

# Review-Activity1-Introduction

Thursday, January 23, 2020 8:35 AM

## Review Activity 1

### Introduction to Algorithms and Data Structures

- 1) "An algorithm is a sequence of instructions" as a definition does not address three important aspects/properties of algorithm design. List the three missing aspects/properties.

Aspect1:	Aspect2:	Aspect3:
//finite sequence of instructions  //terminates	//precisely defined instructions	//not a solution but a procedure for deriving solutions

- 2) Data structures play an important role with respect to algorithm design. Explain that role.

**Explanation:**

//they help organize data so that algorithms can easily manipulate their values  
//helps streamline the functionality of algorithms

- 3) Abstract Data Type (ADT) exposes only the interface (the operations) to external users, and hides the internal organization of data items. Explain two benefits realized through this design.

Benefit1:	Benefit2:
//it prevents the code from being changed by an outsider either purposefully or unintentionally (because they don't understand what's going on)	//its neater code and easier to test and maintain

- 4) Explain the encapsulation principle of ADT design. Just stating the definition is not enough. Also, give a short code example.

<p><b>Explanation:</b></p> <p>//classes contain all the resources needed to function such as attributes(variables) and methods(functions)</p> <p>//it bundles everything that is related together and helps to organize the code</p>	<p><b>Example:</b></p> <pre> class Squishmallows() {     int num_of_animals;     double dollar_value; public:     Squishmallows( int new_num, double new_value ) : num_of_animals(new_num), dollar_value(new_value) { }      bool has_too_many( int num_animals ) {         Bool too_many = false;         If( num_animals &gt; 20 )             Too_many = true;     } }; </pre>
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- 5) In the list below, check all statements that apply to class constructors. That is, insert a checkmark for all the items that are true when it comes to constructors.

<input checked="" type="checkbox"/> Used to initialize objects <input checked="" type="checkbox"/> Initialize some or all member variables <input type="checkbox"/> May be called multiple times on the <u>same</u> object	<input checked="" type="checkbox"/> A special kind of member function <input checked="" type="checkbox"/> Default one is provided automatically <input checked="" type="checkbox"/> Automatically called when an object is instantiated	<input type="checkbox"/> The name is chosen by user <input type="checkbox"/> Always return void <input checked="" type="checkbox"/> If any constructor is explicitly defined, then the default one is not provided
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- 6) In the list below, check all statements that apply to class destructors. That is, insert a checkmark for all the items that are true when it comes to destructors.

<input type="checkbox"/> More than one exists <input checked="" type="checkbox"/> Called automatically at the end of scope <input checked="" type="checkbox"/> Deallocate memory assigned to an object	<input checked="" type="checkbox"/> May be called manually to free up a dynamic object <input type="checkbox"/> Accept parameters <input type="checkbox"/> Cannot be explicitly defined
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