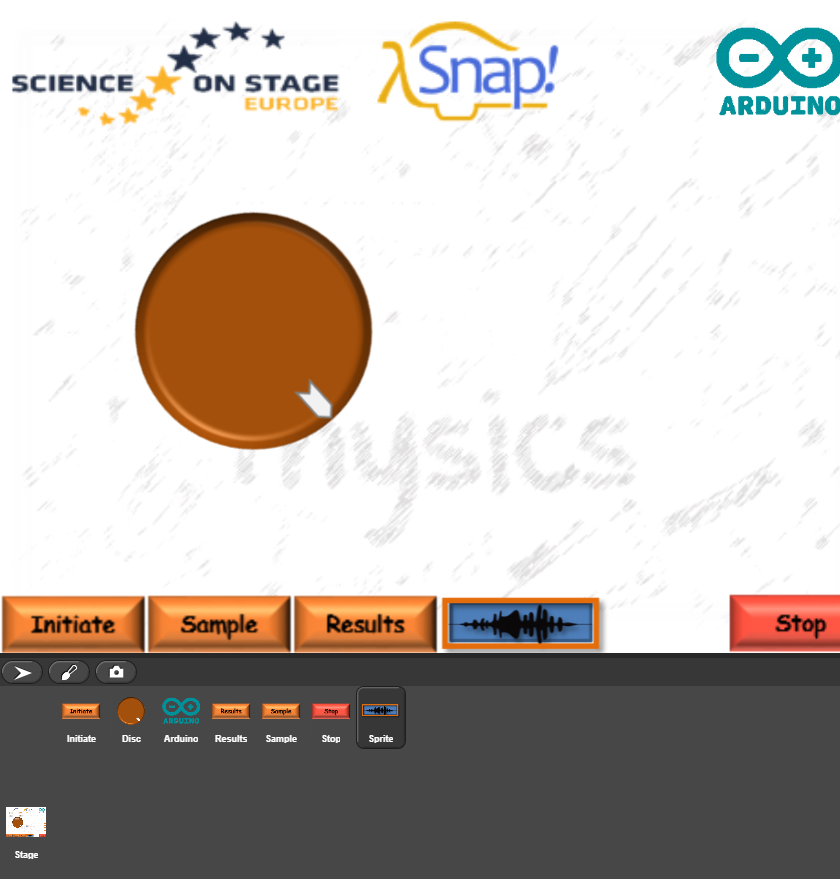
**Students work assignment**

**The basic template .xml file**



Please note that the above brown disc, indicated by the little blue arrow, changes size according to the entered value of radius and rotates during the experiment.

**Initiate :** Used for the input of the various parameters needed to run the program :

* Arduino connection port
* Digital pin to which the infrared sensor has been connected
* Radius of the disc
* Time in seconds for data acquisition

**Sample :** Used for the activation of the sensors and data acquisition from the sensor.

**Result :** Calculations and display of the results.

**Sound** : Processing of the sound spectrum data.

**Stop :** Termination of the code execution at any time if needed.

**Assignments**

**Assignment 1**



|  |  |
| --- | --- |
|  | On the **Initiate button sprite script,** implement the two blocks, Input Arduino and Input Parameters. You must read the user input and validate the data for the program to run.  **Input Arduino:**   * Name of the Arduino’s connection port (eg. COM3) * Digital pin for infrared sensor, accepted values 1..5   **Input Program Parameters:**   * Radius of Disc, accepted values 2..25cm * Data acquisition time, accepted values 5..20sec |

**Assignment 2**



|  |  |
| --- | --- |
|  | On the **Sample button sprite script,** check that the necessary parameters have been given by the user and start the sensor to receive the data.  For a better user interface, show a time countdown until the end of the running period.  **Use the broadcast message**  **StartDisk: to start the infrared sensor**  **Stop: to stop the sensor when the time over.** |

**Assignment 3**



|  |
| --- |
|  |
| On the **Arduino sprite script** you have to create the code   * for connecting the Arduino after the User enters the parameters by pushing the Initiate button (Ready) * read and process the data from the motion sensor (StartDisk) |

**Assignment 4**



|  |  |
| --- | --- |
|  | On the **Result button sprite script,** you have to display the following results.  **f=1/T**, **ω=2π/Τ** and **v=2πR/T**  For displaying the results, you will use string variables and join the result value with the **appropriate** measurement unit**.** |

**Assignment 5**

**Step 1**

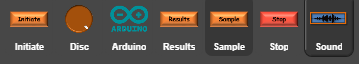
To start the last assignment you have to record the sound of the. We will use the open source Audacity application.

**Step 2**

Right click the string variable and load the sound Data you got by using Audacity.



On the **sound** button, write the script to process the Sound Data



|  |  |
| --- | --- |
|  | 1. split the data in two lists 2. find the two frequencies with the highest level 3. apply the Doppler Equation      1. Display Results |