Control Flowchart

```
Start
  │
  ▼
Initialise Menu window
  │
  ▼
Has an Exception occurred? ──Yes──> Print Stack Trace ──> Stop
  │ No
  ▼
Has an Event been triggered? ──No──> (loop back)
  │ Yes
  ▼
Has Exit Been Clicked? ──Yes──> Stop
  │ No
  ▼
Has Done Been Clicked? ──No──> Has Help Been Clicked? ──No──> Has Load Been Clicked?
  │ Yes                          │ Yes                          │ Yes
  ▼                              ▼                              ▼
Generate system from menu data   Open browser with help page   Does File Exist?
```

Open Error Dialog ──> Stop

Has An Exception occured? ──No──> (loop)

Add new box to menu containing data for a new body

Was Existing body added? ──> Set menu data to data of existing body

Has Add been clicked ──No──> Has Save Been Clicked? ──Yes──> Is file name blank? ──Yes──> Generate save data from menu data ──> Write data to file

Yes (Add) ──> Add new box to menu containing data for a new body

Open Error Dialog

Does File Exist? ──Yes──> Attempt to read data from file ──> Has Error Occured? ──Yes──> Open Error Dialog
Has Error Occured? ──> Set menu data to file data

Open Error Dialog

Initialise Graphics Window
  │
  ├──> Begin Mechanics Process
  │   │
  │   ▼
  │   Has the stop function been called? ──Yes──> Stop
  │   │ No
  │   ▼
  │   For each pair of bodies
  │   Find acceleration on each, add to acceleration array
  │   For each body
  │   according to timestep, increment position and velocity
  │
  ├──> Begin Graphics Process
  │   │
  │   ▼
  │   Set focal length of camera to the radius of the bounding sphere of the system
  │   │
  │   ▼
  │   Set zoom such that screen is tangent to furthest body's bounding circle
  │   │
  │   ▼
  │   Has the stop function been called? ──Yes──> Stop
  │   │ No
  │   ▼
  │   Sort bodies by distance to camera
  │   For each body
  │   according to camera transformation, draw body and trail relative to the system's "origin"
  │   │
  │   ▼
  │   Add current position relative to origin to trail array
  │   │
  │   ▼
  │   Is trail array over maximum trail length? ──No──> (loop)
  │   │ Yes
  │   ▼
  │   remove elements from start of trail array to fit maximum size
  │
  └──> Begin Input Process (Event based)
          │
          ▼
       Has Input Event Happened? ──No──> (loop)
          │ Yes
          ▼
       Was ESC Pressed? ──Yes──> Terminate Graphics and Mechanics Process
          │ No   │
          ▼   ▼
       Modify variables of   Initialise new Menu object
       Graphics process   │
       according to input   ▼
                                  Pass current state of system to load function

Set menu data to file data
```