Semantic Web is an extension to the World Wide Web. The purpose of the semantic web is to provide structure to the web and data in general. It emphasizes on representing a web of data instead of web of documents. It allows computers to intelligently search, combine and process the web content based on the meaning that the content has. Three main models of the semantic web are:

1. Building models
2. Computing with Knowledge
3. Exchanging Information

* **Building Models:**  
  Model is a simplified version or description of certain aspects of the real-time entities. Model gathers information which is useful for the understanding of the particular domain.
* **Computing Knowledge:**  
  Conclusions can be obtained from the knowledge present.  
  **Example:** If two sentences are given as *‘John is the son of Harry’* and another sentence given is- *‘Hary’s father is Joey’*, then the knowledge that can be computed from it is – *‘John is the grandson of Joey’*  
  Similarly, another example useful in the understanding of computing knowledge is-  
  *‘All A is B’* and *‘All B is C’*, then the conclusion that can be drawn from it is – *‘All A are C’* respectively.
* **Exchanging Information:**  
  It is an important aspect. Various communication protocols have been implemented for the exchange of information like the TCP/IP, HTML, WWW. Web Services have also been used for the exchange of the data.

**The technologies associated with the semantic web are:**

* RDF (Resource Description Framework)
* OWL (Web Ontology Language)
* DL (Description Language)

**The query language used is:**

* SPARQL ( SPARQL Protocol and RDF query language).
* SHACL (Shape Constraint Language). SHACL is used for validating the RDF graphs against a set of conditions.

**RDF:**  
It is the formal language for describing structured information. The primary goal of RDF is to exchange data on the web while preserving the original meaning of the data. It is a data model that is used to describe resources.  
For Example Physical Things, Abstract Concepts, Numbers and Strings.  
RDF allows the processing of information. RDF representation can be in the form of triples and graphs. RDF graph is a directed graph which is used to serve as a description language for data on the world wide web and other electronic networks.  
Resources are described using triples.  
Triples capture the relationship between the subject and the object. Triples have a subject, predicate and an object. Triples are enclosed within angular brackets.

**Example:** Delhi is capital of India  
The triple generated from this sentence is:

|  |
| --- |
| <Delhi> <capital of> <India>. |

, where Delhi is the subject, capital of is the predicate and India is the object.  
The triples can also be represented in the form of URIs (Uniform Resource Identifier).  
**Example of URI triple:**

|  |
| --- |
| <http://www.abc.org/subject/Delhi>  <http://www.abc.org/predicate/capitalOf>  <http://www.abc.org/object/India>. |

Every statement is terminated by a full-stop in RDF triple.





