Geographic information Systems

Assignment No. 1

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Q1) List of all the Satellites launched in earths orbit by ISRO with the main purpose of observing the earth from above.

Ans-

Name	Launch Date	Launch Mass	Launch Vehicle	Orbit Type	Application
RISAT-2BR1	Dec 11, 2019	628 Kg	PSLV-C48/RISAT-2BR1	LEO	Disaster Management System, Earth Observation
Cartosat-3	Nov 27, 2019		PSLV-C47 / Cartosat-3 Mission	SSPO	Earth Observation
RISAT-2B	May 22, 2019	615 Kg	PSLV-C46 Mission	SSPO	Disaster Management System, Earth Observation
HysIS	Nov 29, 2018		PSLV-C43 / HysIS Mission	SSPO	Earth Observation
Cartosat-2 Series Satellite	Jan 12, 2018	710 Kg	PSLV-C40/Cartosat-2 Series Satellite Mission	SSPO	Earth Observation
Cartosat-2 Series Satellite	Jun 23, 2017	712 kg	PSLV-C38 / Cartosat-2 Series Satellite	SSPO	Earth Observation
Cartosat -2 Series Satellite	Feb 15, 2017	714 kg	PSLV-C37 / Cartosat -2 Series Satellite	SSPO	Earth Observation
RESOURCESAT-2A	Dec 07, 2016	1235 kg	PSLV-C36 / RESOURCESAT-2A	SSPO	Earth Observation
CARTOSAT-2 Series Satellite	Jun 22, 2016	737.5 kg	PSLV-C34 / CARTOSAT-2 Series Satellite	SSPO	Earth Observation

RISAT-1	Apr 26, 2012	1858 kg	PSLV-C19/RISAT-1	SSPO	Earth Observation
RESOURCESAT-2	Apr 20, 2011	1206 kg	PSLV-C16/RESOURCESAT-2	SSPO	Earth Observation
CARTOSAT-2B	Jul 12, 2010	694 kg	PSLV-C15/CARTOSAT-2B	SSPO	Earth Observation
RISAT-2	Apr 20, 2009	300 kg	PSLV-C12 / RISAT-2	SSPO	Earth Observation
CARTOSAT – 2A	Apr 28, 2008	690 Kg	PSLV-C9 / CARTOSAT – 2A	SSPO	Earth Observation
IMS-1	Apr 28, 2008	83 kg	PSLV-C9 / CARTOSAT – 2A	SSPO	Earth Observation
CARTOSAT-2	Jan 10, 2007	650 kg	PSLV-C7 / CARTOSAT-2 / SRE-1	SSPO	Earth Observation
CARTOSAT-1	May 05, 2005	1560 kg	PSLV-C6/CARTOSAT-1/HAMSAT	SSPO	Earth Observation
IRS-P6 / RESOURCESAT-1	Oct 17, 2003	1360 kg	PSLV-C5 /RESOURCESAT-1	SSPO	Earth Observation
The Technology Experiment Satellite (TES)	Oct 22, 2001		PSLV-C3 / TES	SSPO	Earth Observation
Oceansat(IRS-P4)	May 26, 1999	1050 kg	PSLV-C2/IRS-P4	SSPO	Earth Observation

Q.2) Study the following data standards-

BS 7666; CEN TC 287; DIGEST; DNF; GDF; GeoTIFF; GML; ISO 6709; ISO 8211; ISO 15046; NEN 1878; NTF; OGIS; RINEX; SDTS; UGDCS

Ans –

BS 7666 – British Standard BS 7666.

- Gazetteer users: who need to know what they will find in the gazetteer, and

get some idea of its quality, as well as being able to access the data;

- Gazetteer custodians: those responsible for creating and maintaining the

gazetteer;

- Gazetteer owners: those who retain the intellectual property rights (IPR) to

the gazetteer (but not necessarily to the IPR of every item of data in it);

- Data suppliers: those who supply the data, in whole or in part;

- System suppliers: who provide software for gazetteers and related

applications.

CEN TC 287- Standards, specifications, technical reports and guidelines, required to implement Spatial Data Infrastructure

-to identify standards required to implement a SDI in Europe;

-to propose a roadmap for future standards;

-to provide recommendations for measures to be taken in order to support implementation and maintenance of a SDI.

-Standardisation of digital geographic information

-Structured framework of standards and guidelines

-transfer geographic data and services

-Close co-operation with ISO/TC 211

-Consistent use of geographic information

-Support a spatial data infrastructure

DIGEST - The Digital Geographic Information Exchange Standard (DIGEST) was developed by the DGIWG (previously known as the Digital Geographic Information Working Group) to support efficient exchange of Digital Geographic Information among nations, data producers, and data users. It was designed as a "family of standards" capable of supporting the exchange of multiple data types (e.g. vector). DIGEST was first published in June 1991

with the release of Edition 1.0. It underwent a number of revisions and was last issued in September 2000 with the release of Edition 2.1.

While the exchange of data sets between national systems was sufficient at first, the requirement to distribute data products directly to military end users became more important over time. DGIWG set out to develop data product specifications that were compliant with DIGEST by addressing various types of data. Imagery (raster data), elevation data (matrix data), and boundary data (vector data) were addressed in different parts of the DIGEST standard. The capability to handle different encoding for the same data content was also introduced in DIGEST.

The DIGEST standard is divided into 4 parts:

Part 1 is a brief General Description of the standard.

Part 2 consist of Theoretical Model, Exchange Structure, Encapsulation Specifications (Annexes A through D) and a Standard ASCII Table of Contents (Annex E). The Part 2 encapsulations include: Annex A - Bulk interchange using the ISO 8211 data descriptive file format; Annex B - Transaction and update using the ISO 8824/8825 telecommunication standard; Annex C - Vector products using the Vector Relational Format corresponding to U.S. MIL-STD-2407; Annex D - Imagery using the NATO Secondary Imagery Format corresponding to ISO 12087-5, Basic Imagery Interchange format (BIIF)

Part 3 consists of Codes and Parameters

Part 4 is a Feature and Attribute Coding Catalogue (FACC) Data Dictionary.

DNF - The Digital National Framework (DNF) "is a definitive, consistent and maintained framework for the referencing of geographical information in Great Britain. It comprises the National Grid linked to Global Positioning System (GPS), height data, detailed topographic information and unique identifiers on features. Key elements are:

(1) Polygons: the building blocks of our data representing real world features;

(2) Maintained topographic identifiers (TOIDs) on all features;

(3) Seamless data;

(4) A themed classification based on the real world;

(5) Availability of data by themes;

(6) Metadata on each feature

GeoTIFF - The GeoTIFF format was originally created by Dr. Niles Ritter while he was working at the NASA Jet Propulsion Laboratory. The reference implementation code was released mostly as public domain software with some parts under a permissive X license. GeoTIFF is format extension for storing georeference and geocoding information in a TIFF 6.0 compliant raster file by tying a raster image to a known model space or map projection. A

GeoTIFF file is a TIFF 6.0 file, and inherits the file structure as described in the corresponding portion of the TIFF spec. The GeoTIFF format uses a defined set of TIFF tags to describe cartographic information associated with TIFF imagery that originates from satellite imaging systems, scanned aerial photography, scanned maps, digital elevation models, or as a result of geographic analyses.

GML - The OpenGIS® Geography Markup Language Encoding Standard (GML) The Geography Markup Language (GML) is an XML grammar for expressing geographical features. GML serves as a modeling language for geographic systems as well as an open interchange format for geographic transactions on the Internet. As with most XML based grammars, there are two parts to the grammar – the schema that describes the document and the instance document that contains the actual data. A GML document is described using a GML Schema. This allows users and developers to describe generic geographic data sets that contain points, lines and polygons. However, the developers of GML envision communities working to define community-specific application schemas.

ISO 6709 - ISO 6709:2008 is applicable to the interchange of coordinates describing geographic point location. It specifies the representation of coordinates, including latitude and longitude, to be used in data interchange. It additionally specifies representation of horizontal point location using coordinate types other than latitude and longitude. It also specifies the representation of height and depth that can be associated with horizontal coordinates. Representation includes units of measure and coordinate order.

ISO 6709:2008 is not applicable to the representation of information held within computer memories during processing and in their use in registers of geodetic codes and parameters.

ISO 8211- Specifies an interchange format to facilitate the moving of files or parts of files containing data records between computer systems. Specifies: media-independent file and data record descriptions for information interchange; the description of data elements, vectors, arrays and hierarchies containing character strings, bit strings and numeric forms; a data descriptive file; a data descriptive record; three levels of complexity of file and record structure; FTAM unstructured and structured document types.

NEN 1878 - This standard is a result of the working group “Standard Transfer Format for Geographic Data” of the Netherlands Council for Land Information (RAVI) that is published in the RAVI-advise nr 10: SUF-2. This standard distinguishes between spatial information about the terrain and about the map. Spatial information about the terrain can be described by this standard by its geometrical and nongeometrical (resemble as thematic) aspects, regardless of a later graphical presentation. The standard does not give the definitions or descriptions of technical concepts such as structures, data capture methods, precision, and accuracy and reliability of data. The standard NEN 1878 contains the definitions of terms

used in the standard such as object, entity, attribute, feature, file, record, and geometric primitives.

NTF - The National Transfer Format (NTF) is a file format designed in 1988 specifically for the transfer of geospatial information; it is administered by the British Standards Institution. It is now the standard transfer format for Ordnance Survey digital data.

OGIS -The Open GeoData Interoperability Specification (OGIS) project, underway since June 1993, is an attempt to design methods that provide an object oriented architectural framework for access to geodata, independent of the specific data structures and file formats used to model the data. From a user's point of view, OGIS allows access to geodata at remote locations, no matter the format. From an application developer's point of view, OGIS provides a set of network services to identify, interpret, and represent a dataset from a geodata server to a geoprocessing client.

RINEX - RINEX Version 2 is the format used by the IGS for operational data holdings. However, data support for additional GNSS, such as Galileo, QZS, and BeiDou, uses an enhanced version of RINEX available in Version 3. The CDDIS provides an archive of data from these additional GNSS through the IGS Multi-GNSS Experiment (MGEX). The IGS established MGEX to track, collate and analyze all available GNSS signals, including Galileo, QZSS, and BeiDou, as well as modernized GPS and GLONASS satellites and any space-based augmentation system (SBAS) of interest. Analysis centers will attempt to estimate inter-system calibration biases, compare equipment performance and further develop processing software capable of handling multiple GNSS observation data.

SDTS - Spatial Data Transfer Standard, or SDTS, is a standard used to describe earth-referenced spatial data. It was designed to easily transfer and use spatial data on different computer platforms. The FGDC has proposed to withdraw the standard and it is now replaced with GML.

UGDCS- The purpose of this Utilities Geospatial Data Content Standard (hereafter in this document abbreviated to Utilities Standard) is to standardize geospatial information for utility systems. This standard specifies the names, definitions and domains for utility system components that can be geospatially depicted as feature types and their non-graphical attributes. This Utilities Standard is classified as a Data Content Standard in the Federal Geographic Data Committee (FGDC) Standards Reference Model.