⏱ **2h**

A list is a set of nodes arranged linearly (one after the other). Each node contains, in addition to its data, a pointer pointing to the next node. The pointer of the last node does not point to a node and it is NULL.

Create a list

A list in B4X is declared as follows:

```
Private Islands  As List
Islands.Initialize
```

Where Islands the name of the list created. In addition, a list to be used must be initialized using the initialize method.

Items are imported into the list using the Add method, which adds a new item to the end of the list.

```
Islands.Add("Piraeus")
Islands.Add("Paros")
Islands.Add("Thira")
Islands.Add("Crete")
```


You can also insert items in a table at the end of the list with the AddAll command.

```
Islands.AddAll(Array as String("Piraeus", "Paros", "Naxos", "Crete"))
```
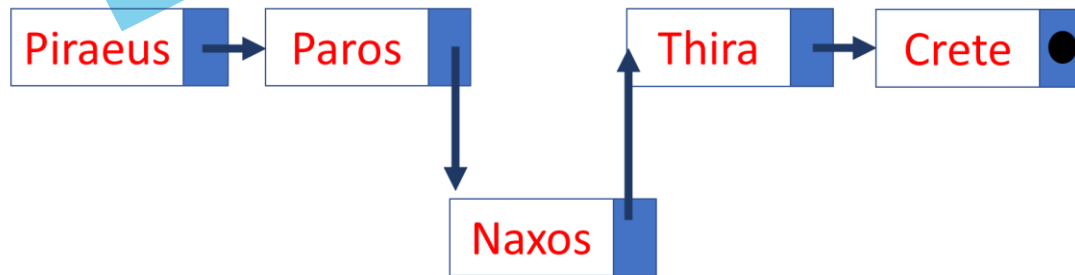
Remember

List items counts from 0. So, a list with 4 elements has the element(0) until element(3)

Anywhere Software

Insert an item in a specific location

To insert between two elements a third you can use the **InsertAt** property
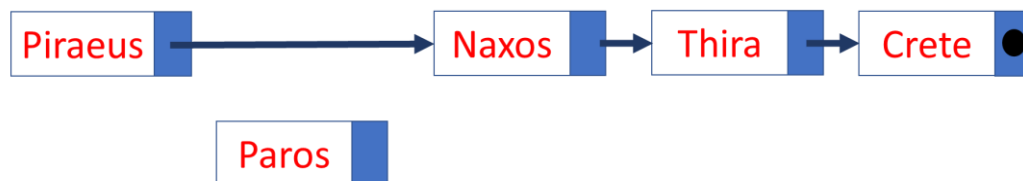


```
Islands.InsertAt(2, "Naxos")
```

In the above example is inserted between Paros and Thira the island of Naxos in 3rd place.

Remove an item from a specific location

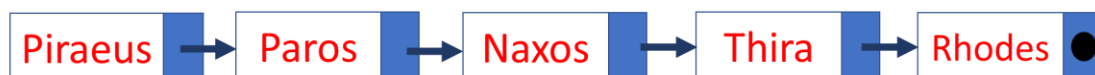The RemoveAt command removes a list item from a specific location.


```
Islands. RemoveAt(1)
```

In the example above, Paros's island is removed from the list.

Change position value

With Set command you to change one value of a location with another value that you enter.

```
Islands.Set(4, "Rhodes")
```


Here the value of 5th place changes to "Rhodes".

Anywhere Software

More commands in lists

1. List size.


```
Islands.Size
```

In the list of the image returns the value 5.

2. Sort a list. You can sort a list in ascending or descending order with sort

```
Islands.Sort(True) ' Sortby ascending order
Islands.Sort(False) ' Sortin descending order
```


Islands.Sort(True)

Islands.Sort(False)

3. Empty List
   A list empties with the Clear command

```
Islands.Clear
```

4. Move through a list

Moving within a list with a repetitive command

```
For i = 0 to Islands.Size – 1 'Remember it begins from 0
   Log(islands.Get(i))
Next
```

5. You can take advantage of the values in a list by assigning its values to other variables:

```
For i = 0  to  Islands.Size  – 1
   Private isle  As String
   Isle = islands.Get(i)
   Log(Isle)
Next
```

Anywhere Software

3

6. Insert other types of items

A list can store items of any simple or complex type you want. For example, each item in a list could be an object or an entire table.

In the following example, each item in a list is an integer table:

```
'Create a list of arrays
Private StudentsGrades  As List   1
StudentsGrades.Initialize

For j = 0  To  4
   Private Grades(5)  As Int    2
   For i = 0  To  4
      Grades(i) = Rnd(1, 100) 'Create 5 random Grades For student
   Next
   StudentsGrades.Add(Grades)    3
Next

'Show Students Grades
For j = 0  To  StudentsGrades.Size - 1
   Log("Student: " & j)
   Private stGrades(5)  As Int  = StudentsGrades.Get(j)   4
   For I  = 0  To  4
      Log(stGrades(i))   5
   Next
Next
```
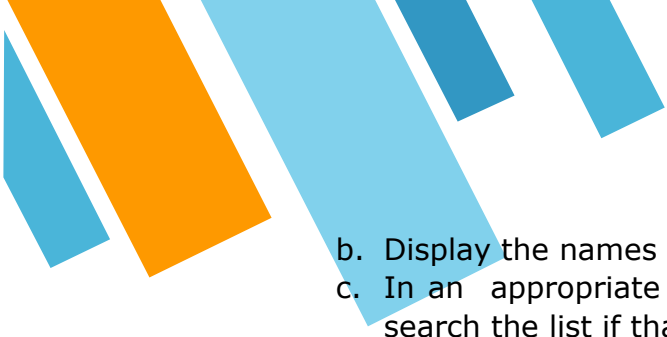
1. The list is declared and initialized
2. For 5 elements in the list, an equal number of tables are created with random numbers between 1 and 100
3. Each table is placed at the end of the list with the Add command
4. For all items in the list, a table is filled by the item in the list
5. The table we got from each item is displayed.

Exercises

1.
   a. Create a list of Country and Capital Names. For example, you can use the following countries.

CUBA	HAVANA
CYPRUS	NICOSIA
CZECHIA	PRAGUE
EGYPT	CAIRO
KENYA	NAIROBI
MEXICO	MEXICO CITY
PERU	LIMA
VIETNAM	HANOI
PORTUGAL	LISBON

Source: https://www.boldtuesday.com/pages/alphabetical-list-of-all-countries-and-capitals-shown-on-list-of-countries-poster

Anywhere Software

b. Display the names of countries starting with the letter "P"
c. In an appropriate text field, enter name of a country and then search the list if that country exists and display the capital city.
d. Make a button to show a dialog asking for new country and capital and add it to list.