

C++ OOP Retake Exam – 27 April 2024

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3. Conference Participants

You have a conference participant management system, which uses the following classes to do its job:

Participant	The base class of all participants.
— Organizer	Base class for all organizers
— OrganizerEmployee	Employee of the organizer
— OrganizerManager	Manager of the organizer
— Visitor	Base class for all visitors
— AdultVisitor	Adult (above 18 years' old) participant
— MinorVisitor	Minor (below 18 years' old) participant
— Sponsor	Base class for an employee of a sponsor
— BronzeEmployee	Employee from a bronze sponsor
— SilverEmployee	Employee from a silver sponsor
— GoldEmployee	Employee from a gold sponsor

The system reads participant data, depending on each participant type, then builds the hierarchy of participants. For each different class we've got the different input and output. The base classes do not have input, as they cannot exist in the hierarchy.

The input data is classified in the following way for each separate class:

- Each participant data starts with the Type as follows: **OE**, **OM**, **AV**, **MV**, **SE** and **GE** (see below for identification which **Type** to which class refers)
- The **Id** of the participant, an `int`;
- The rest of the fields are only alphanumeric, e.g. cannot contain digits, spaces, or punctuation.
 - The only exception is the **Age** field of the **MinorVisitor**, which is an `int` like the **Id**.
- It's guaranteed that the **Name + Surname** pairs are unique
- It's guaranteed that each **MinorVisitor** participant will have a corresponding accompanying adult (e.g., there will be an adult with that pair of names)
 - There's no such guarantee for the **Employee <-> Manager** connection, and it does not matter from this application's perspective.
- The data will be correct both syntactically and semantically.
- The input ends with **end**.

Here's the input format of each class:

Participant	<i>Does not have specific input</i>
— Organizer	<i>Does not have specific input</i>
— OrganizerEmployee	OE Id Name Surname ManagerName ManagerSurname Example:

	OE 2 Ivan Popov Stefan Petrov
└ OrganizerManager	OM Id Name Surname Department Example: OM 4 Stefan Petrov Sales
└ Visitor	<i>Does not have specific input</i>
└ AdultVisitor	AV Id Name Surname accountId Example: AV 6 Doncho Angelov donangel
└ MinorVisitor	MV Id Name Surname AdultName AdultSurname Age Example: MV 8 Kalina Angelova Doncho Angelov 11
└ Sponsor	<i>Does not have specific input</i>
└ SilverEmployee	SE Id Name Surname Company accountId Example: SE 10 Stilyan Petrov CompanA stipe
└ GoldEmployee	GE Id Name Surname Company TshirtSize Example: GE 11 Marko Markov markma XXXL

The system will read and classify each input line, and then will print out a participation summary and a list of all participants by type. See the Example section for details.

Your task is to study the class hierarchy and complete it, and then provide the needed operators, so that the output is successful. Your ZIP file should contain the following files: **Solution.h**, **SilverEmployee.h**, and **Sponsor.h**.

Example 1

Input
OM 1 Ivan Tenev Sales OE 2 Stanoika Ivanova Ivan Tenev AV 23 Petar Petrov pepet AV 21 Ivan Georgiev ivge GE 8 Golden Aishe Fatctory XXXL end
Output
Participants: 5, Organizers: 2, Sponsors: 1, Visitors: 2 Organizers: - Tenev, Ivan Sales manager - Ivanova, Stanoika manager: Tenev, Ivan Visitors: - Petrov, Petar pepet - Georgiev, Ivan ivge Sponsors: - Gold: Aishe, Golden Fatctory XXXL

Example 2

Input

```
SE 10 Stilyan Petrov CompanA stipe
GE 11 Marko Markov markma XXXL
MV 8 Kalina Angelova Doncho Angelov 11
AV 6 Doncho Angelov donangel
OM 4 Stefan Petrov Sales
OE 2 Ivan Popov Stefan Petrov
end
```

Output

Participants: 6, Organizers: 2, Sponsors: 2, Visitors: 2

Organizers:

- Petrov, Stefan | Sales
- Popov, Ivan | manager: Petrov, Stefan

Visitors:

- Minor: Angelova, Kalina | 11 | accompanied by: Angelov, Doncho
- Angelov, Doncho | donangel

Sponsors:

- Silver: Petrov, Stilyan | CompanA | stipe
- Gold: Markov, Marko | markma | XXXL

Example 3

Input

```
AV 6 Doncho Angelov donangel
OM 4 Stefan Petrov Sales
end
```

Output

Participants: 2, Organizers: 1, Sponsors: 0, Visitors: 1

Organizers:

- Petrov, Stefan | Sales

Visitors:

- Angelov, Doncho | donangel

Sponsors:

- none