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Mathematical modelling and computer simulations in theory and practice

Documentation of laboratory task no 7

Title: BEZIER CURVES

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Field of studies: Informatics (sem.V)

Project Objective:
Project objective is to create some nice, fancy, funny, interesting shapes with the aid of Bezier curves.

Description:
Bezier curves are type of parametric curve and they can be easily applied in Mathematica. We can also perform some operations, like translation, rotation etc. We will use those to create a few parametrised shapes that will be used in a Flower generator – our program will enable us to custimise our own flower.

Program has defined shape of leaf and petal that is further transformed – translated and rotated in a tables to form final desired shape.

Inputs:
1. Flower head size.
2. Flower height (which is also linked to number of leaves, what is further described in Outputs)
3. Number of petals – the floor of the value will be used (it need to be intiger)
4. Size of petals.
5. Size of leaves.

Most of the inputs are only parameters that only roughtly give us the exact size (or not at all).

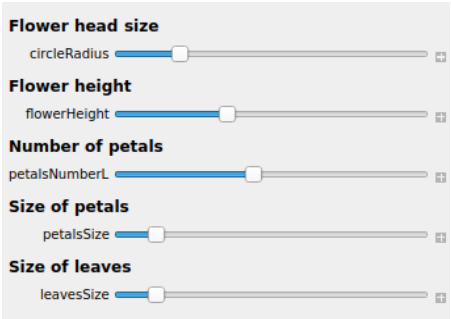

Figure 1: Program input

Outputs:
As an otuput we can observe our flower. It's worth to note a few things:
- Higher flower will have more leaves. Some examples are given below.
- Petals are spaced in equal distances.
- Leaves are spaced in equal distances (both angulary and on the height of he flower).
- Flower head is always on the top of the flower.

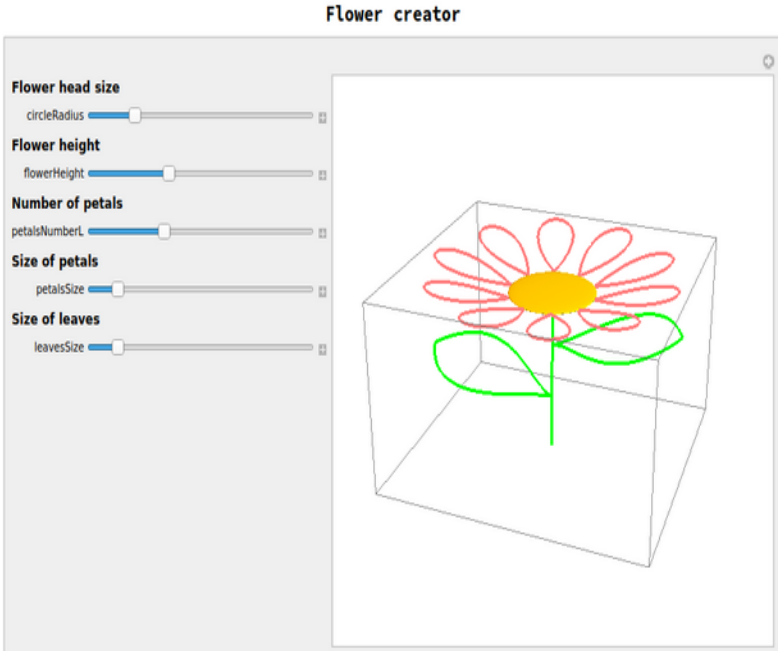

Figure 2: Examplary output 1.

If the size of the petals and the flower head overall are small, than petals are going to be visibly tilted upwards – just like the flower have just oppened.

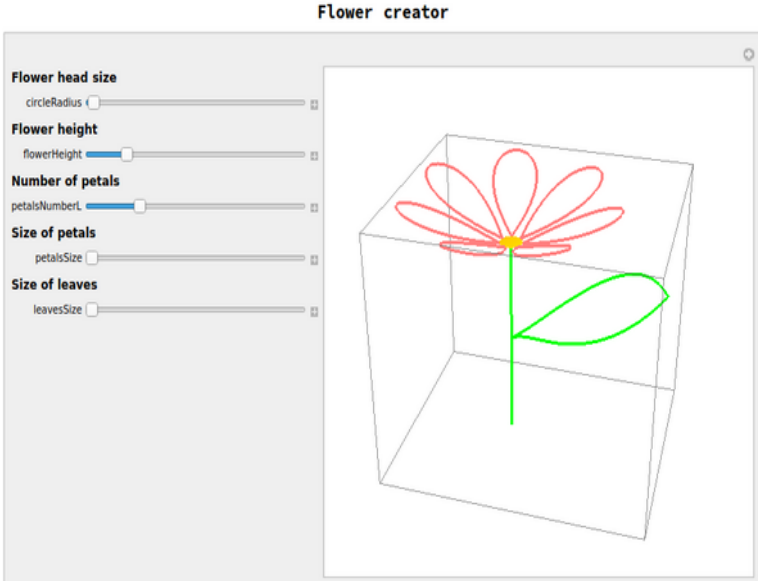

Figure 3: Examplary output 2 – petal tilted upward.

Enclosures:

❑ File with the program (Jędrzejczyk_Radosław_proj_7)