Math: Organize - Data.
- Collections of objects.
  - Set, sequence, function, propositions, relationship.

- Abstract Data type -
  A mathematical object together with operations on that object.
  
  Integer
  \[ + \quad - \]
  \[ \times \quad \div \]

- Data Structure -
  A particular implementation of an Abstract Data Type.

int    short    long

ADT  |  OS
<table>
<thead>
<tr>
<th>ADT</th>
<th>DS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integer</td>
<td>Int, long</td>
</tr>
<tr>
<td>Real Number</td>
<td>float, double</td>
</tr>
</tbody>
</table>

Selection of a DS depends on the relevant ADT operations necessary to solve the problem.

Ex: “What is the sum of the digits of 100!?”

\[ 100! = 100 \cdot 99 \cdot 98 \cdot 97 \cdot 96 \cdot \ldots \cdot 2 \]

Data Structures building blocks

- Classes
- Arrays
- Pointers