EaD Comprehensive Lesson Plans

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BASIC 8

WEEKLY LESSON PLAN – WEEK 7

Strand:	Introduction to Computing	**Sub-Strand:**	Components of Computers and Computer Systems

Content Standard:	B8.1.1.3. Demonstrate the use of Data and identify sources of data

Indicator (s)	B8.1.1.3.1 Learn Probabilistic Data Structures, and Distinct value Sketches.	**Performance Indicator:** learners can use or logical statements.

Week Ending	25-10-2024

Class	B.S.8	**Class Size:**		**Duration:**	

Subject	Computing
Reference	Computing Curriculum, Teachers Resource Pack, Learners Resource Pack, Textbook.

Teaching / Learning Resources	Personal Computer, Poster, Pictures, Word Chart, Power Point Presentation, Textbook.	**Core Competencies:**	• Communication and Collaboration • Digital Literacy

DAY/DATE	**PHASE 1 : STARTER**	**PHASE 2: MAIN**	**PHASE 3: REFLECTION**
TUESDAY	Discuss with Learners the meaning of keywords or terminologies in the lesson. **Keywords;** • Algorithm • Python • JavaScript • Counters • Logical statement • Automated systems	1. Using a Power Point Presentation, explain the concept of data structure to the Learners. 2. Discuss with Learners the sources and uses of data. 3. Assist Learners to identify ways data structures are used. **Data Structure;** A data structure is a specialized format for organizing, processing, retrieving and storing data. There are several basic and advanced types of data structures, all designed to arrange data to suit a specific purpose. Data structures make it easy for users to access and work with the data they need in appropriate ways. Most importantly, data structures frame the organization of information so that machines and humans can better understand it. **Some examples of how data structures are used include the following:** • **Storing data.** Data structures are used for efficient data persistence, such as specifying the collection of attributes and corresponding structures used to store records in a database management system.	Reflect on the importance of data structures. **Exercise;** 1. What is a data structure? 2. Explain 3 ways data structures are used.

		• **Managing resources and services.** Core operating system (OS) resources and services are enabled through the use of data structures such as linked lists for memory allocation, file directory management and file structure trees, as well as process scheduling queues. • **Data exchange.** Data structures define the organization of information shared between applications, such as TCP/IP packets. • **Ordering and sorting.** Data structures such as binary search trees -- also known as an ordered or sorted binary tree -- provide efficient methods of sorting objects, such as character strings used as tags. With data structures such as priority queues, programmers can manage items organized according to a specific priority. • **Indexing**. Even more sophisticated data structures such as B-trees are used to index objects, such as those stored in a database. • **Searching.** Indexes created using binary search trees, B-trees or hash tables speed the ability to find a specific sought-after item. • **Scalability.** Big data applications use data structures for allocating and managing data storage across distributed storage locations, ensuring scalability and performance. Certain big data programming environments -- such as Apache Spark -- provide data structures that mirror the underlying structure of database records to simplify querying. **Characteristics of data structures**	

Data structures are often classified by their characteristics. The following three characteristics are examples:

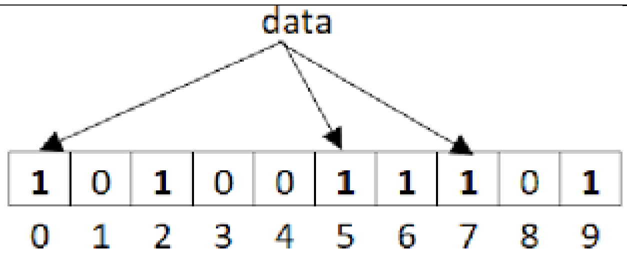
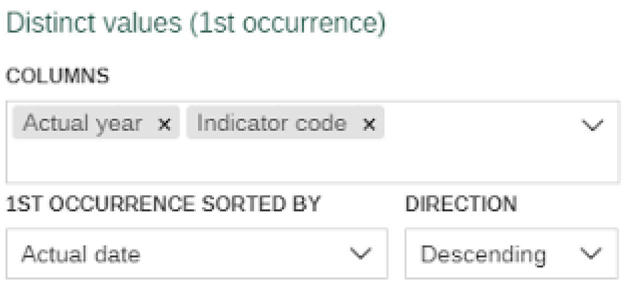
1. **Linear or non-linear.** This characteristic describes whether the data items are arranged in sequential order, such as with an array, or in an unordered sequence, such as with a graph.
2. **Homogeneous or heterogeneous.** This characteristic describes whether all data items in a given repository are of the same type. One example is a collection of elements in an array, or of various types, such as an abstract data type defined as a structure in C or a class specification in Java.
3. **Static or dynamic.** This characteristic describes how the data structures are compiled. Static data structures have fixed sizes, structures and memory locations at compile time. Dynamic data structures have sizes, structures and memory locations that can shrink or expand, depending on the use.

Data types

If data structures are the building blocks of algorithms and computer programs, the primitive -- or base -- data types are the building blocks of data structures. The typical base data types include the following:

- **Boolean**, which stores logical values that are either true or false.
- **integer**, which stores a range on mathematical integers -- or counting numbers. Different sized integers hold a different range of values -- e.g., a signed 8-

		bit integer holds values from -128 to 127, and an unsigned long 32-bit integer holds values from 0 to 4,294,967,295. • **Floating-point numbers**, which store a formulaic representation of real numbers. • **Fixed-point numbers**, which are used in some programming languages and hold real values but are managed as digits to the left and the right of the decimal point. • **Character**, which uses symbols from a defined mapping of integer values to symbols. • **Pointers,** which are reference values that point to other values. • **String**, which is an array of characters followed by a stop code -- usually a "0" value -- or is managed using a length field that is an integer value.	
THURSDAY	Demonstrate the use of logical statements with the use of counters for increasing and decreasing values.	1. Learners brainstorm to explain the meaning of Counters. 2. Learners in small groups to discuss on the use of Counters in automated systems. 3. Assist Learners to make sketches of Data Structure and Distinct Values. **Counters;** A Counter is a container that keeps track of how many times equivalent values are added. It can be used to implement the same algorithms for which bag or multiset data structures are commonly used in other languages. A Counter is a device that counts the number of objects or the number of operations. It is called a Counter because it counts the number of ON/OFF signals input from an input device, such as a switch or sensor.	Through questions and answers, conclude the lesson. **Assignment;** 1. What are Counters? 2. Explain 3 uses of Counters in Automated System.

		 Figure 1(b): Hashing in a Bloom Filter  Distinct values (1st occurrence) COLUMNS Actual year × Indicator code × 1ST OCCURRENCE SORTED BY: Actual date DIRECTION: Descending	

Name of Teacher: **School:** **District:**