# Problem 4 – Hospital

Your task will be to prepare electronic register for hospital. In the hospital we have different departments:

* Cardiology
* [Oncology](https://en.wikipedia.org/wiki/Oncology)
* [Emergency department](https://en.wikipedia.org/wiki/Emergency_department)
* etc.

Each department have 20 rooms for patients and each room have 3 beds. When new patient go in hospital, he/she is placed on first free bed in department. If there is not free beds, the patient should go in another hospital. Of course in every hospitals have doctors. Each doctor can have patients in different department. You will receive information about patients **{Department} {Doctor} {Patient}**

After "Output" command you will receive some other commands what kind of output you need to print. Commands are:

* **{Department}** – You need to print all patients in this department in order of receiving
* **{Department} {Room}** – You need to print all patients in this room in alphabetical order
* **{Doctor}** – you need to print all patients from every department in alphabetical order

Everything finish when you receive command "END".

### Input

On first lines you will receive info for hospital, department, doctors and patients in format:

**{Department} {Doctor} {Patient}**

When you read "Output" line you will get one or more commands for what you need to print

Read commands for printing, till you read "End"

### Output

* **{Department}** – print all patients in this department in order of receiving on new line
* **{Department} {Room}** – print all patients in this room in alphabetical order each on new line
* **{Doctor}** – print all patients from every department in alphabetical order on new line

### Constraints

* **{Department}** – single word with length **1 < n < 100**
* **{Doctor}** – name and surname, both with length **1 < n < 20**
* **{Patient}** – unique name with length **1 < n < 20**
* Time limit: 0.3 sec. Memory limit: 16 MB.

### Examples

|  |  |
| --- | --- |
| **Input** | **Output** |
| Cardiology Petar Petrov Ventsi  Oncology Ivaylo Kenov Valio  Emergency Mariq Mircheva Simo  Cardiology Genka Shikerova Simon  Emergency Ivaylo Kenov NuPogodi  Cardiology Gosho Goshov Esmeralda  Oncology Gosho Goshov Cleopatra  Output  Cardiology  End | Ventsi  Simon  Esmeralda |

|  |  |
| --- | --- |
| **Input** | **Output** |
| Cardiology Petar Petrov Ventsi  Oncology Ivaylo Kenov Valio  Emergency Mariq Mircheva Simo  Cardiology Genka Shikerova Simon  Emergency Ivaylo Kenov NuPogodi  Cardiology Gosho Goshov Esmeralda  Oncology Gosho Goshov Cleopatra  Output  Cardiology 1  End | Esmeralda  Simon  Ventsi |

|  |  |
| --- | --- |
| **Input** | **Output** |
| Cardiology Petar Petrov Ventsi  Oncology Ivaylo Kenov Valio  Emergency Mariq Mircheva Simo  Cardiology Genka Shikerova Simon  Emergency Ivaylo Kenov NuPogodi  Cardiology Gosho Goshov Esmeralda  Oncology Gosho Goshov Cleopatra  Output  Ivaylo Kenov  End | NuPogodi  Valio |