1. Which data type best stores a yes/no flag like "in stock"?

   ☐ DATE

   ☐ STRING

   ☐ BOOLEAN

   ☐ REAL

2. An array stores:

   ☐ several fields of different types

   ☐ a single value

   ☐ many items of the same type, reached by an index

   ☐ only text

3. Why does a program write data to a file rather than keeping it in a variable?

   ☐ variables in RAM are lost when the program ends; a file persists

   ☐ files use no storage space on the disk

   ☐ variables cannot hold numbers, only text

   ☐ files are always faster to access than RAM

4. An Abstract Data Type (ADT) is defined by:

   ☐ the programming language only

   ☐ what operations it offers, hiding how the data is stored

   ☐ the exact memory addresses it uses

   ☐ the size of the screen

5. Pushing an item onto a stack that is already full causes a stack _____.

   _____

6. A real (floating-point) type should be used to store a measurement such as a temperature.

   ☐ True ☐ False

7. An array is a data structure holding many values of the _____ type under one name.

   _____

exercises.lol exercises.com.cn

_____

9. A stack works in which order?

   ☐ random order

   ☐ LIFO – last in, first out

   ☐ sorted order

   ☐ FIFO – first in, first out

10. Which belong in the declaration and initialisation of an array-based stack? Select **all** that apply.

    ☐ a MaxSize the push operation compares against

    ☐ an array with its size and element type

    ☐ a top-of-stack pointer initialised to 0

    ☐ a front pointer for the next item to leave

    Tick every correct option.

1. **BOOLEAN**

   A flag has two states, so BOOLEAN (TRUE/FALSE) is the precise choice – not the strings ”yes”/”no”.

2. **many items of the same type, reached by an index**

   An array is an ordered collection of same-type items accessed by index. (A record groups different types.)

3. **variables in RAM are lost when the program ends; a file persists**

   RAM is volatile, so data is lost on exit. A file on secondary storage persists between runs.

4. **what operations it offers, hiding how the data is stored**

   An ADT specifies the operations (the interface); the implementation is hidden and can change freely.

5. **overflow**

   Overflow = push when Top = MaxSize; popping from an empty stack (Top = 0) is underflow.

6. **True**

   Whole counts use integers; measurements use reals.

7. **same**

   Each value is reached by its index.

8. **APPEND**

   WRITE would start the file empty. APPEND keeps what is there and writes after it.

9. **LIFO – last in, first out**

   A stack is LIFO: the most recently pushed item is the first to be popped.

10. **a MaxSize the push operation compares against; an array with its size and element type; a top-of-stack pointer initialised to 0**

    A stack needs one pointer, Top. A front pointer belongs to a queue.

exercises.lol exercises.com.cn