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| --- | --- |
| Last Name |  |
| First Name |  |

**Questions regarding the algorithm shown in the tutorial.**

A) List the main **parts** of the algorithm (ex: input loads, resultant…).

...

...

...

B) List the main variables of the algorithm.

...

...

...

C) Is Grasshopper an appropriate software to build the algorithm shown in the tutorial? Why? (**max. 15** words!)

...

...

...

**Task 1**. **Additional load**

A) Paste two screenshots of two different funicular structures loaded with three loads.

|  |  |
| --- | --- |
| screenshot of the Rhino viewport,  showing the form and force diagram  in **configuration A** | screenshot of the Rhino viewport,  showing the form and force diagram  in **configuration B** |

B) List the parts of the algorithm (ex: input loads, resultant…) that you have to modify in order to add the third load.

...

...

...

C) What would be the disadvantage of using this workflow if you would have to add 20 loads? (**max. 15** words!)

...

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...

**Task 2**. **Change of rise**

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1. With which **geometric** element can you change the rise of the funicular structure using the force diagram? (**max. 5** words!)

...

B) Paste two screenshots of two different funicular structures with different rises.

|  |  |
| --- | --- |
| screenshot of the Rhino viewport,  showing the form and force diagram  in **configuration A** | screenshot of the Rhino viewport,  showing the form and force diagram  in **configuration B** |

**Task 3**. **Tributary areas**

A) List the parts of the algorithm (ex: input loads, resultant…) that you have to modify in order to take into account the tributary areas.

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...

**Task 4**. **Constrained force diagram**

A) List the two constraints that we are taking into account in this exercise.

...

...

B) List the parts of the algorithm (ex: input loads, resultant…) that you have to modify in order to add the force diagrams constraints.

...

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...

C) According to the algorithm shown in the tutorial, what geometric condition must be fulfilled in the force diagram to ensure that the funicular structure is in tension? (**max. 15** words!)

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...

D) Apart from the two constraints listed above, which other constraint you could imagine integrating in your algorithm? (**max. 15** words!)

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...

E) Paste two screenshots of two different constrained funiculars.

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| --- | --- |
| screenshot of the Rhino viewport,  showing the form and force diagram  in **configuration A** | screenshot of the Rhino viewport,  showing the form and force diagram  in **configuration B** |

**Task 5**. **Design exploration**

A1) Paste two screenshots of your favourite bridge designs

|  |  |
| --- | --- |
| screenshot of the Rhino viewport,  showing the form and force diagram,  of your **favourite design A** | screenshot of the Rhino viewport,  showing the form and force diagram,  of your **favourite design B** |

A2) Why did you choose the designs above? (**max. 15** words!)

...

...

B1) Paste one screenshot of the rarest equilibrium design your model is able to create

|  |
| --- |
| screenshot of the Rhino viewport,  showing the form and force diagrams |

B2) What is it so rare about it? (**max. 15** words!)

...

...

...

C) With the knowledge and skills you gained until now building parametric equilibrium models using graphic statics and Grasshopper, you can surely imagine creating different designs than the one we showed you. Sketch by hand using red and blue colours two schemes you would like to design. Consider for this three acting point loads representing the weight of the bridge deck.

|  |  |
| --- | --- |
| screenshot of the Rhino viewport,  showing the form and force diagram,  of your **favourite design A** | screenshot of the Rhino viewport,  showing the form and force diagram,  of your **favourite design B** |