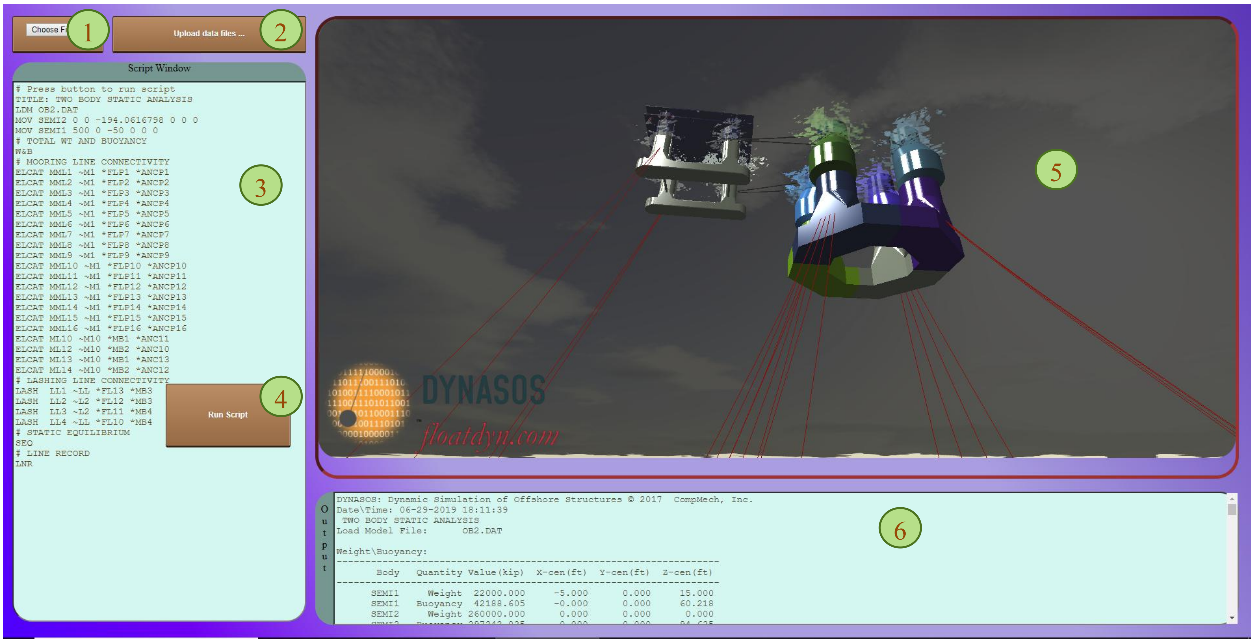
HOW THE WEB APP WORKS



The analysis needs two types of files. One is model files consisting of structural and hydrostatic details of floating or fixed structural units called ‘bodies’ here. IGES files needed to describe hydrostatics of non-skeletal bodies also fall in this category. Another type of file, called script file, contains description of connecting links (mooring lines, lashing lines, and slings), and operations to be performed on bodies and links. Keep both types of files ready on your computer.

Click on button [1] and select one or more model files. Click on button [2] to upload these files to the web server. This step can be repeated multiple times until all the needed files have been uploaded to the server. This operation will take substantial amount of time depending on the internet connectivity.

Copy-paste script commands from the script file to text box [3]. Make sure the script set is correct.

Click button [4]. This will initiate a two-step operation. In the first step, analysis will be performed on the server. In the second step, output will be downloaded to your browser. Both these operations will take substantial amount of time. So have patience.

Once your browser receives output, the final configuration of the model will be shown in window [5] and output will be displayed in text box [6].

SCRIPT COMMANDS

Analysis Title

Title *title_of_the_analysis*

Run script

RnScript *script_file_name*

Script_file_name = Script file name

Load model

LdModel *model_file*

model_file = *Model file*

Elastic catenary (mooring line with one end anchored to ground)

ElCat *moor_id sect_id fairlead_id anchor_id*

moor_id = *Mooring line ID*

sect_id = *Mooring line Properties ID*

fairlead_id = *Fairlead joint ID*

anchor_id = *Anchor joint ID*

Lashing line (between two floating bodies)

Lash *lash_id sect_id joint1_id joint2_id*

lash_id = *Lashing line ID*

sect_id = *Lashing line Properties ID*

joint1_id = *ID of start joint*

joint2_id = *ID of end joint*

Sling line (one end connected to hook)

Sling *diameter elast_mod length wt_per_length joint_id*

diameter (in) = *Diameter of sling*

elast_mod (ksi) = *Elastic modulus of sling*

length (ft) = *Length of sling*

wt_per_length (lb/ft) = *Weight per unit length of sling* *joint_id = ID of padeye joint*

Constraints on degrees of freedom of floating bodies

Fixity *ffffff*

ffffff = 6 digit integer consisting of zeros and ones. One for fixity. Zero for free.

Determine nearest static equilibrium position

SEquil

DynaSOS uses classical Newton's method with exact linearization of unbalanced forces to reach the nearest stable equilibrium state. Please note that a floating body has multiple equilibrium states. For example, a cube has 14 equilibrium states. So it is the user's responsibility to position the body, using Move and/or Place commands, nearest to the desired equilibrium state before using SEquil command. It will also speed up iterative process.

Free flood a compartment

FrFlood *compartment_id*

Vent a compartment

Vent *compartment_id*

Reference joint (used for deference draft calculation)

RfJoint *ref_joint_id*

Event number for load generation

LdEvent *event_number*

Override body weight and CG

Weight *body_id weight gx_x cg_y cg_z*

weight (kip) = body weight override

gx_x, cg_y, cg_z (ft) = CG override in body coordinates

Water depth

WaDepth *water_depth*

Water_depth (ft)

Density of water

DnWater *water_density_in_kip/ft^3*

Move a body by given translations and rotations

Move *body_id dx dy dz rx ry rz*

dx, dy, dz (ft) = displacements

rx, ry, rz (deg) = rotations (Tait-Bryan convention)

Place a body at given coordinates

Place *body_id X Y Z RX RY RZ*

X, Y, Z (ft) = Body position

RX, RY, RZ (deg) = Body orientation (Tait-Bryan convention)

Calculate weight and buoyancy for given configuration

W&B

Flooding sequence

FLD *%begin %end %step*

Upend sequence with a target hook load

HKLoad *target_load step_size*

target_load (kip) = Target hook load

step_size (ft) = Step size for increase or decrease in hook height.

Upend sequence with a target reference draft

RFDraft *draft_value step_size*

draft_value (ft) = Target reference draft

step_size (ft) = Step size for increase or decrease in hook height.

Upend sequence with a target hook height

HkHeight *target_height step_size*

target_height (ft) = Target hook height

step_size (ft) = Step size for increase or decrease in hook height.

Tank Report

***TkR**eport*

Generates tank capacity report for all the bodies.

Links Report

***LnR**eport*

Generates report for link elements connecting bodies.

DATA FILE FORMAT

SetVar *variable = value*

The variable string surrounded by percent symbol (%Variable%) can be used anywhere in the rest of the data file

Section *section_id* $\left\{\begin{array}{c} Tube\ \ od\ \ wt \\ Cone\ \ ods\ \ wt\ \ ode \\ Plate\ \ plate\_thickness \\ Wide\ \ b\ \ h\ \ tw\ \ tf \\ Box\ \ b\ \ h\ \ tw\ \ tf \\ WBox\ \ b\ \ h\ \ twi\ \ tf\ \ two \\ Prismatic\ \ b\ \ h \\ ElCat\ \ wt\_per\_length\left(\frac{kip}{ft}\right)\ \ AE(kip)\ldots \\ selgment\_length(ft)\ clump\_weight(kip) \\ Rolled\ sections\ from\ tables \\ (all\ above\ dimensions\ in\ inches) \end{array}\right\}$ *-dens density(lb/ft³)*

Body *body_id*

All the entities defined after body card will belong to this body until another body is defined.

RlAxis *cx cy cz*

Vector used to define roll for upend analysis. Inclination of this vector will be reported as roll.

PiAxis *cx cy cz*

Vector used to define pitch for upend analysis. Inclination of this vector will be reported as pitch.

Joint *joint_id xc(ft) yc(ft) zc(ft)*

Member *member_id section_id -Flood Yes/No -Zref z_ref_joint*
-Ogs global_offset_at_member_start(in)
-Oge global_offset_at_member_end(in)
-Disr DEAD -Disr DISP -Disr BUOY -Disr WIND

"Disr" flag will disregard dead weight, buoyancy, and wind load or will not display the member.

CylinPart *part_id diameter(in) multiplier x1(ft) y1(ft) z1(ft) x2(ft) y2(ft) z2(ft)*

Definition of cylindrical part of the floating body.

GenPart *part_id iges_file_name multiplier X Y Z θx θy θz*

Definition of the part of the floating body that is defined using an IGES file. Multiplier is just a multiplier, it will not scale the 3d part.

Plate *plate_id plate_section node1_id node2_id node3_id node4_id*

Compartment *comp_id -holes valve1 valve2 ...*

All the CylTank and GenTank defined after this card will be assumed to be part of this compartment.

CylTank *tank_dia(in) x1(ft) y1(ft) z1(ft) x2(ft) y2(ft) z2(ft)*

Cylindrical part of a compartment. All the parts of a compartment are assumed to be connected to each other)

GenTank *iges_file_name permeability(fraction)*

General part of a compartment defined using an IGES file.

Hole *hole_id -point joint_id*

Buoyancy *node_id buoyancy_value(kip)*

Point buoyancy.

Weight *node_id weight_value(kip) rad_gyr_@x(ft) rad_gyr_@y(ft) rad_gyr_@z(ft)*

Point weight.