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17/sci02/051

1. **Computability** is about what can be computed while **Complexity** is about how efficiently can it be computed.

Put succinctly, **computability** theory is concerned with what can be computed versus what cannot; **complexity** is concerned with **the** resources required to compute **the** things that are **computable**.

2a. Examples of complexity theory includes the aforementioned concepts of proofs and representation as well as concepts like randomness, knowledge, interaction, secrecy and

learning.
2b. **Example of computability theory is**, one can impose limitations on the size of the alphabet, or one can insist that the machine never move to the left of its initial starting point.

3.. A **set** is a group or collection of objects or numbers, considered as an entity unto itself.
Examples include the **set** of all computers in the world, the **set** of all apples on a tree, and the **set** of all irrational numbers between 0 and 1.
ii.The **power set** (or **powerset**) of any set *S* is the set of all subsets of *S*, including the empty set and

S itself,
iii.Member of a set is usually the subset of a set.

Iv. Subset: A **set** A is a **subset of a set** B if every element of A is also an element of B. Notation: A ⊆ B is read, "**Set** A is a **subset** of **set** B." Example: In the paragraph above, the **set** of members of the U.S. Senate's Judiciary Committee is a **subset** of the **set** of members of the U.S. Senate.

V.A **proper subset** of a set A is a **subset** of A that is not equal to A. In other words, if B is a **proper subset** of A, then all elements of B are in A but A contains at least one element that is not in B. For example, if A={1,3,5} then B={1,5} is a **proper subset**

of A.
Vi.An infinite set is a set that is not a finite set. Infinite sets may be countable or uncountable.
Vii.**Examples** of **infinite set**:
Set of all points in a line segment is an **infinite set**.
3. **Set** of all positive integers which is multiple of 3 is an **infinite set**. ... i.e. **set** of all natural numbers is an **infinite set**.
Viii.an **unordered pair** or **pair** set is a set of the form {a, b}, i.e. a set having two elements a and b with no particular relation between them. In contrast, an ordered **pair** (a, b) has a as its first element and b as its second element.
Ix.A finite set is a set that

has a finite number of elements. Informally, a finite set is a set which one could in principle count and finish counting. For example, is a finite set with five elements. The number of elements of a finite set is a natural number and is called the cardinality of the set.

X. The **intersection** of two **sets** A and B, denoted by A ∩ B, is the **set** containing all elements of A that also belong to B (or equivalently, all elements of B that also belong to A).

Xi. **Complement of a Set**: The **complement of a set**, denoted A', is the **set** of all elements in the given universal **set** U that are not in A. ... **Example**: U' = ∅ The **complement** of the universe is the empty **set**. **Example**: Ø' = U The **complement** of an empty **set** is the universal **set**.

Xii. The **difference** of two **sets**, written A - B is the **set** of all elements of A that are not elements of B. The **difference** operation, along with union and intersection, is an important and fundamental **set** theory operation

Xiii.The **symmetric difference**, also known as the disjunctive union, of two **sets** is the **set** of elements which are in either of the **sets** and not in their intersection. The **symmetric difference** of the **sets** A and B is commonly denoted by. or.

4.

5.

A. In formal languages, alphabet is the set of all symbols used to form words in our language.

B.