**Record declaration:**

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**To change something inside the record:**

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**If you want to change the record value by using its own values, then we will use this method: Here point is changing its value by adding its own value.**

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**A way to declare record with another name:**

****

**Here point is the struct, but we change its name from struct to origo.**

**Here are some other implementations as well.**

**A math equations on a white background

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**Some other implementations:**

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**Simplify function for Q struct:**

**A math equation with black text

Description automatically generated with medium confidence**

****

**This is the function to just convert 2 numbers into rational struct.**

****

**Arrays:**

If you want to declare the array you should have to write through this way:

A black text with numbers

Description automatically generated

Otherwise, you will receive this error.

A screenshot of a computer

Description automatically generated

There are only 2 built-in functions for trees:

* Size to get the size of the array but it will only work for array name not for this {1,2,3,5}. Otherwise, this error.

A screen shot of a computer

Description automatically generated

* And for indexing you can use subscripts with dot. MyArray.[2] to get the value at 3rd index. Like in list (!!).

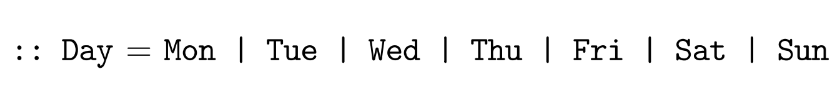
Note : You can implement all the list functions by just converting the array into list by using comprehension transformation.

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Description automatically generated

In comprehension we use (<-:) this sign for arrays.

Algebraic Data Types:



This is the implementation of making algebraic data types. Here “|” this symbol is just used to make another possibility of new value.

**Trees:** This is the way through which we make the trees:

**A close up of a word

Description automatically generated**

**Here Node a is the root and (Tree a) is the left and right child of the root. This shows that this tree is binary.**

**To get the size or length of the tree:**

**A math equations with arrows and numbers

Description automatically generated with medium confidence**

**This will calculate the number of nodes in the tree.**

**To get the height or depth of the tree.**

**A math equations and numbers

Description automatically generated with medium confidenceIt will calculate the levels within the tree.**

In this example we are sorting the array with the help of tree.(check the last page of register).

**A screenshot of a computer program

Description automatically generated**

**In this example tree has two values a and b. a is for node and b is for leaf then he wrote a function to calculate the sum of leaves.**

A white paper with text and numbers

Description automatically generated

**Different types of Trees:**

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Description automatically generated** **A screenshot of a computer

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**Abstract Data Types:**

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Description automatically generated**

**This is the example and implementation of abstract data type.**

**Please remember to initialize the abstract data type we use:== and in algebraic data type we use ( = && also use this | ) . synonyms.**

* **THINGS TO REMEMBER:**

**A math equations and formulas

Description automatically generated with medium confidence**

**A screenshot of a computer

Description automatically generated**

**Instances && Classes:**

**A math equations on a white background

Description automatically generated**

**Some easy examples: (Don’t forget to add preConditions ). There are also some examples of making instances by using words like in the first case we use increment (++) to increase the element by 1.**

**A math equations on a white background

Description automatically generated**

**Before that I discuss unary operators but to declare binary operators, we use this method this one is little bit different here you can also see the use of switch case.**

**A screenshot of a computer code

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**Classes:**

**A screenshot of a computer program

Description automatically generated**

**This is the method to make a class.**

**Rataional Struct is very important: please remember that.**

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Description automatically generated**

**Things to remember in complex number struct:**

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**A black text with red and blue letters

Description automatically generated**

**Single tree -> this tree has only 1 branch.**

**MAP Class:**

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**-> Just view the last slides of the map class for backup.**

**QUIZES TO REMEMBER:**

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