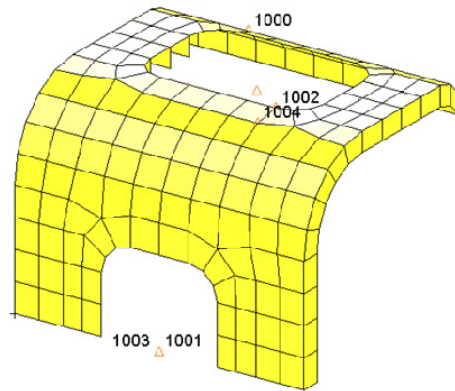


Workshop – Parameter Study, Varying the Location of Concentrated Masses

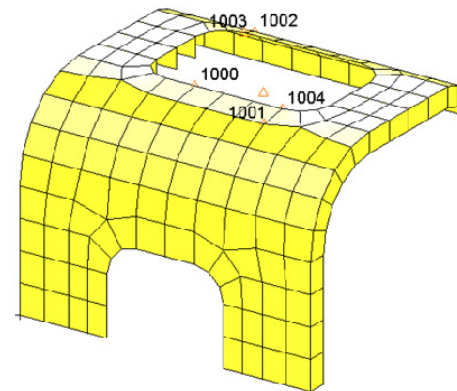
AN MSC NASTRAN MACHINE LEARNING WEB APP TUTORIAL

Goal: Configure multiple MSC Nastran runs

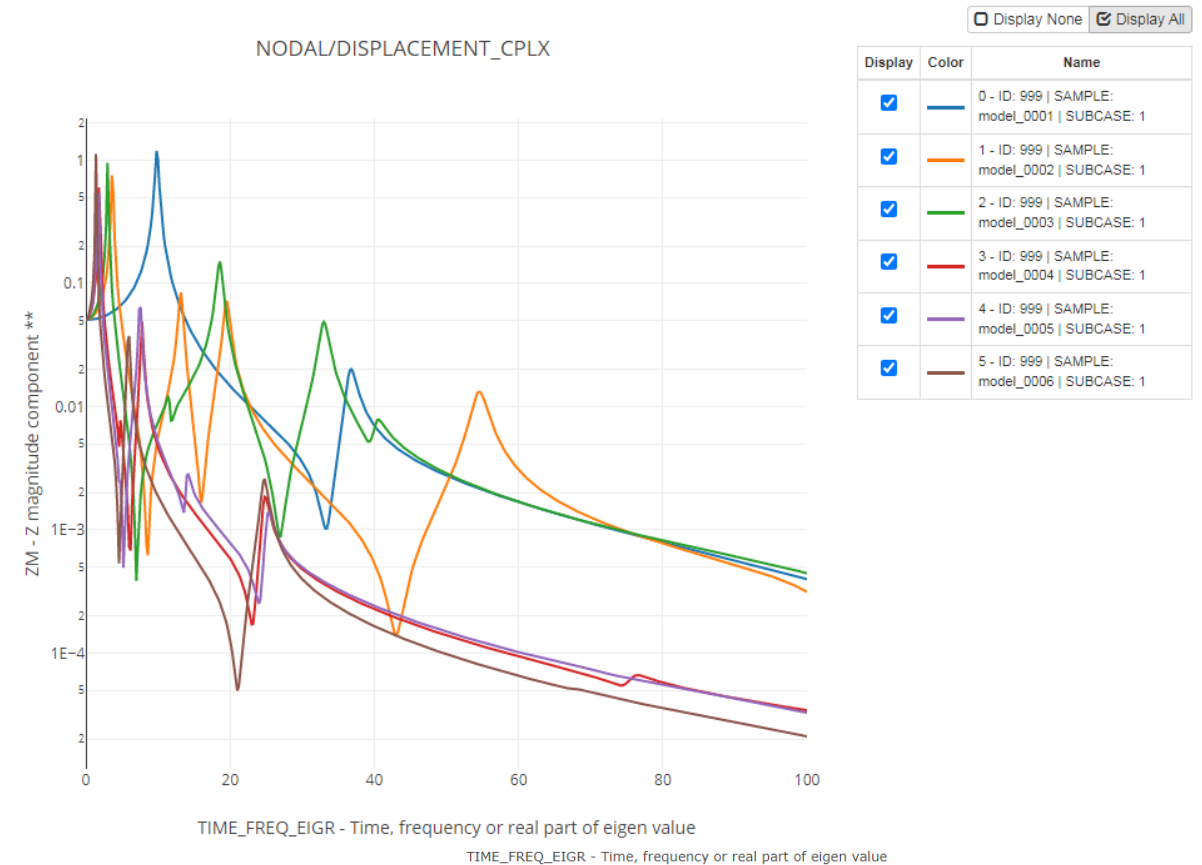
1. Vary the location of 5 concentrated masses on the bracket
2. Configure 6 MSC Nastran runs, each run with a different position for the 5 concentrated masses
3. Plot the displacement response at GRID 999 for all MSC Nastran runs



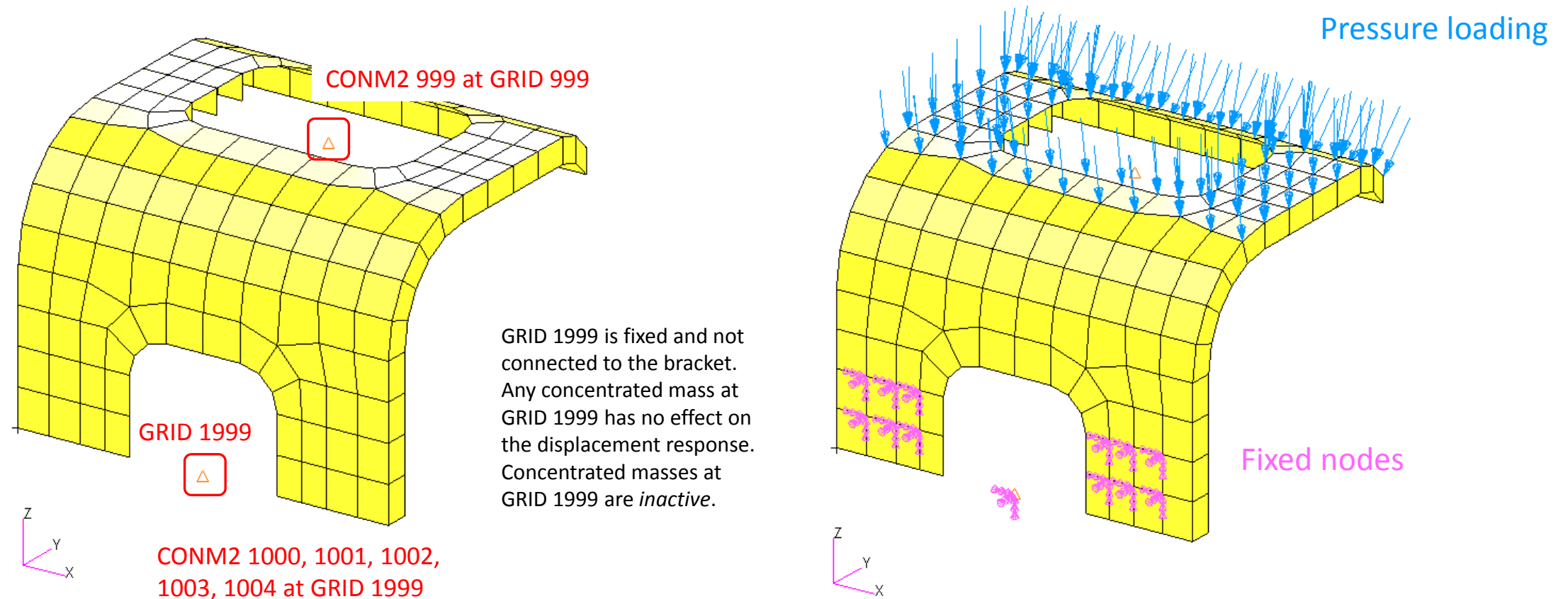
Sample 4 - 3 active CONM2



Sample 6 - 5 active CONM2



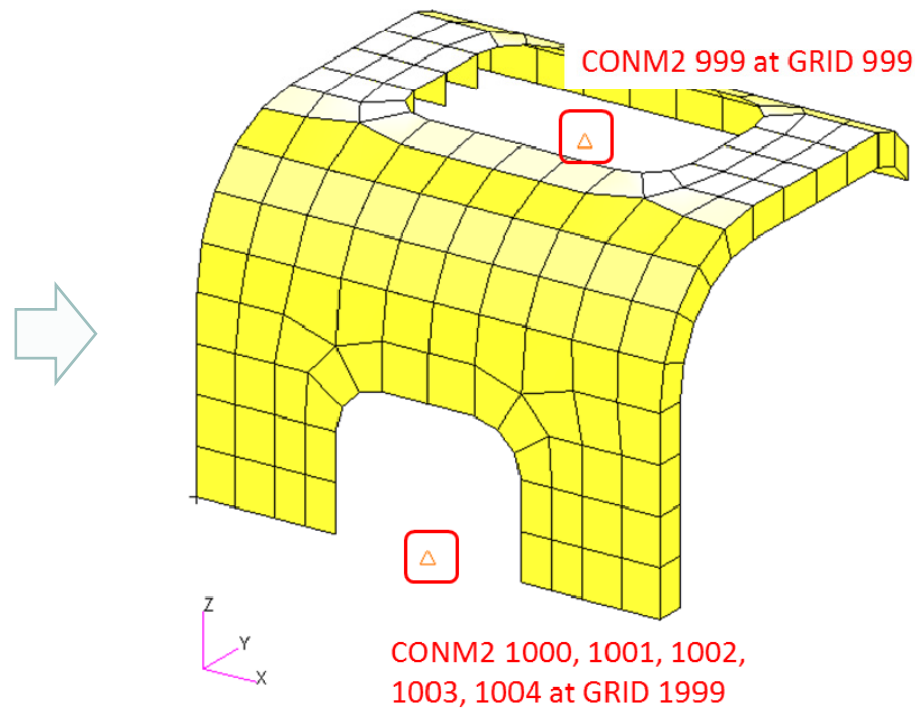
Details of the Structural Model



Problem Statement

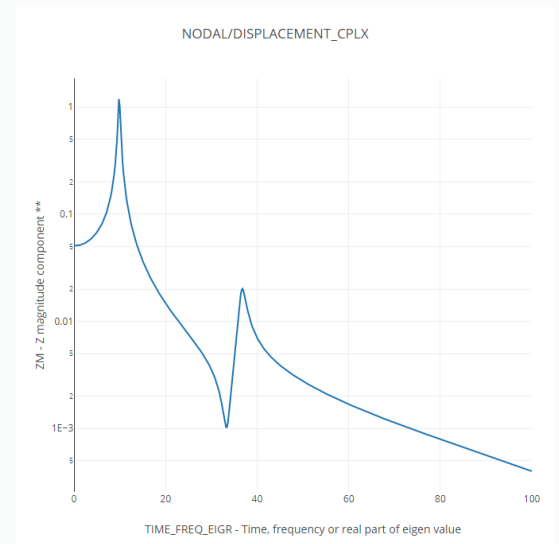
Design Variables

- x1: The grid point identification number (field G) of CONM2 1000
- x2: The grid point identification number (field G) of CONM2 1001
- x3: The grid point identification number (field G) of CONM2 1002
- x4: The grid point identification number (field G) of CONM2 1003
- x5: The grid point identification number (field G) of CONM2 1004



Monitored Responses

r1: Displacement, z component, at GRID 999 for all forcing frequencies



Samples

1. 6 MSC Nastran runs are configured
 - Each value for the parameters corresponds to a different GRID identification number
2. Consider sample 1
 - Parameters, x1, x2, x3, x4, x5 are all set to 19999, i.e. the 5 concentrated masses are placed at GRID 19999. Sample 1 has 5 inactive concentrated masses.
3. Consider sample 2
 - Parameter x1 is set to 95, i.e. CONM2 1000 is placed at GRID 95
 - All other CONM2s are left at GRID 19999, which correspond to parameters x2, x3, x4 and x5. Sample 2 has 1 active concentrated mass and 4 inactive concentrated masses.

			Parameters				
	Sample Number	Status	x1	x2	x3	x4	x5
✖	1	✓	19999	19999	19999	19999	19999
✖	2	✓	95	19999	19999	19999	19999
✖	3	✓	85	19999	19999	19999	82
✖	4	✓	185	19999	95	19999	85
✖	5	✓	195	95	19999	92	85
✖	6	✓	92	85	185	195	95

1

5

10

20


30

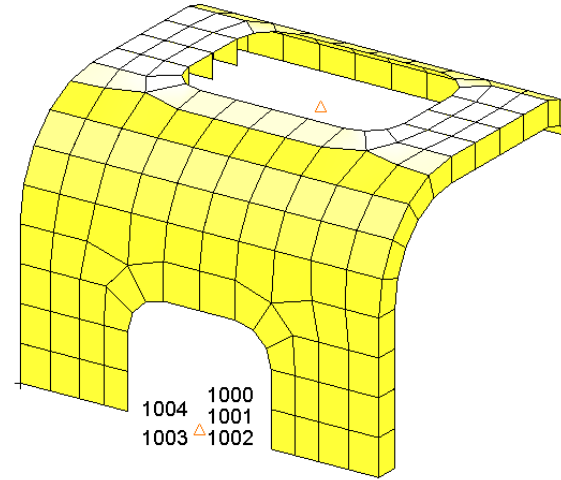
40

50

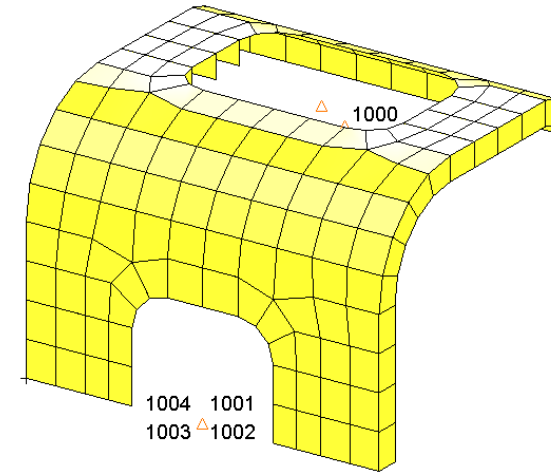
Samples

1. The position of concentrated mass for all 6 samples are displayed
2. Sample 1 is the only sample where all 5 concentrated masses (CONM2 1000, 1001, 1002, 1003, 1004) are placed at the fixed GRID 1999. The 5 concentrated masses are inactive for sample 1. MSC Nastran will run each sample.

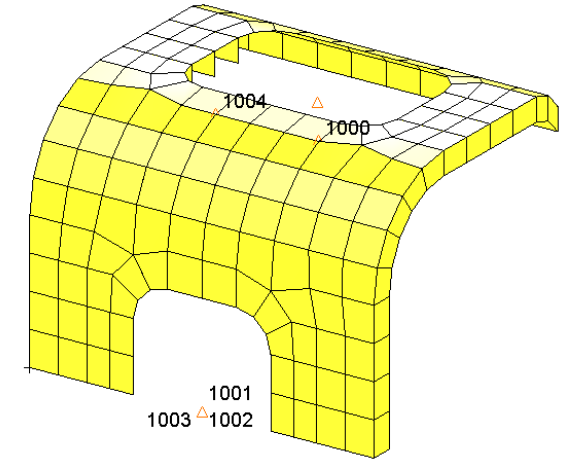
 Concentrated Mass (CONM2)



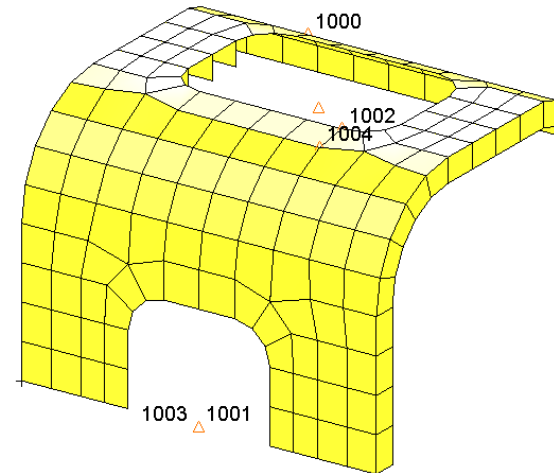
Sample 1 - 0 active CONM2



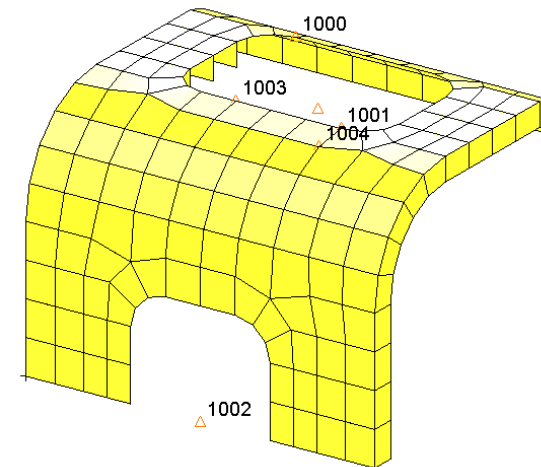
Sample 2 - 1 active CONM2



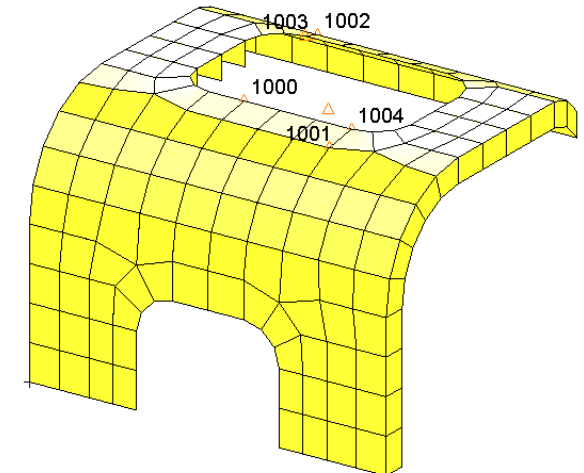
Sample 3 - 2 active CONM2



Sample 4 - 3 active CONM2



Sample 5 - 4 active CONM2

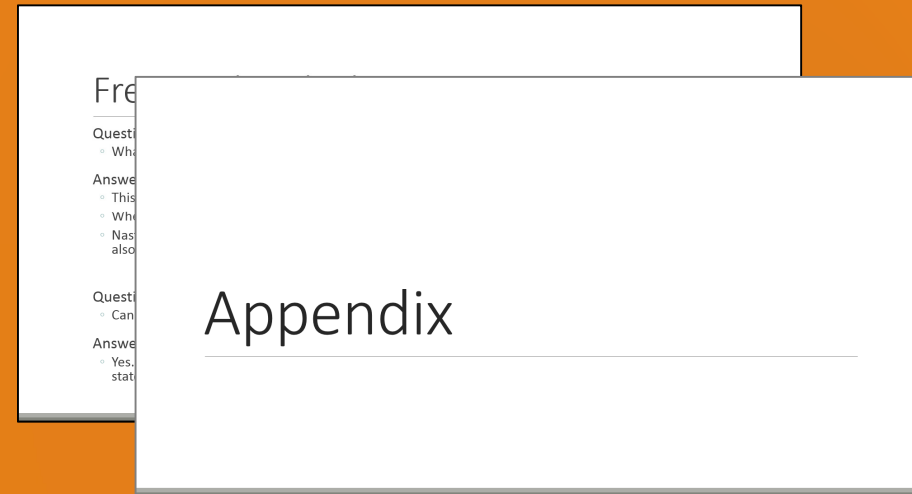


Sample 6 - 5 active CONM2

More Information Available in the Appendix

The Appendix includes information regarding the following:

- Response Configuration
 - Monitor the maximum or minimum response, whichever has the greatest absolute value: Yes, No or blank
- How to import and edit files



Contact me

- Nastran SOL 200 training
- Nastran SOL 200 questions
- Structural or mechanical optimization questions
- Access to the SOL 200 Web App

[christian@ the-engineering-lab.com](mailto:christian@the-engineering-lab.com)

Tutorial

Tutorial Overview

1. Start with a .bdf or .dat file
2. Use the Machine Learning web app to:
 1. Configure the problem statement
 2. Configure multiple batch runs
3. Use the HDF5 Explorer to:
 1. Create response vs. frequency plots

Special Topics Covered

Automatic Response Extraction – Often responses are manually or automatically extracted from the F06 file. This becomes challenging when extracting responses from multiple F06 files. This tutorial highlights the web app's ability to automatically extract responses from multiple H5 files with minimal user effort.

XY Plots – This tutorial focuses on the displacement response generated by a frequency response analysis. XY plots must be created. The HDF5 Explorer is used to automatically generate the XY plots.

SOL 200 Web App Capabilities

The Post-processor Web App and HDF5 Explorer are free to MSC Nastran users.

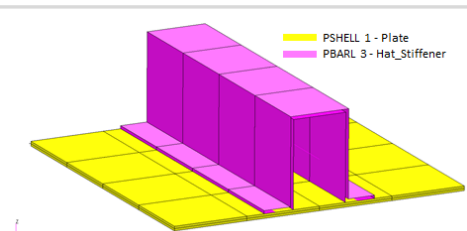
Compatibility

- Google Chrome, Mozilla Firefox or Microsoft Edge
- Windows and Red Hat Linux
- Installable on a company laptop, workstation or server. All data remains within your company.

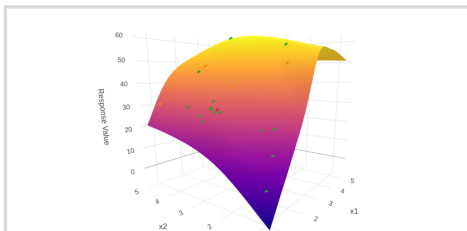
Web Apps

Benefits

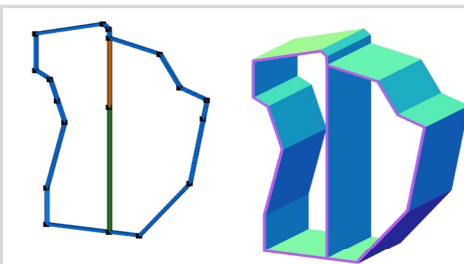
- REAL TIME error detection. 200+ error validations.
- REAL TIME creation of bulk data entries.
- Web browser accessible
- Free Post-processor web apps
- +80 tutorials



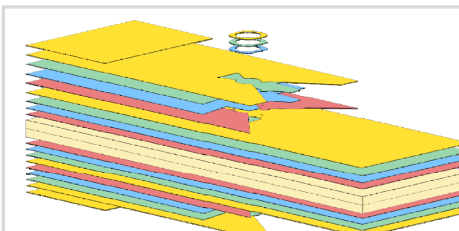
Web Apps for MSC Nastran SOL 200
Pre/post for MSC Nastran SOL 200.
Support for size, topology, topometry, topography, multi-model optimization.



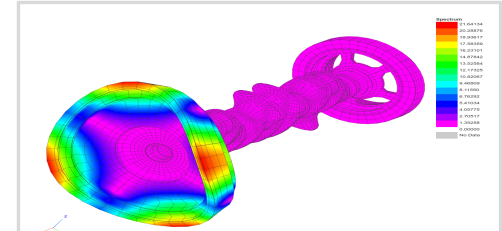
Machine Learning Web App
Bayesian Optimization for nonlinear response optimization (SOL 400)



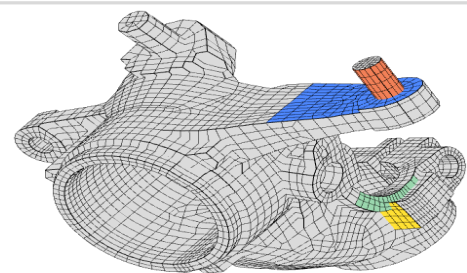
PBMSECT Web App
Generate PBMSECT and PBRSECT entries graphically



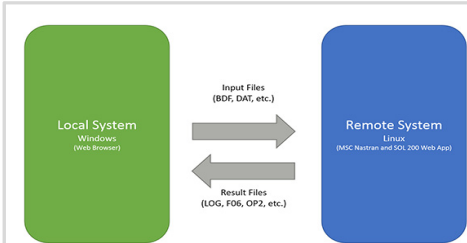
Ply Shape Optimization Web App
Optimize composite ply drop-off locations, and generate new PCOMPG entries



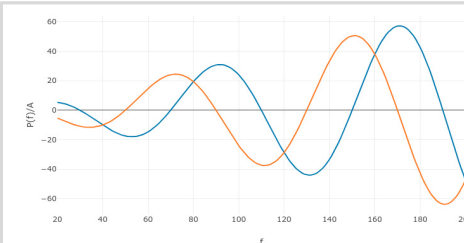
Post-processor Web App
View MSC Nastran results in a web browser on Windows and Linux



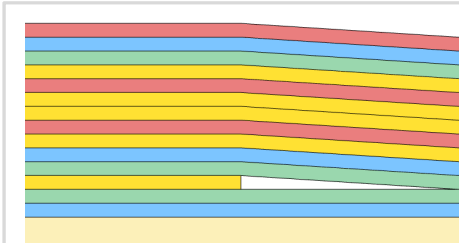
Shape Optimization Web App
Use a web application to configure and perform shape optimization.



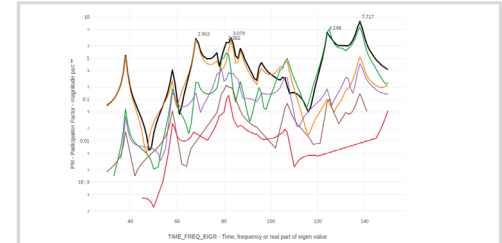
Remote Execution Web App
Run MSC Nastran jobs on remote Linux or Windows systems available on the local network



Dynamic Loads Web App
Generate RLOAD1, RLOAD2 and DLOAD entries graphically



Stacking Sequence Web App
Optimize the stacking sequence of composite laminate plies

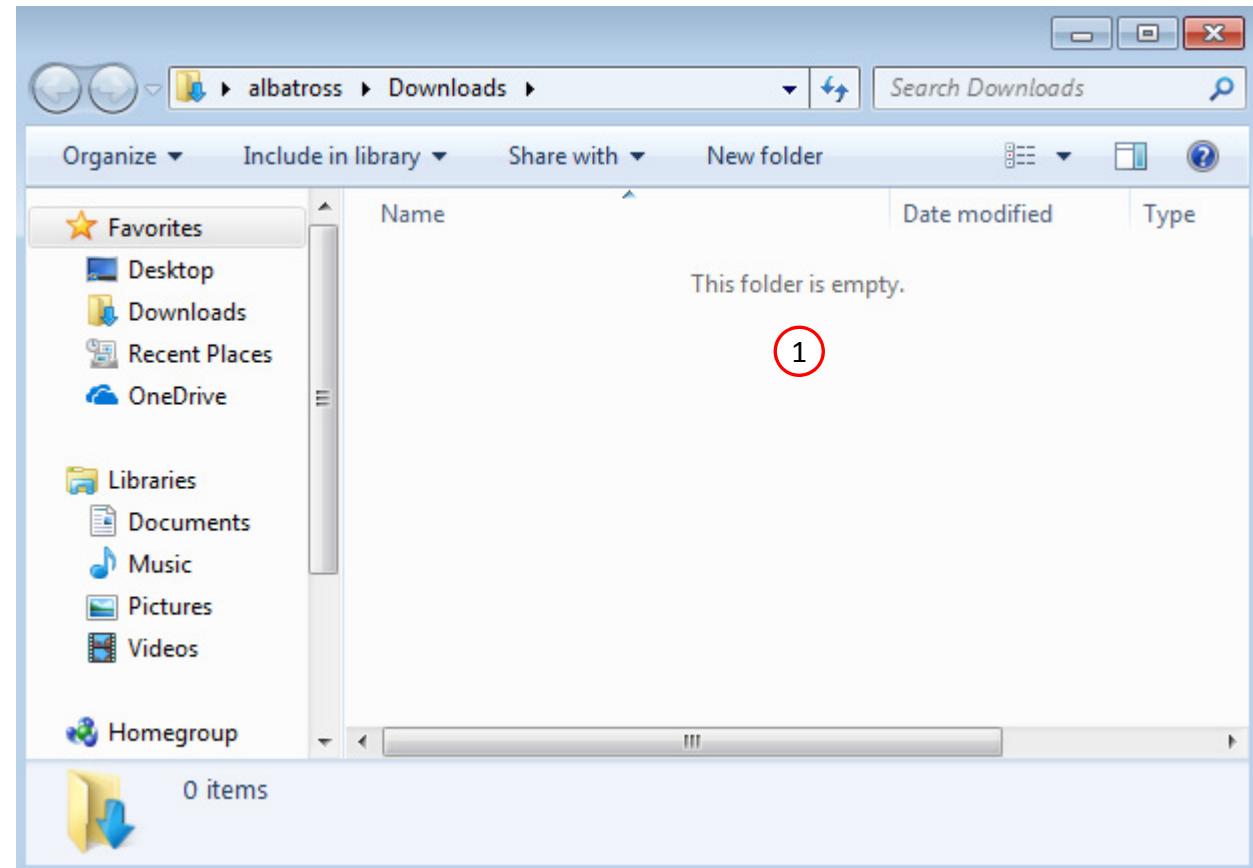


HDF5 Explorer Web App
Create graphs (XY plots) using data from the H5 file

Before Starting

1. Ensure the Downloads directory is empty in order to prevent confusion with other files

- Throughout this workshop, you will be working with multiple file types and directories such as:
 - .bdf/.dat
 - nastran_working_directory
 - .f06, .log, .pch, .h5, etc.
- To minimize confusion with files and folders, it is encouraged to start with a clean directory.



Go to the User's Guide

1. Click on the indicated link

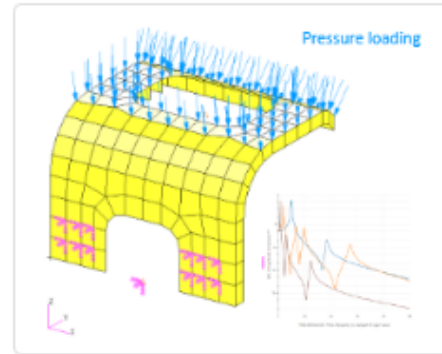
- The necessary BDF files for this tutorial are available in the Tutorials section of the User's Guide.



Obtain Starting Files

1. Find the indicated example
2. Click Link
3. The starting file has been downloaded

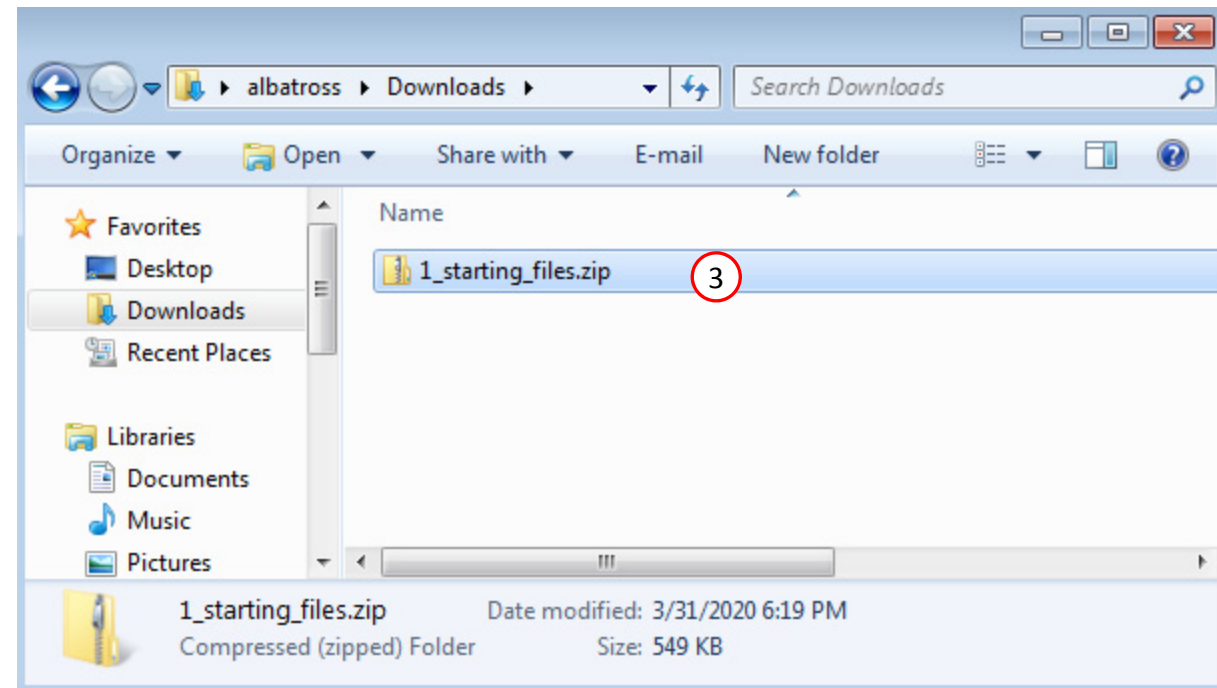
- When starting the procedure, all the necessary BDF, or DAT, files must be collected and uploaded together. Relevant INCLUDE files must also be collected and uploaded.



Parameter Study, Varying the Location of Concentrated Masses ¹

A frequency response analysis is performed on a bracket. The goal in this tutorial is to vary the position of 5 concentrated masses on the bracket and determine the displacement vs. frequency plots for each different configuration of concentrated masses. In total, six MSC Nastran runs are configured, each with a different configuration of the concentrated masses.

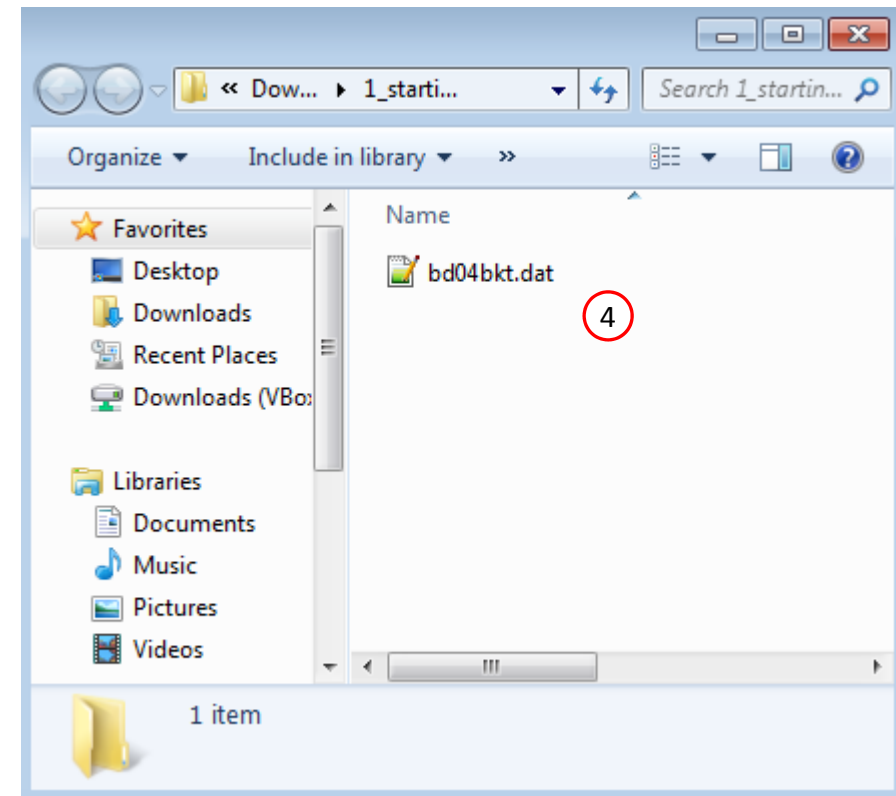
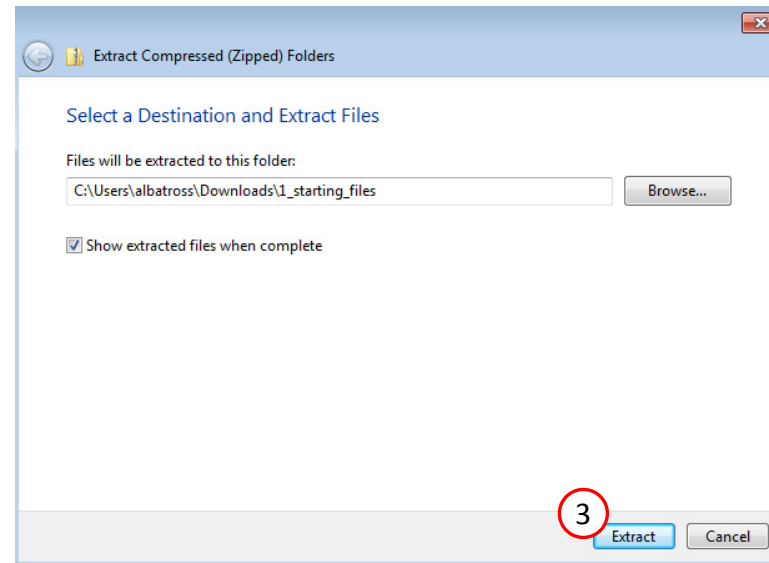
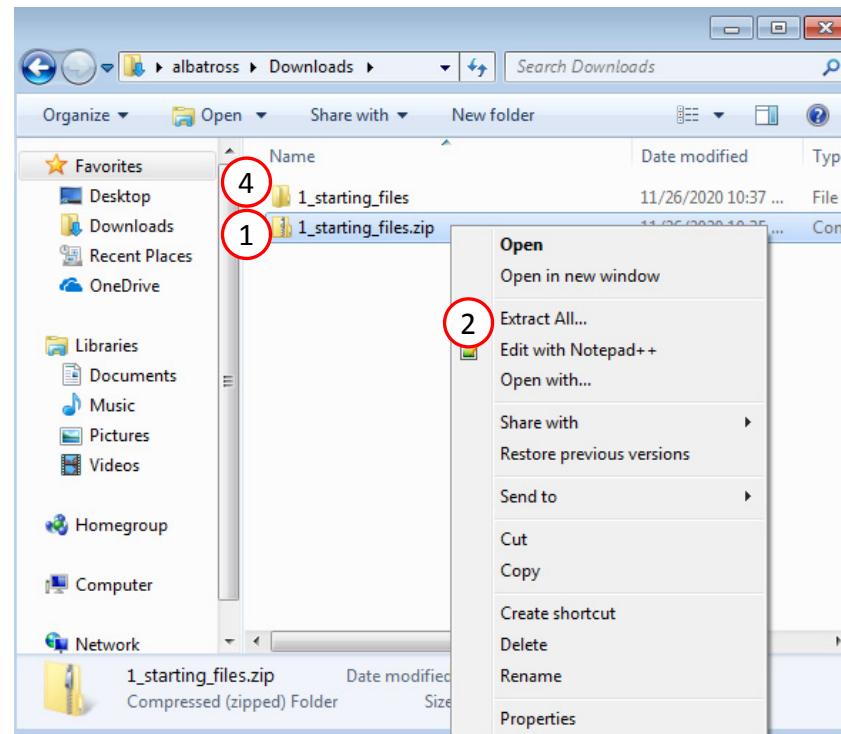
Starting Files: [Link](#)
Solution BDF Files: [Link](#) ²



Obtain Starting Files

1. Right click on the zip file
2. Select Extract All...
3. Click Extract
4. The starting files are now available in a folder

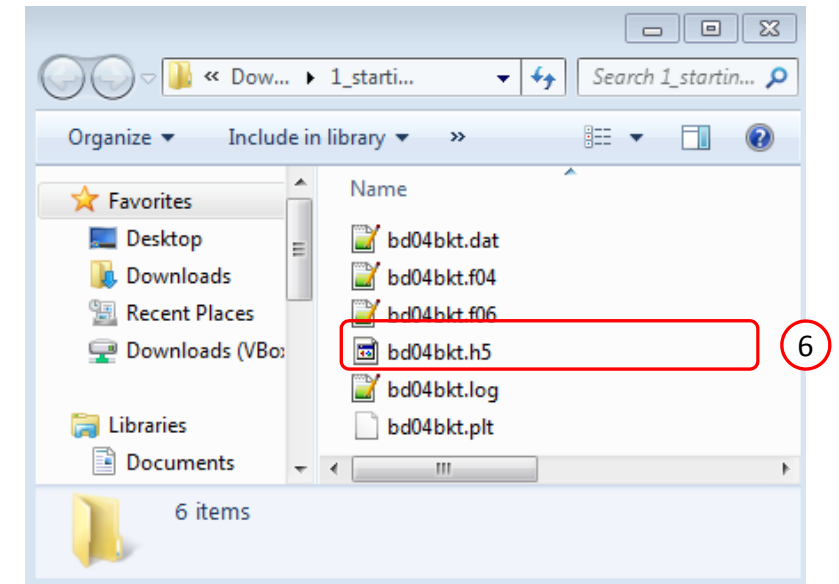
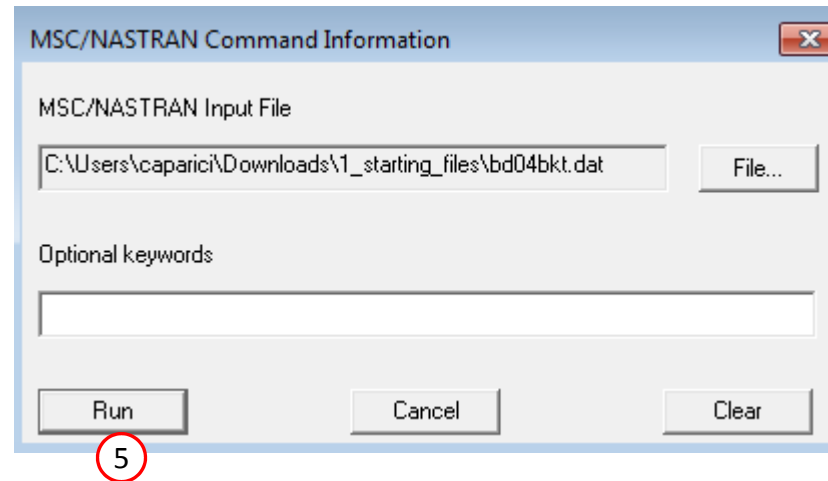
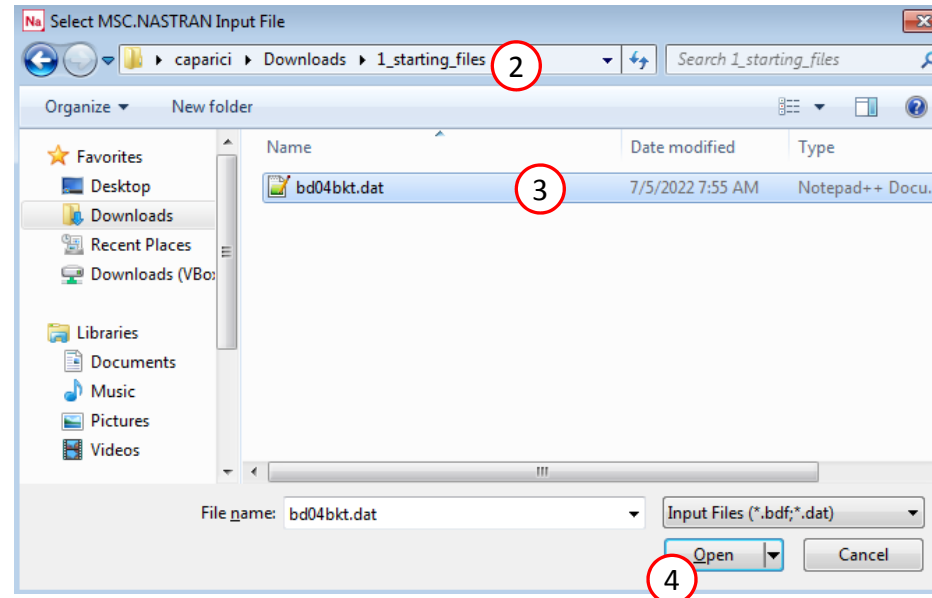
- The starting files for this tutorial are contained in a ZIP file and must be extracted as shown.



Create the Starting H5 File

A starting H5 file must be created. This H5 file will be used to configure the responses later on.

1. Double click the MSC Nastran desktop shortcut
2. Navigate to the directory named 1_starting_files
3. Select the indicated file
4. Click Open
5. Click Run
6. The starting H5 file is created



Use the same MSC Nastran version throughout this exercise

The following applies if you have multiple versions of MSC Nastran installed.

To ensure compatibility, use the same MSC Nastran version throughout this exercise. For example, scenario 1 is OK but scenario 2 is NOT OK.

- Scenario 1 - OK
 - MSC Nastran 2021 is used to create the starting H5 file.
 - MSC Nastran 2021 is used for each run during Machine Learning or Parameter study.
- Scenario 2 – NOT OK
 - MSC Nastran 2018.2 is used to create the starting H5 file.
 - MSC Nastran 2021 is used for each run during Machine Learning or Parameter study.

Using the same MSC Nastran version is critical for consistent response extraction from the H5 file. A response configured for Nastran version X may not match in Nastran version Y, which leads to unsuccessful response extraction from the H5 files. The goal is to make sure all H5 files generated are from the same MSC Nastran version.

Open the Correct Page

1. Click on the indicated link

- MSC Nastran can perform many optimization types. The SOL 200 Web App includes dedicated web apps for the following:
 - Optimization for SOL 200 (Size, Topology, Topometry, Topography, Local Optimization, Sensitivity Analysis and Global Optimization)
 - Multi Model Optimization
 - Machine Learning
- The web app also features the HDF5 Explorer, a web application to extract results from the H5 file type.





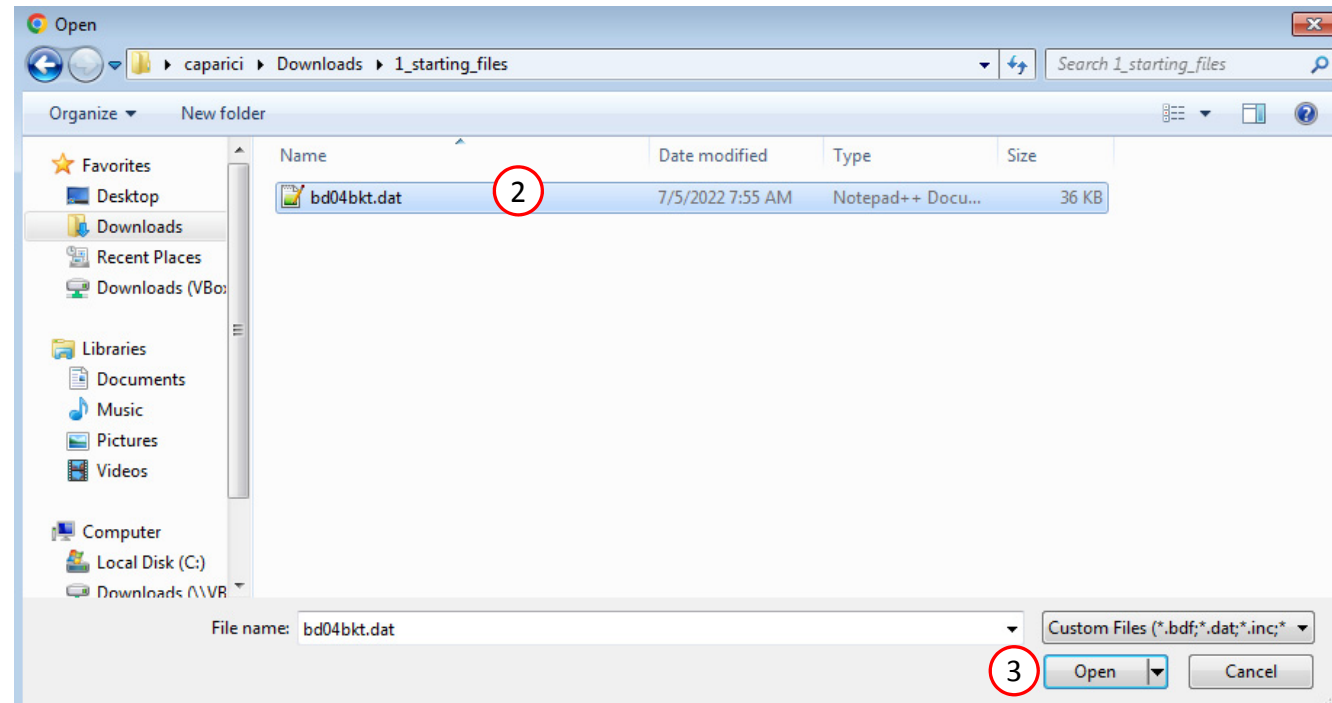
Select BDF Files

1. Select files bd04bkt.dat

Inspecting: 100%

4. Upload files

Uploading: 100 %



Select BDF Files

1. Click Select files
2. Select the indicated files
3. Click Open
4. Click Upload files

- When starting the procedure, all the necessary BDF, or DAT, files must be collected and uploaded together. Relevant INCLUDE files must also be collected and uploaded.

Parameters

- Set the following fields as parameters
 - x1: The grid point identification number (field G) of CONM2 1000
 - x2: The grid point identification number (field G) of CONM2 1001
 - x3: The grid point identification number (field G) of CONM2 1002
 - x4: The grid point identification number (field G) of CONM2 1003
 - x5: The grid point identification number (field G) of CONM2 1004
- A parameter has been created for the selected fields

- Bulk data entries will always be displayed in the small field format.
- Only fields that have real or integer data entries may be selected as parameters. If the field is blank or contains only characters, the field may not be selected.

Select Parameters

\$ _1 _ _2 _ _3 _ _4 _ _5 _				
CONM2	999	999		.0906
+	.35		.56	
CONM2	1000	%x1%		1.0
CONM2	1001	%x2%		1.0
CONM2	1002	%x3%		1.0
CONM2	1003	%x4%		1.0
CONM2	1004	%x5%		1.0
EIGRL	777	-0.1	1000.	
FREQ1	5	0.0	0.2	500
MAT1	1	3.+7	1.153+7	
MDLPRM	HDF5	2		
PLOAD4	1	171	-3.	
PLOAD4	1	172	-3.	
PLOAD4	1	160	-3.	
PLOAD4	1	161	-3.	

Configure Parameters

Delete	Parameter	Status	Input Type	Low	High	Comments
	x1		integer	Low	High	Field 3 of CONM2 10
	x2		integer	Low	High	Field 3 of CONM2 10
	x3		integer	Low	High	Field 3 of CONM2 10
	x4		integer	Low	High	Field 3 of CONM2 10
	x5		integer	Low	High	Field 3 of CONM2 10

Samples

1. Click Samples
2. Click + Options
3. Click Add Sample with Original Parameter Values
4. Click Add Sample 5 times
5. Click 10 on the pagination bar to display at most 10 rows on the table
6. 6 samples have been created

- Each sample is a new configuration of the FE model. MSC Nastran will be run for each sample.

SOL 200 Web App - Machine Learning Parameters **Samples** Responses Download Results Connection Settings Home

1

Configure Samples

Design

User-defined

+ Info

Samples to Run

+ Options 2

4 + Add Sample

3 + Add Sample with Original Parameter Values

CSV Export CSV Import

Export Select files Select a CSV File Import

			Parameters				
	Sample Number	Status	x1	x2	x3	x4	x5
×	1	✓	19999	19999	19999	19999	19999
×	2	✓	95	19999	19999	19999	19999
×	3	✓	85	19999	19999	19999	82
×	4	✓	185	19999	95	19999	85
×	5	✓	195	95	19999	92	85
×	6	✓	92	85	185	195	95

6

5 10 20 30 40 50

5

Samples

1. Update the values to match the table shown

- Parameters x1, x2, ..., x6 correspond to the GRID position of each concentrated mass (CONM2). GRID 19999 is fixed in all 3 directions of translation and rotation. GRID 19999 is not connected to the bracket. Any concentrated mass at GRID 19999 is not contributing to the response of the bracket. Concentrated masses are GRID 19999 are deemed inactive.

			Parameters				
	Sample Number	Status	x1	x2	x3	x4	x5
✖	1	✓	19999	19999	19999	19999	19999
✖	2	✓	95	19999	19999	19999	19999
✖	3	✓	85	19999	19999	19999	82
✖	4	✓	185	19999	95	19999	85
✖	5	✓	195	95	19999	92	85
✖	6	✓	92	85	185	195	95

1

5 10 20 30 40 50

1

Upload .h5 File

2

1. Select files

bd04bkt.h5

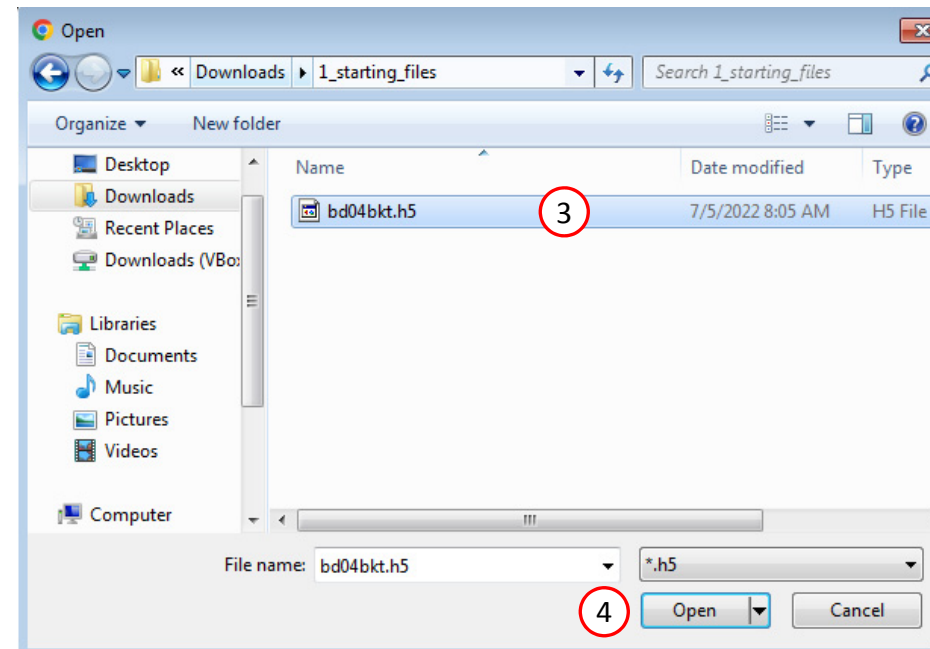
5

2. Upload files

Responses

1. Click Responses
2. Click Select files
3. Select the indicated file
4. Click Open
5. Click Upload files

- On this page, the H5 file is uploaded to the web app.



Adjust the Column Width

- 1. Optional - Use at your liking the buttons at the top right hand corner to adjust the width of the left and right columns

SOL 200 Web App - Machine LearningParametersSamplesResponsesDownloadResultsConnectionSettingsHome

Select Responses to MonitorSession ID: 3710HDF5

Select Dataset

NODAL/ACCELERATION
NODAL/DISPLACEMENT
NODAL/GRID_WEIGHT
NODAL/VELOCITY_CPL
SUMMARY/EIGENVALUE

Acquired Dataset

NODAL/GRID_WEIGHT - 0

Reset Filters

SAMPLE	DOMAIN_ID	SUBCASE	STEP	ANA
--------	-----------	---------	------	-----

View Responses to Monitor

Monitored Responses

Hide/Show ColumnsReset FiltersDownload CSV

Delete	Label	Status	Objective	Lower Bound	Upper Bound	Monitor th of the Fil cycle (SC
	r1			Lower	Upper	

SOL 200 Web App - Machine LearningParametersSamplesResponsesDownloadResultsConnectionSettingsHome

Select Responses to MonitorSession ID: 3710HDF5

Select Dataset

NODAL/ACCELERATION_CPLX
NODAL/DISPLACEMENT_CPLX
NODAL/GRID_WEIGHT
NODAL/VELOCITY_CPLX
SUMMARY/EIGENVALUE

Specify Entities

0

(ID)
Examples: 0, etc.

Acquired Dataset

NODAL/GRID_WEIGHT - 0

Reset Filters

SAMPLE	DOMAIN_ID	SUBCASE	STEP	ANALYSIS	TIME_FREQ_EIGR	
						Im eig ap

lame of H5 File**

model

Subcase number

0

Step number

0

Analysis type

0

Time, frequency or real part of eigen value

0

View Responses to Monitor

Monitored Responses

Hide/Show ColumnsReset FiltersDownload CSV

Delete	Label	Status	Objective	L B
	r1			Lc

510203050100

Select Responses

1. Select the following dataset:
NODAL/DISPLACEMENT_CPLX
2. Use the horizontal scroll bar to find the column ZM
3. Select the indicated cell, a new response r1 is created
4. Ensure Yes is set for column *Monitor the maximum or minimum response, whichever has the greatest absolute value*

- Refer to the Appendix for an explanation on the use of the following:
 - Monitor the maximum or minimum response, whichever has the greatest absolute value*

SOL 200 Web App - Machine Learning Parameters Samples **Responses** Download Results Connection Settings Home

Session ID: 4671 HDF5

Select Responses to Monitor

Select Dataset

NODAL/DISPLACEMENT_CPLX - 999

Specify Entities

999

Grid Identifier (ID)
Examples: 999, etc.

☒ Auto Execute

Acquire Dataset

Acquisition complete and successful

Acquired Dataset

NODAL/DISPLACEMENT_CPLX - 999

	ZM	RXM	RYM
de t **	Z magnitude component **	RX magnitude component **	RY magnitude component **
...	0.05060893...	0.01820559...	2.50296477...
...	0.050...	0.01821287...	2.503195451...
...	0.05069082...	0.01823474...	2.50388825...
...	0.05079357...	0.01827131...	2.50504552...
...	0.05093812...	0.01832276...	2.506671154...
...	0.051125212...	0.01838934...	2.50877068...
...	0.05135577...	0.01847141...	2.511351348...
...	0.05163100...	0.01856936...	2.51442214...
...	0.05195231...	0.01868371...	2.51799397...
...	0.052321411...	0.01881507...	2.52207975...

View Responses to Monitor

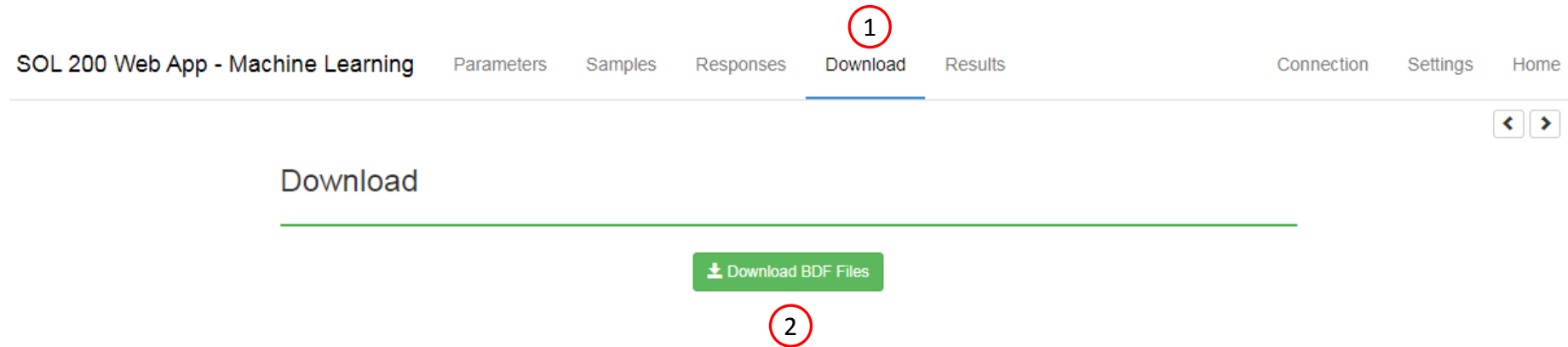
Monitored Responses

Delete	Label	Status	Objective	Lower Bound	Upper Bound	Monitor the response of the FINAL design cycle (SOL 200 only)	Monitor the maximum or minimum response, whichever has the greatest absolute value
	r1			Lower	Upper		Yes - Monitor the maximum response

5 10 20 30 50 100

Download

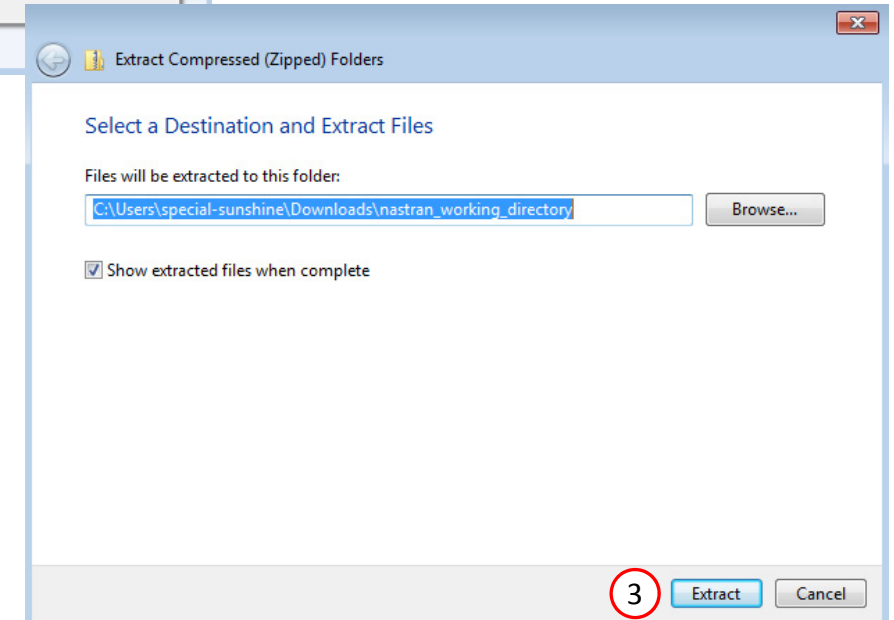
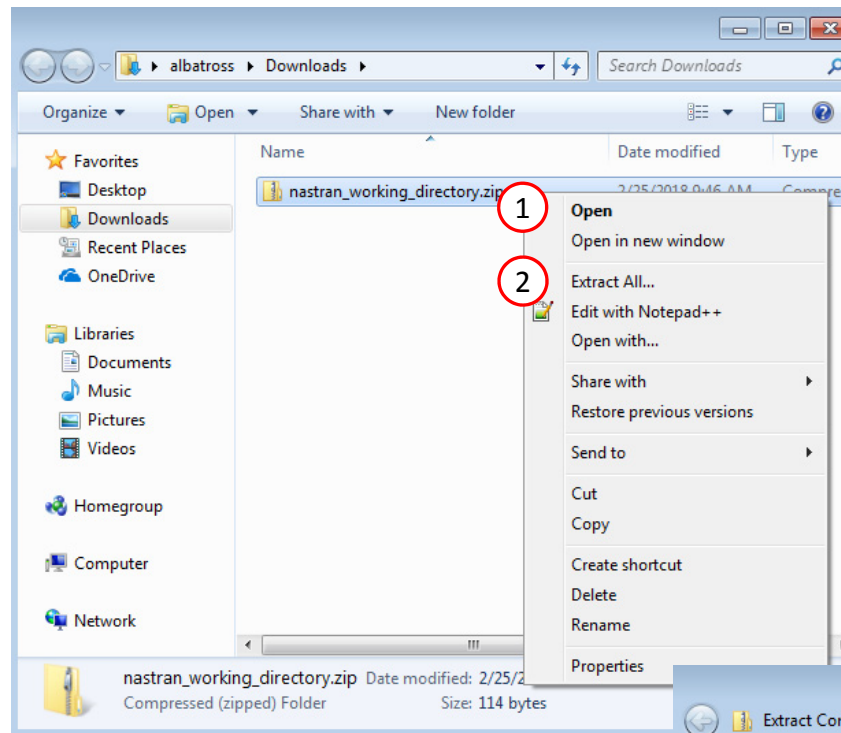
1. Click Download
2. Click Download BDF Files



Start MSC Nastran

1. A new .zip file has been downloaded
2. Right click on the file
3. Click Extract All
4. Click Extract on the following window

- Always extract the contents of the ZIP file to a new, empty folder.



Start MSC Nastran

1. Inside of the new folder, double click on Start Desktop App
2. Click Open, Run or Allow Access on any subsequent windows
3. MSC Nastran will now start

- One can run the Nastran job on a remote machine as follows:
 - 1) Copy the BDF files and the INCLUDE files to a remote machine.
 - 2) Run the MSC Nastran job on the remote machine.
 - 3) After completion, copy the BDF, F06, LOG, H5 files to the local machine.
 - 4) Click "Start MSC Nastran" to display the results.

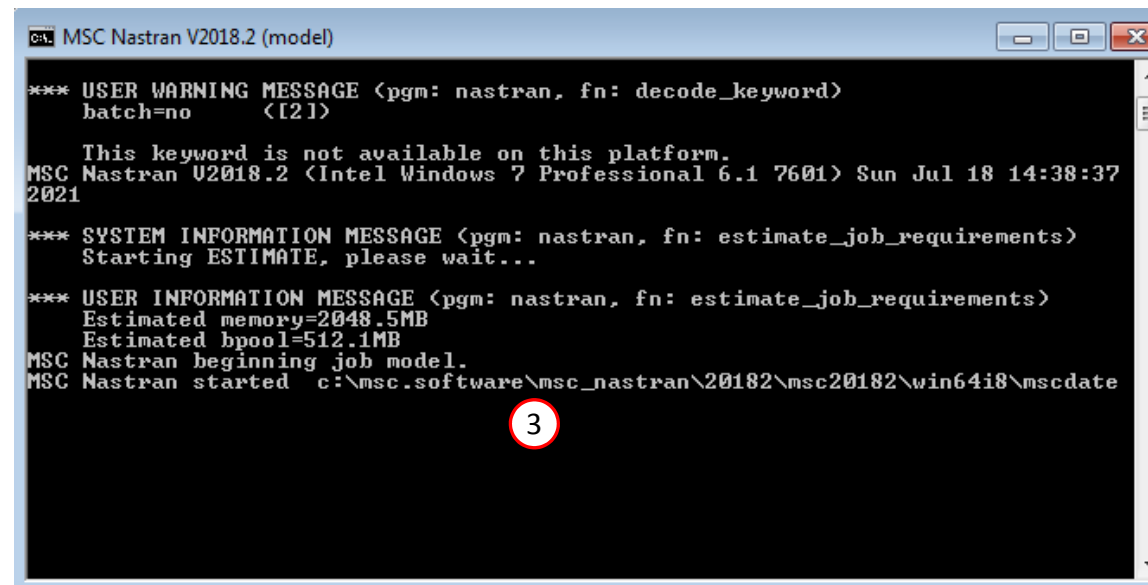
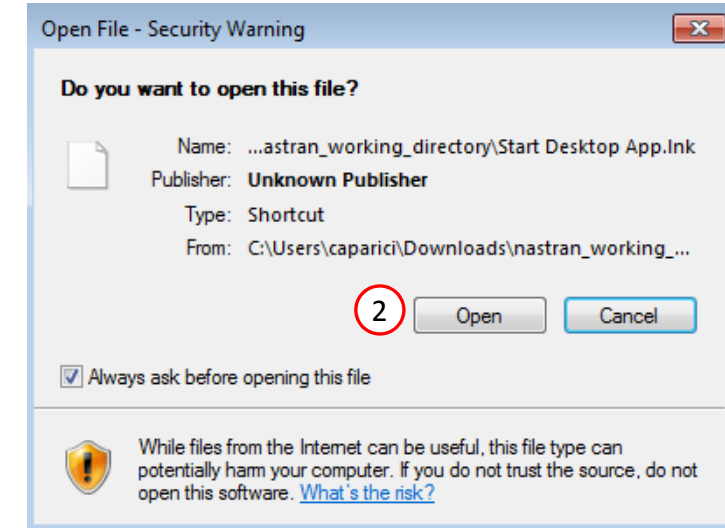
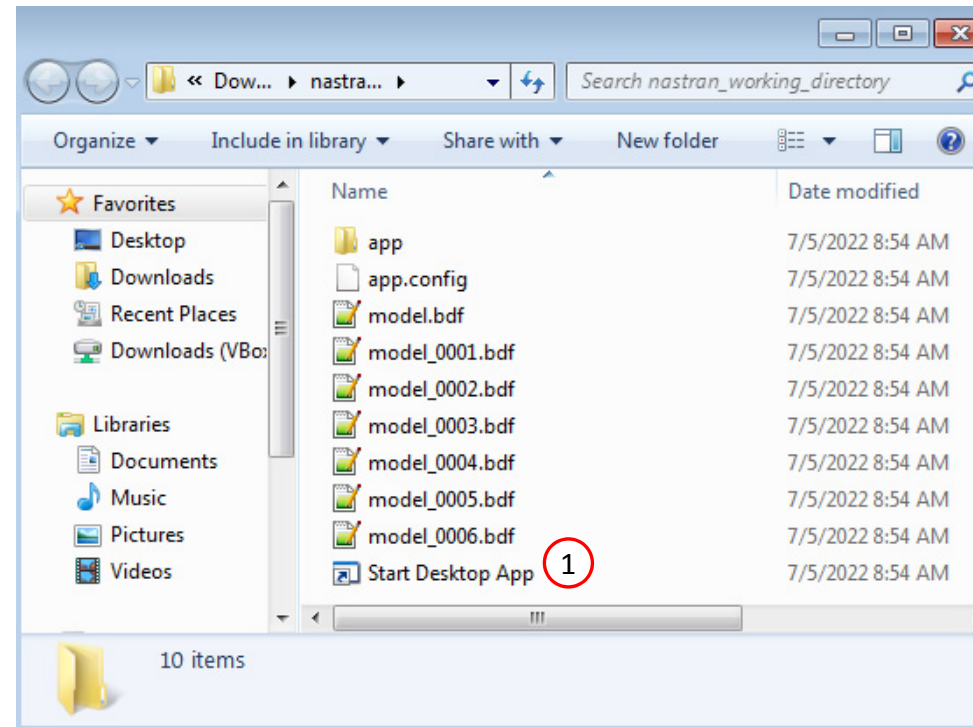
Using Linux?

Follow these instructions:

- 1) Open Terminal
- 2) Navigate to the nastran_working_directory
`cd ./nastran_working_directory`
- 3) Use this command to start the process
`./Start_MSC_Nastran.sh`

In some instances, execute permission must be granted to the directory. Use this command. This command assumes you are one folder level up.

```
sudo chmod -R u+x ./nastran_working_directory
```



Status

- While MSC Nastran is running, a status page will show the current state of MSC Nastran

SOL 200 Web App - Status

 Python

 MSC Nastran

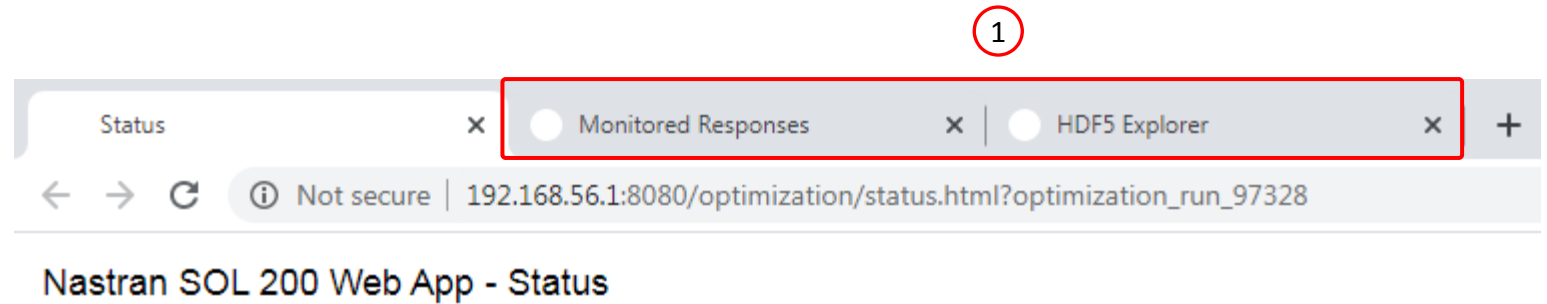
Status

Name	Status of Job	Design Cycle	RUN TERMINATED DUE TO
model.bdf	Running	None	

Results

After each MSC Nastran analysis is complete, multiple web apps are automatically opened to display the results.

1. Use the tabs to switch between each web app
2. A description of each web app is given in the table.



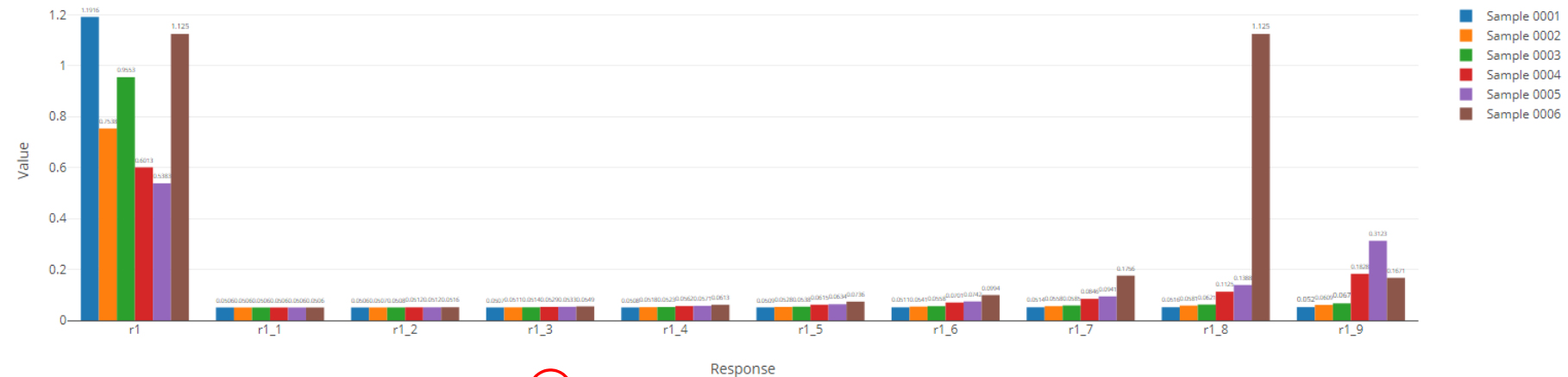
2

Name of Web App	Purpose	Description
Monitored Responses	<ul style="list-style-type: none">The response value from each sample can be compared.	<ul style="list-style-type: none">After each MSC Nastran analysis, the response values are extracted from the H5 file and contained in a file named <code>app_monitored_responses.csv</code>. The Monitored Responses web app is used to create a bar chart of the values contained in this CSV file.
HDF5 Explorer	<ul style="list-style-type: none">This web app is used to probe each H5 file and generate XY plots.	

Review Results

1. The Monitored Responses web app is opened
2. The r1 response corresponds to the maximum displacement at GRID 999 across all forcing frequencies

- A. The table titled Monitored Response can be interacted with. Each column in the table contains filters. Once a filter is modified, the Bar Chart will instantly update.
- B. Additional functions include the ability to highlight the MAX and MIN bars, download a CSV file and reset the filters.



Monitored Responses

Display MAX and MIN Download CSV Reset Filters

Label	Dataset Name	Field	Field Description	Current Value
r1	NODAL/DISPLACEMENT_CPLX	ZM	Z magnitude component **	0.050608935364
r1_1	NODAL/DISPLACEMENT_CPLX	ZM	Z magnitude component **	0.050608935364
r1_2	NODAL/DISPLACEMENT_CPLX	ZM	Z magnitude component **	0.050629383090
r1_3	NODAL/DISPLACEMENT_CPLX	ZM	Z magnitude component **	0.050690827070
r1_4	NODAL/DISPLACEMENT_CPLX	ZM	Z magnitude component **	0.050793570946
r1_5	NODAL/DISPLACEMENT_CPLX	ZM	Z magnitude component **	0.050938124974
r1_6	NODAL/DISPLACEMENT_CPLX	ZM	Z magnitude component **	0.051125212385
r1_7	NODAL/DISPLACEMENT_CPLX	ZM	Z magnitude component **	0.051355778516
r1_8	NODAL/DISPLACEMENT_CPLX	ZM	Z magnitude component **	0.051631002907
r1_9	NODAL/DISPLACEMENT_CPLX	ZM	Z magnitude component **	0.051952314661

« 1 2 3 4 5 6 7 ... 51 »

5 10 20 30 50 100

Monitored Responses from Each Sample

0001	0002	0003	0004	0005
1.1916060448515353	0.7537704266123554	0.9552510468587065	0.6012526173004038	0.5382510468587065
0.05060893536426272	0.05060893536426272	0.05060893536426272	0.05060893536426272	0.05060893536426272
0.050629383090729015	0.05073945513045424	0.050794315229207895	0.05117156823252348	0.05124974652464
0.05069082707001812	0.051135648713305316	0.05136025379389051	0.05294026806581755	0.0532794652464
0.05079357094684524	0.05181184014377652	0.05233747759685566	0.056188347103022576	0.057069124974652464
0.050938124974652464	0.052793376556925	0.05378197382281801	0.061498558494454895	0.0634447785168971
0.05112521238574228	0.05411911424083467	0.05578352166033682	0.07007347328429885	0.0742371002907274196
0.0513557785168971	0.05584553298102757	0.05848101917086541	0.08462317270969963	0.09410931002907274196
0.051631002907274196	0.0580533467085918	0.06208998527967659	0.11252435151143514	0.13881852314661253156
0.051952314661253156	0.06085818552001885	0.0669537699998354	0.18277865844766644	0.31232314661253156

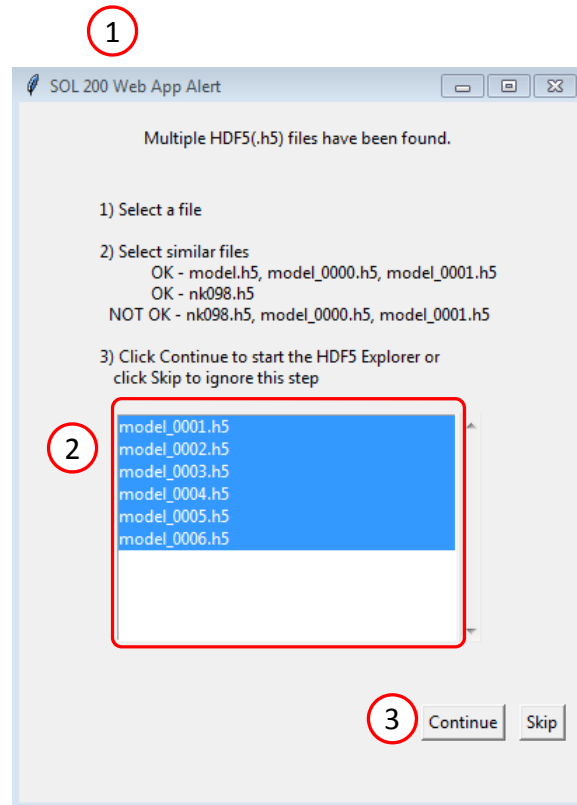
« »

Review Results

1. A new window is opened
2. Select all 6 H5 files
3. Click Continue
4. The HDF5 Explorer is automatically opened.
5. Click the indicate image

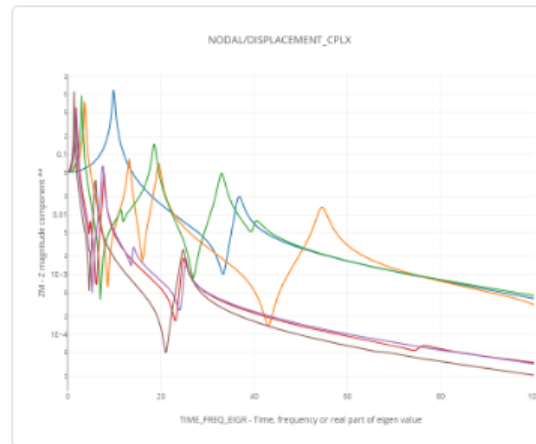
The HDF5 Explorer is broken into sections.

- Acquire Dataset – Specific datasets from the H5 file can be extracted in this section.
- Plots Browser – Use this section to navigate every plot created.
- Combine Plots – This section allows you to combine multiple plots. For example, you can create Load vs. Displacement plots in this section.
- Last Plot Added – The Acquire Dataset section has a button titled “Create Plot.” This button, when clicked, creates a new plot. When the link “Last Plot Added” is clicked, the new plot is displayed.

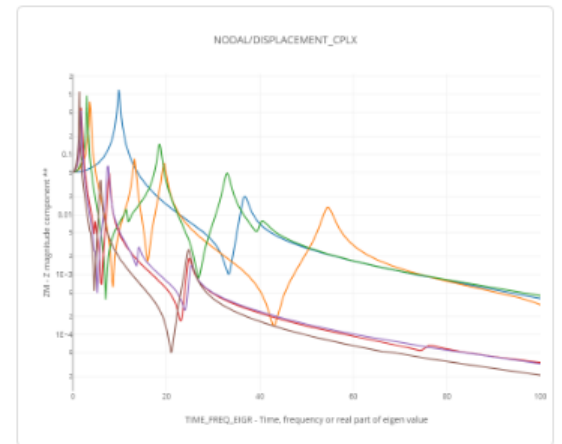


Plots Browser

NODAL/DISPLACEMENT_CPLX 5



Plot #: 1 - ID: 999 | SAMPLE: model_0001, model_0002, model_0003, ... | SUBCASE: 1 | ZM vs. TIME_FREQ_EIGR



Plot #: 2 - ID: 999 | SAMPLE: model_0001, model_0002, model_0003, ... | SUBCASE: 1 | ZM vs. TIME_FREQ_EIGR

Plot - NODAL/DISPLACEMENT_CPLX - Plot #: 1 - ID: 999 | SAMPLE: model_0001, model_0002, model_0003, ... | SUBCASE: 1 | ZM vs. TIME_FREQ_EIGR



Vertical Axis



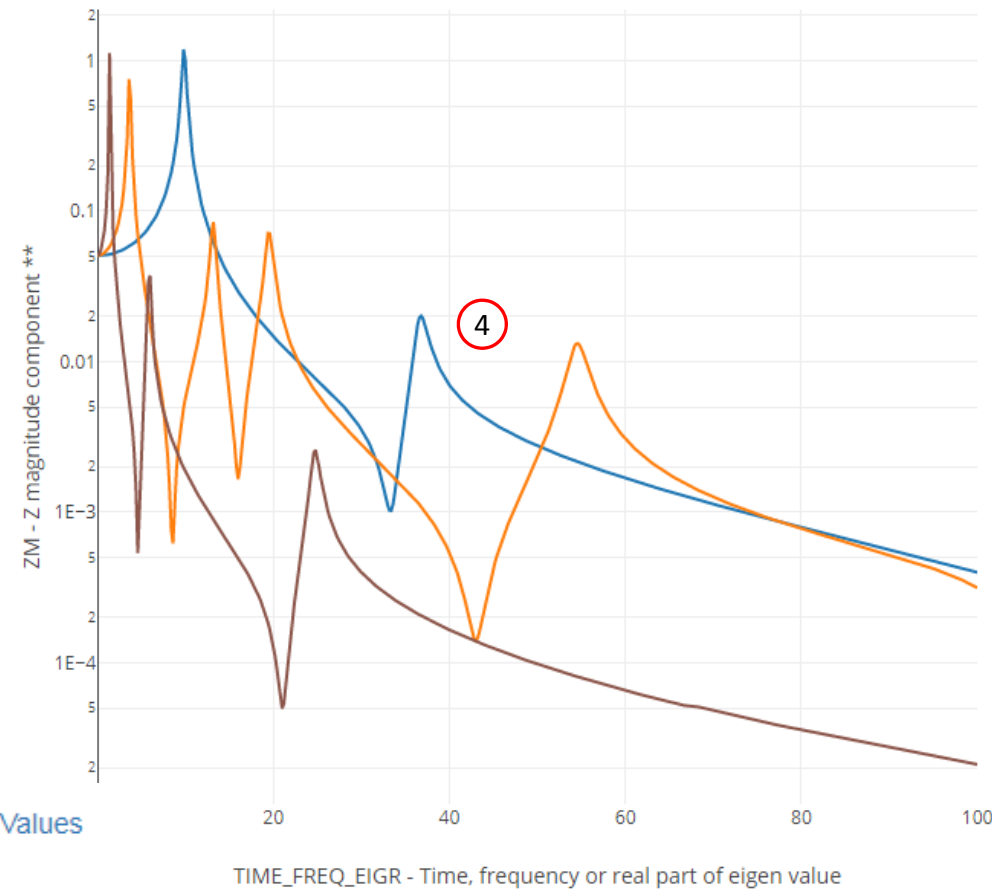
ZM - Z magnitude comp

Horizontal Axis

TIME_FREQ_EIGR - Ti

[+ Options](#)

NODAL/DISPLACEMENT_CPLX

[+ View Filters and Plotted Values](#)☐ Display None ☒ Display All

Display	Color	Name
<input checked="" type="checkbox"/>	Blue	0 - ID: 999 SAMPLE: model_0001 SUBCASE: 1
<input checked="" type="checkbox"/>	Orange	1 - ID: 999 SAMPLE: model_0002 SUBCASE: 1
<input type="checkbox"/>	Green	2 - ID: 999 SAMPLE: model_0003 SUBCASE: 1
<input type="checkbox"/>	Red	3 - ID: 999 SAMPLE: model_0004 SUBCASE: 1
<input type="checkbox"/>	Purple	4 - ID: 999 SAMPLE: model_0005 SUBCASE: 1
<input checked="" type="checkbox"/>	Brown	5 - ID: 999 SAMPLE: model_0006 SUBCASE: 1

Review Results

1. A Displacement vs Frequency plot is displayed
2. Click Display None
3. Mark any checkbox in the Display column to turn plots on and off
4. Each plot is the response at GRID 999 for each sample

End of Tutorial

Appendix

Appendix Contents

- Response Configuration
 - Monitor the maximum or minimum response, whichever has the greatest absolute value: Yes, No or blank
- How to import and edit previous files
- What is Gaussian Process Regression?

Response Configuration

During this tutorial, this option was used:

- Monitor the maximum or minimum response, whichever has the greatest absolute value : Yes

Suppose response r99 is configured for 10 seconds and corresponds to point A on the plot. When Yes is used for the option, the response furthest from the horizontal axis is monitored. In this example, points B and C are furthest from the horizontal axis. Since point B is furthest from the horizontal axis, a value of -15000.0 is monitored.

View Responses to Monitor

Monitored Responses

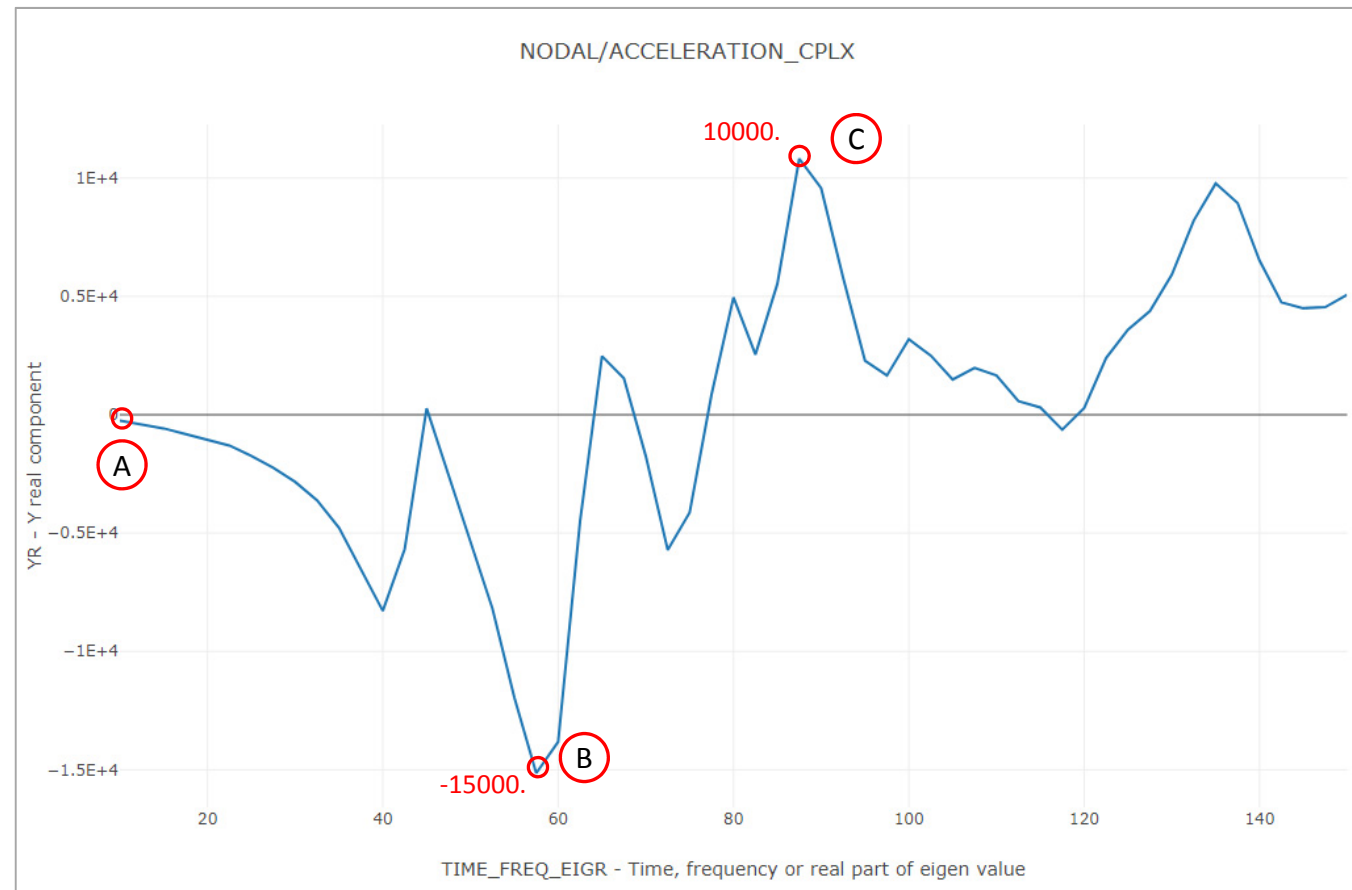
Delete	Label	Status	Objective	Lower Bound	Upper Bound	Monitor the response of the FINAL design cycle (SOL 200 only)	Monitor the maximum or minimum response, whichever has the greatest absolute value
	r99		<input type="text"/>	Lower	Upper	<input type="text"/>	Yes - Monitor the maximum respon

Monitor the maximum or minimum response, whichever has the greatest absolute value

Yes - Monitor the maximum respon

Hide/Show Columns Reset Filters Download CSV

Current Value	ID	SUBCASE	STEP	ANALYSIS
1443.476297324485	1001	12	0	5



How to import and edit previous files

How to import and edit previous files

The parameters, samples and responses are contained in the following files

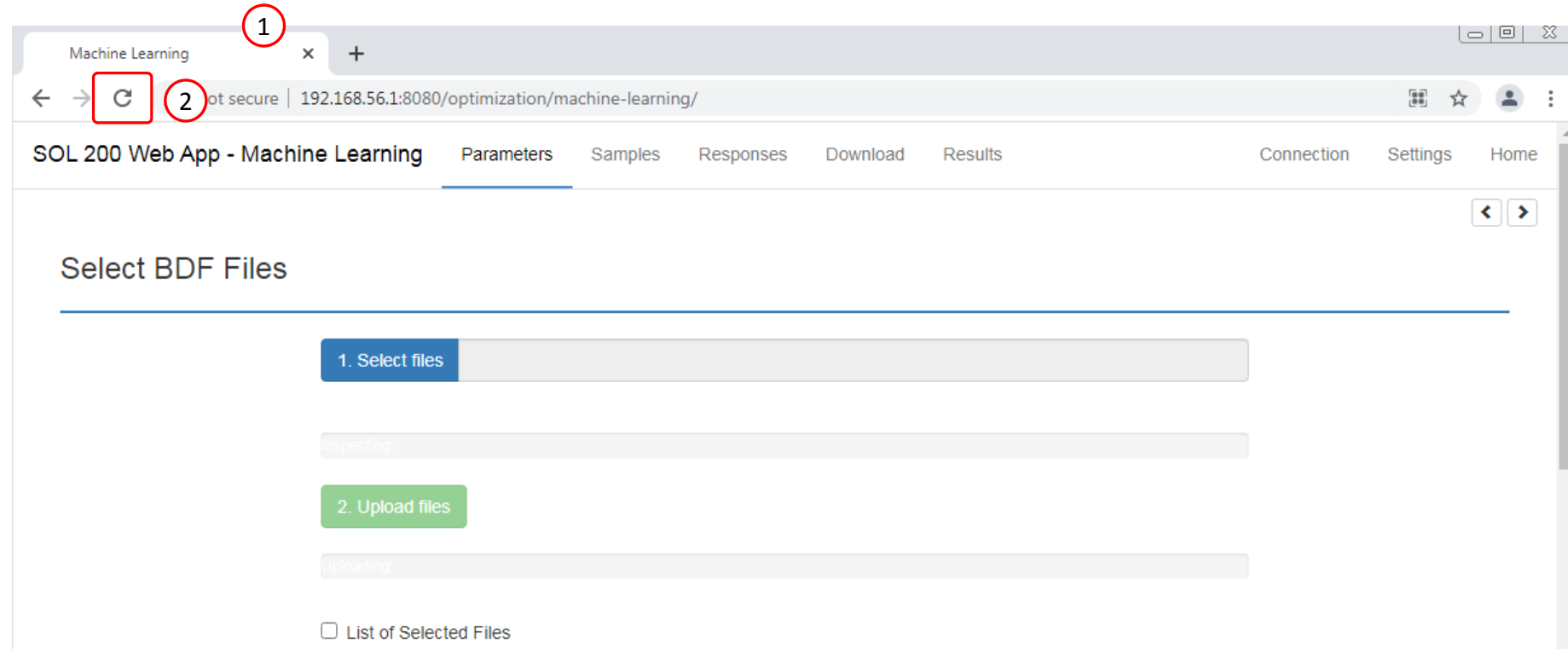
- app.config
- BDF files

These files may be imported back to the Machine Learning web app, and any parameters, samples and responses can be reconfigured

Import

1. Return to the window or tab that has the Machine Learning web app opened
2. Refresh the web page to start a new session

- Refreshing the page is only required when the *Select files* button is disabled.



Import

1. Click Select Files
2. Navigate to the folder named nastran_working_directory
3. Select all the BDF files AND the app.config file.
4. Click Open
5. Click Upload files

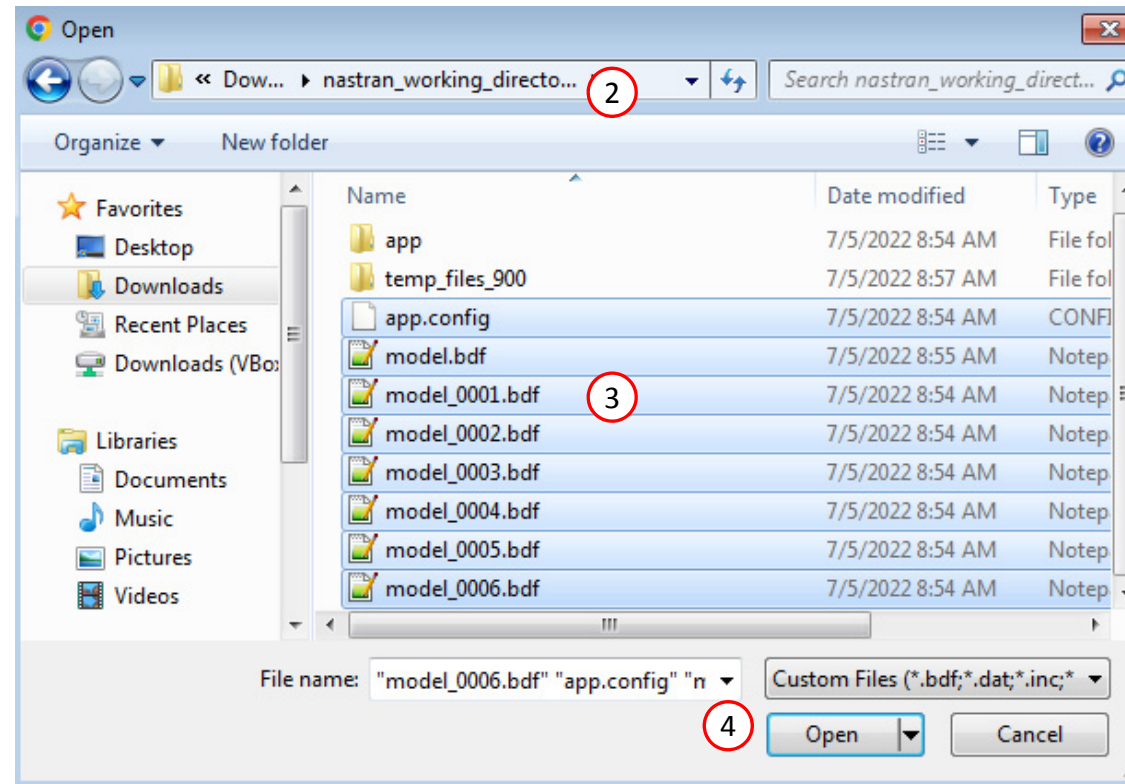
- All imports require the app.config file to be selected.

Select BDF Files

1. Select files 2 files selected

Inspecting: 100%

5. Upload files



Import

For the Response section, the H5 file will need to be re-uploaded.

1. Click Responses
2. Select the H5 file
3. Click Upload
4. Data from the H5 is loaded and ready to use

SOL 200 Web App - Machine Learning Parameters Samples **Responses** Download Results Connection Settings Home

Upload .h5 File

1. Select files bd04bkt.h5

2. Upload files

Select Responses to Monitor Session ID: 7860

Monitored Responses

Delete	Label	Status	Objective	Lower Bound	Upper Bound	Monitor the response of the FINAL design cycle (SOL 200 only)	Monitor the maximum response, with greatest magnitude
	r1			Lower	Upper		Yes - Monitor the maximum response, with greatest magnitude

5 10 20 30 50 100

SOL 200 Web App - Machine Learning Parameters Samples **Responses** Download Results Connection Settings Home

Select Responses to Monitor Session ID: 3972

Select Dataset

Acquired Dataset

Specify Entities

1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12

Auto Execute

Acquire Dataset

Acquisition complete and successful

Monitored Responses

Delete	Label	Status	Objective	Lower Bound	Upper Bound	Monitor the response of the FINAL design cycle (SOL 200 only)	Monitor the maximum response, with greatest magnitude
	r1			Lower	Upper		Yes - Monitor the maximum response, with greatest magnitude

5 10 20 30 50 100

Import

After import, any Parameter, Samples or Responses can be modified.

Select BDF Files

1. Select files 2 files selected

Inspecting: 100%

2. Upload files

Uploading: 100 %

☐ List of Selected Files

Select Parameters

\$ _1 _ _2 _ _3 _ _4 _ _5 _ _6 _ _7 _ _8 _ _9 _ _10 _									
CONM2	999	999		.0906					+
+	.35		.56			.07			
CONM2	1000	%x1%		1.0					
CONM2	1001	%x2%		1.0					
CONM2	1002	%x3%		1.0					
CONM2	1003	%x4%		1.0					
CONM2	1004	%x5%		1.0					
EIGRL	777	-0.1	1000.						
FREQ1	5	0.0	0.2	500					
MAT1	1	3.+7	1.153+7			7.76-4			
MDLPRM	HDF5	2							
PLOAD4	1	171	-3.						
PLOAD4	1	172	-3.						
PLOAD4	1	160	-3.						
PLOAD4	1	161	-3.						
PLOAD4	1	162	-3.						



Configure Parameters

Delete	Parameter	Status	Input Type	Low	High	Comments
	x1		integer	Low	High	Field 3 of CONV
	x2		integer	Low	High	Field 3 of CONV
	x3		integer	Low	High	Field 3 of CONV
	x4		integer	Low	High	Field 3 of CONV
	x5		integer	Low	High	Field 3 of CONV