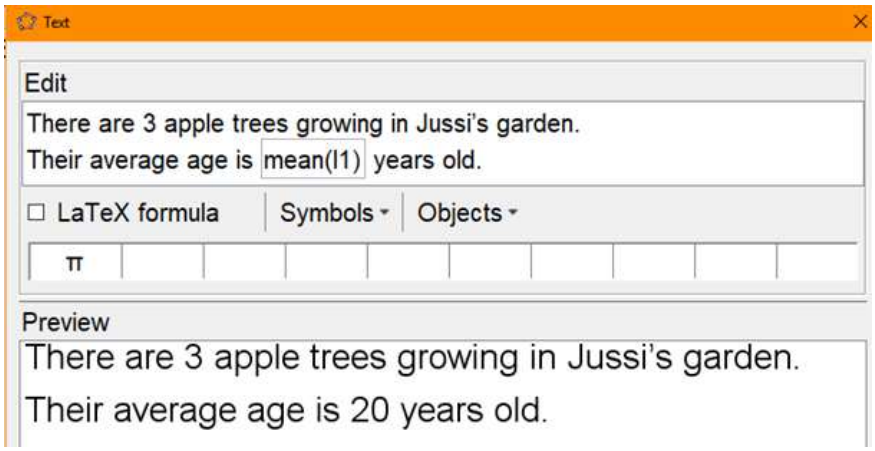
By following this step-by-step guide an exercise will be created in what there are three apple trees growing in the garden and their ages are divided by 3 in range of 3-30. One to three trees will be additionally planted in the age range of 1-3. At the end of the exercise the oldest tree will be cut down. The student must answer to six different questions. There will be space for rough notes at the end of the exercise. Over there the student may try different combinations of trees' ages and he/she can also see the average age of the given trees and also the age difference between all the trees. In the rough notes age of the student doesn't matter. The answer will be checked only if the question mark has been changed by a number. If the answer is correct it should be colored green in the other scenario it will be colored red. There is also a button for replaying the given exercise.

1. List for generating the first 3 ages in range of 3-30.
   Sequence(<Expression>, <Variable>, <Start Value>, <End Value>)
   Sequence(RandomBetween(1, 10) 3, x, 1, 3) : List *l1* will appear.
2. Let's sort the list ascending to make things comfortable in the nexts steps.
   Sort(<List>)
   Sort(l1) : List *l2* will appear.
3. We will add the text of the task  .
   

   Text1 will appear.
4. We add text that includes the assignment to the student  .
   Find the ages of the apple trees, if the oldest tree is Max(l2) - Element(l2, 1) and Max(l2) - Element(l2, 2) years older. : *Text2* will appear.
5. The following numbers and boolean values are created to verify the student`s answer. We will print the following lines on the *Intput line.* The resulting numbers *answer1* - *answer6.* Total 6 numbers.
   a. answer1 = 1
   b. ...
   c. answer6 = 1
   Let`s create Boolean Values. 12 Boolean Values will be made. The first 6 of them

we will use to check if there is any answer at all and the last ones will be used to check correctness of the answer.

d. In1 = true
e. ...
f. In6 = true
g. rightness1 = true
h. ...
i. rightness6 = true

6. The student has the option to answer the question using the *Input Box*  .
   Caption Age of the oldest tree in full years.
   Choose *answer1* as the linked object. *InputBox1* will be made.
   Object Properties → Style → Input Box Length - enter a value 3.
   Object Properties → Advanced → Dynamic Colours → Red in1 ≟ true ∧ rightness1 ≟ false.
   Object Properties → Advanced → Dynamic Colours → Green in1 ≟ true ∧ rightness1 ≟ true.
   Object Properties → Scripting → On Click
   SetValue(in1, true)
   SetValue(rightness1, If(answer1 ≟ Element(l2, 3), true, false)).

7. The student has the option to answer the question using the *Input Box*  .
   Caption The age of the middle tree in full years.
   Choose *answer2* as the linked object. *InputBox2* will be made.
   Object Properties → Style → Input Box Length - enter a value 3.
   Object Properties → Advanced → Dynamic Colours → Red in2 ≟ true ∧ rightness2 ≟ false.
   Object Properties → Advanced → Dynamic Colours → Green in2 ≟ true ∧ rightness2 ≟ true.
   Object Properties → Scripting → On Click
   SetValue(in2, true)
   SetValue(rightness2, If(answer2 ≟ Element(l2, 2), true, false)).

8. The student has the option to answer the question using the *Input Box*  .
   Caption Age of the youngest tree in full years.
   Choose *answer3* as the linked object. *InputBox3* will be made.
   Object Properties → Style → Input Box Length - enter a value 3.
   Object Properties → Advanced → Dynamic Colours → Red in3 ≟ true ∧ rightness3 ≟ false.
   Object Properties → Advanced → Dynamic Colours → Green in3 ≟ true ∧ rightness3 ≟

true.

Object Properties → Scripting → On Click

SetValue(in3, true)

SetValue(rightness3, If(answer3 ≟ Element(l2, 1), true, false)).

9. Let's create two random numbers for the next question.
   a. We'll set the amount of new planted trees by using a randomly generated number in range of 1-3.
      RandomBetween(<Minimum Integer>, <Maximum Integer>)
      amount = RandomBetween(1, 3) : The number *amount* appears.
   b. We'll set the ages of the new trees with randomly generated numbers in range of 1-3.
      RandomBetween(<Minimum Integer>, <Maximum Integer>)
      age = RandomBetween(1, 3) : The number *age* appears.
10. Let's add a text with including a question  .
    How the average age of the trees will change if Juss planted certain amount of trees (Every tree is age years old)? : *Text3* will appear.
11. Let's find the comparable averages one by one.
    a. Mean(l1) : Number *a,* will appear, its the average of the first 3 trees.
    b. round((Element(l1, 1) + Element(l1, 2) + Element(l1, 3) + amount age) / (Length(l1) + amount), 0) : Number *b* will appear which shows the new average of the planted trees rounded up to 1's.
12. First we ask how the average age of the trees changes.
    Type {"Choose the answer", "decreasing","doesn't change", "increasing"}.in the *Input Line* and hit enter. You now have a list called *l3*.
    Object Properties → Basic → Caption The average age of the trees.
    Object Properties → Basic → Choose Draw as drop-down list
    Object Properties → Advanced → Dynamic Colours → Red in4 ≟ true ∧ rightness4 ≟ false.
    Object Properties → Advanced → Dynamic Colours → Green in4 ≟ true ∧ rightness4 ≟ true.
    In order to check that we need to change the definition of *in4, rightness4* and *answer4.*
    a. *In4* Object Properties → Basic → Value If(answer4 ≟ 0, false, true).
    b. *Rightness4* Object Properties → Basic → Value If(a < b ∧ answer4 ≟ 3 ∨ a ≟ b ∧ answer4 ≟ 2 ∨ a > b ∧ answer4 ≟ 1, true, false).
       c. *Answer4* Object Properties → Basic → Value If(SelectedIndex(l3) ≟ 2, 1, If(SelectedInde ≟ (l3) ≟3, 2, If(SelectedIndex(l3) ≟ 4, 3, 0)))
13. The student has the option to answer the question using the *Input Box*  .
    Caption Now the average of the planted trees is given in full years.

Choose *answer5* as the linked object. *InputBox4* will be made.
Object Properties → Style → Input Box Length - enter a value 3.
Object Properties → Advanced → Dynamic Colours → Red in5 ≟ true ∧ rightness5 ≟ false.
Object Properties → Advanced → Dynamic Colours → Green in5 ≟ true ∧ rightness5≟ true.
Object Properties → Scripting → On Click
SetValue(in5, true)
SetValue(rightness5, If(answer5 ≟ b, true, false)).

14. We will provide additional information as text  .
The oldest tree fell down during the last storm and dad cut it down. : Text 4 will appear.

15. The student has the option to answer the question using the *Input Box*  .
Caption After cutting down the tree the average age of the trees is in full years.
Choose *answer6* as the linked object. *InputBox5* will be made.
Object Properties → Style → Input Box Length - enter a value 3.
Object Properties → Advanced → Dynamic Colours → Red in6 ≟ true ∧ rightness6 ≟ false.
Object Properties → Advanced → Dynamic Colours → Green in6 ≟ true ∧ rightness6 ≟ true.
Object Properties → Scripting → On Click
SetValue(in6, true)
SetValue(rightness6, Kui(answer6 ≟ round((Summa(l2) - Max(l2) + amount age) / (Pikkus(l2) – 1 + amount), 0), true, false)).

16. Let's create an option for the student to try out hi/hers ideas. We will create an input box for every tree and will show the calculation of the average simultaneously. We'll change the color of the aiding materials to light gray.

    a. Let's add a text with instrotuctions  .
    Here you can try out you answers before answering! : *Text5* will appear.
    Object Properties → Colour → Foreground Colour → gray.
    Object Properties → Colour → Background Colour → light green.

    b. Let's create 3 numbers for every tree's age. Type on the *Input Line:*
    tree1 = 1
    tree2 = 1
    tree3 = 1.

    c. Use *Input Box* to inserting the age of 1. tree  .
    Caption 1. tree's age.
    Choose *tree1* as the linked object. *InputBox6* will be made.

Object Properties → Colour → Foreground Colour → gray.
Object Properties → Style → Input Box Length - enter a value 3.

d. Use *Input Box* to inserting the age of 2. tree  .
Caption 2. tree's age.
Choose *tree2* as the linked object. *InputBox7* will be made.
Object Properties → Colour → Foreground Colour → gray.
Object Properties → Style → Input Box Length - enter a value 3.

e. *Input Box* for inserting the age of 3. tree  .
Caption 3. tree's age.
Choose *tree3* as the linked object. *InputBox8* will be made.
Object Properties → Colour → Foreground Colour → gray.
Object Properties → Style → Input Box Length - enter a value 3.

f. Let's add a text which should calculate the average by using the student given numbers  .
\bar{x} = \frac{tree1 + tree2 + tree3} {3} = (tree1 + tree2 + tree3) / 3 : *Text6* will appear.
Object Properties → Colour → Foreground Colour → gray.

g. Let's add a Check Box for showing *text6* made in last step  .
Caption Average age.
Select objects in construction or choose from list → choose *text6*. A Boolean Value *d* will appear.
Object Properties → Colour → Foreground Colour → gray.

h. Text for showing the age differences between trees  .
\begin{array} {} age of the 1st tree - age of the 2nd tree = tree1 - tree2 \\age of the 1st tree - age of the 3rd tree = tree1 - tree3 \\ \end{array} : *Text7* will appear.
Object Properties → Colour → Foreground Colour → gray.

i. Let's add a Check Box for showing *text7* made in last step  .
Caption Age similarities between different trees.
Select objects in construction or choose from list → choose te*xt7*. Tekib tõeväärtus *e*.
Object Properties → Colour → Foreground Colour → gray.

17. Let's add a button for the student to generate new exercises repeatedly  .
Caption should be named: New data.
In *GeoGebra*'s Script we will write:
UpdateConstruction( )

SetValue(l3, 1)
SetValue(d, false)
SetValue(e, false)
SetValue(in1, 0)
SetValue(rightness1, 0)
SetValue(answer1, ?)
SetValue(in2, 0)
SetValue(rightness2, 0)
SetValue(answer2, ?)
SetValue(in3, 0)
SetValue(rightness3, 0)
SetValue(answer3, ?)
SetValue(in4, 0)
SetValue(rightness4, 0)
SetValue(answer4, ?)
SetValue(in5, 0)
SetValue(rightness5, 0)
SetValue(answer5, ?)
SetValue(in6, 0)
SetValue(rightness6, 0)
SetValue(answer6, ?). *Button1* should appear.

18. Illustratrion is added as an Image .