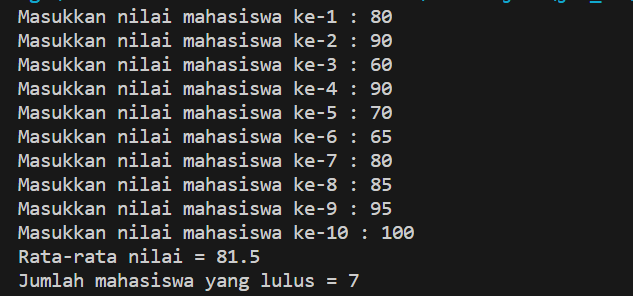
1. Modifikasi kode program pada praktikum percobaan 3 di atas (ArrayRataNilaiXXXX.java) agar program dapat menampilkan banyaknya mahasiswa yang lulus, yaitu mahasiswa yang memiliki lebih besar dari 70 (>70).
2. Modifikasi program pada praktikum percobaan 3 di atas (ArrayRataNilaiXXXX.java) sehingga program menerima jumlah elemen berdasarkan input dari pengguna dan mengeluarkan output seperti berikut ini:



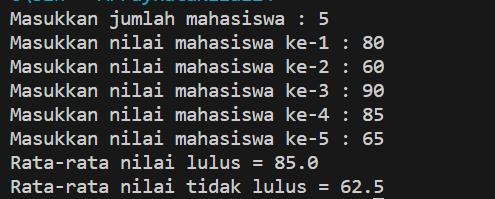
1. Push dan commit kode program ke github.

**Answer!**

1. 



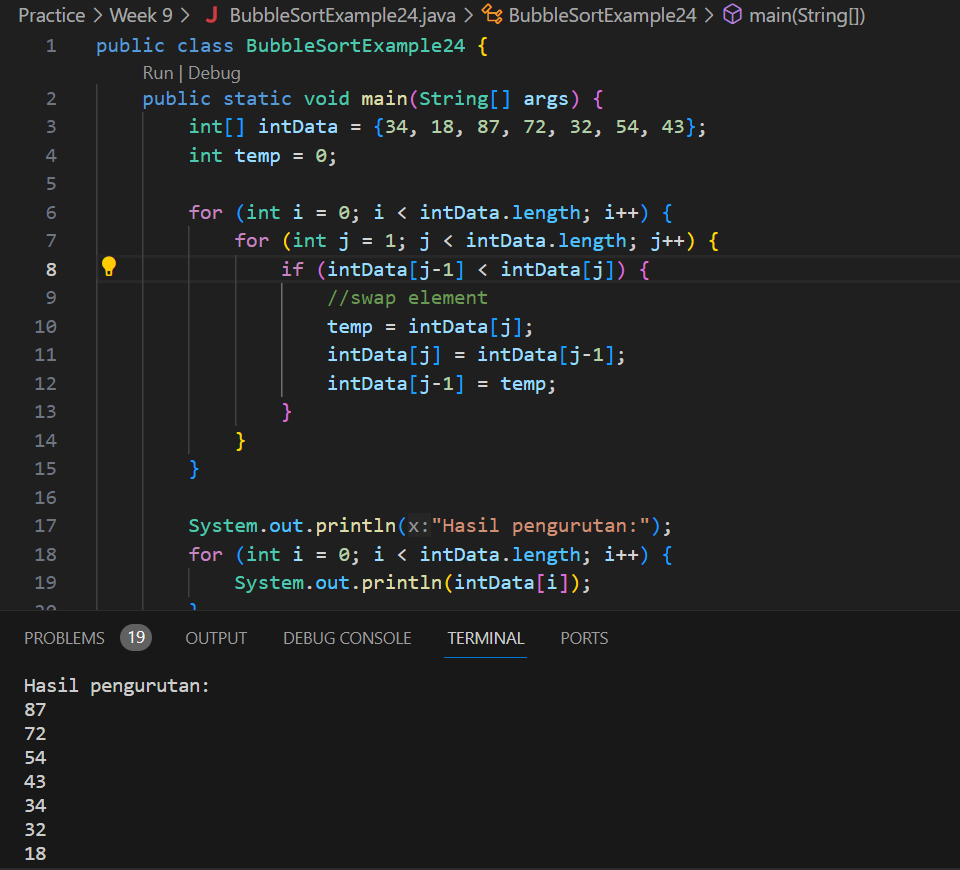
1. 



**Question! (Experiment 4)**

1. Modifikasi program pada percobaan 4 di atas, sehingga urutannya mengecil (*descending*).
2. Push dan commit kode program ke github.

**Answer!**

1. 

**Assignment**

**Times: 150 minutes**

1. Buat program untuk menghasilkan nilai tertinggi, nilai terendah, dan rata-rata dari suatu array berisi bilangan bertipe integer.

Ketentuan:

* Input: Banyaknya elemen, nilai tiap elemen
* Output: Nilai tertinggi, nilai terendah, nilai rata-rata

1. Implementasikan *flowchart* yang telah dibuat pada tugas pertemuan 9 mata kuliah Dasar Pemrograman terkait project kelompok ke dalam kode program Java.

**Answer**

1. 