# Exercise 7

## Task 1: Core Concepts

1. **Write down the core parts of a case.**

A case in case-based reasoning consists of a description of a problem in the past with the solution to the problem.

1. **Write down the names of the 4R process steps. Describe in your own words each process step.**

* Retrieve: This process is the step where you retrieve the problem that is the most similar to the current problem at hand. This can be done by comparing the problem description with the other case descriptions.
* Reuse: This part is where you reuse the solution from one of the retrieved cases to solve the current problem.
* Revise: This is where you modify/revise the retrieved case solution in case the current problem requires a different solution approach.
* Retain: This where the current problem is retained/saved as a new case with its problem description and the solution that worked for it.

## Task 2: Details of a CBR System

1. **Think about an application in which CBR can be applied. Write down the task of the system**

Medical diagnosis. For helping diagnose patients

1. **Write down a case representation for your example.**

|  |  |
| --- | --- |
| Attribute | Value |
| Symptom | Fever, cough, fatigue etc |
| Age | 20, 30 etc |
| Body temperature | 38.9 etc |
| Duration of illness | 2 days etc |
| Solution | |
| Diagnosis | Influenza |
| Treatment | Medication, rest etc |

1. **Pick at least one attribute and define a similarity function**

For the attribute body temperature

The same temperatures would result in a similarity score of 1 and goes towards 0 as the similarity decreases.

## Task 3: Knowledge Representation

**Draw a table that shows the relationship between the 4R cycle and the knowledge containers.**

|  |  |  |
| --- | --- | --- |
| **Knowledge containers** | **4R cycle** | **Reason** |
| Vocabulary | Reuse | Previous solutions and previous adaptations can be reused to solve new problems |
| Similarity measure | Retrieve | The retrieval of similar cases is based upon the use of similarity functions to compute the distance or similarity of two cases |
| Adaptation knowledge | Revise | Adaptation knowledge is used to revise earlier solutions that require some revision |
| Case base | Retain | The systems experience is stored as cases within  the case base which can be seen as a special  form of a data base |