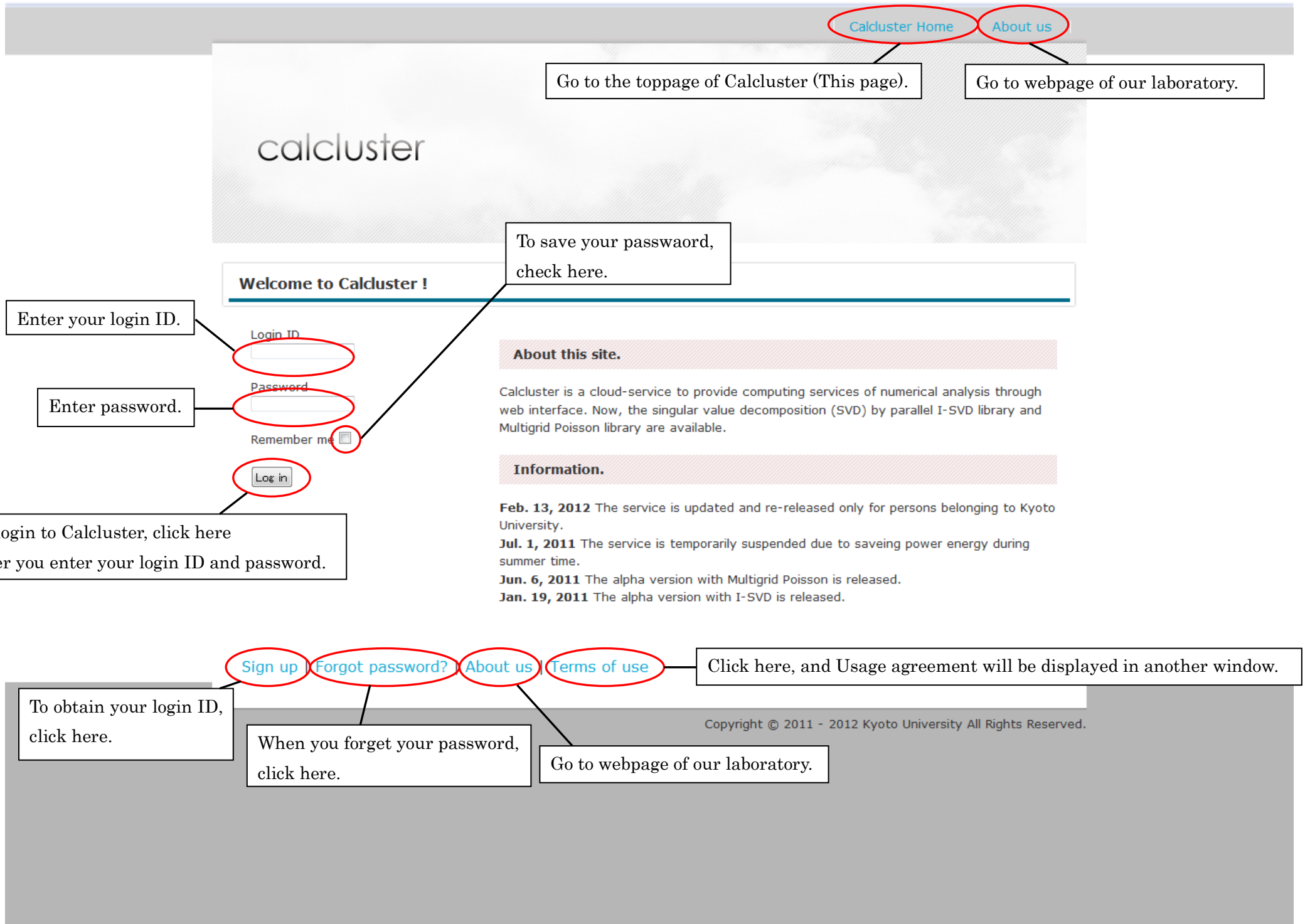
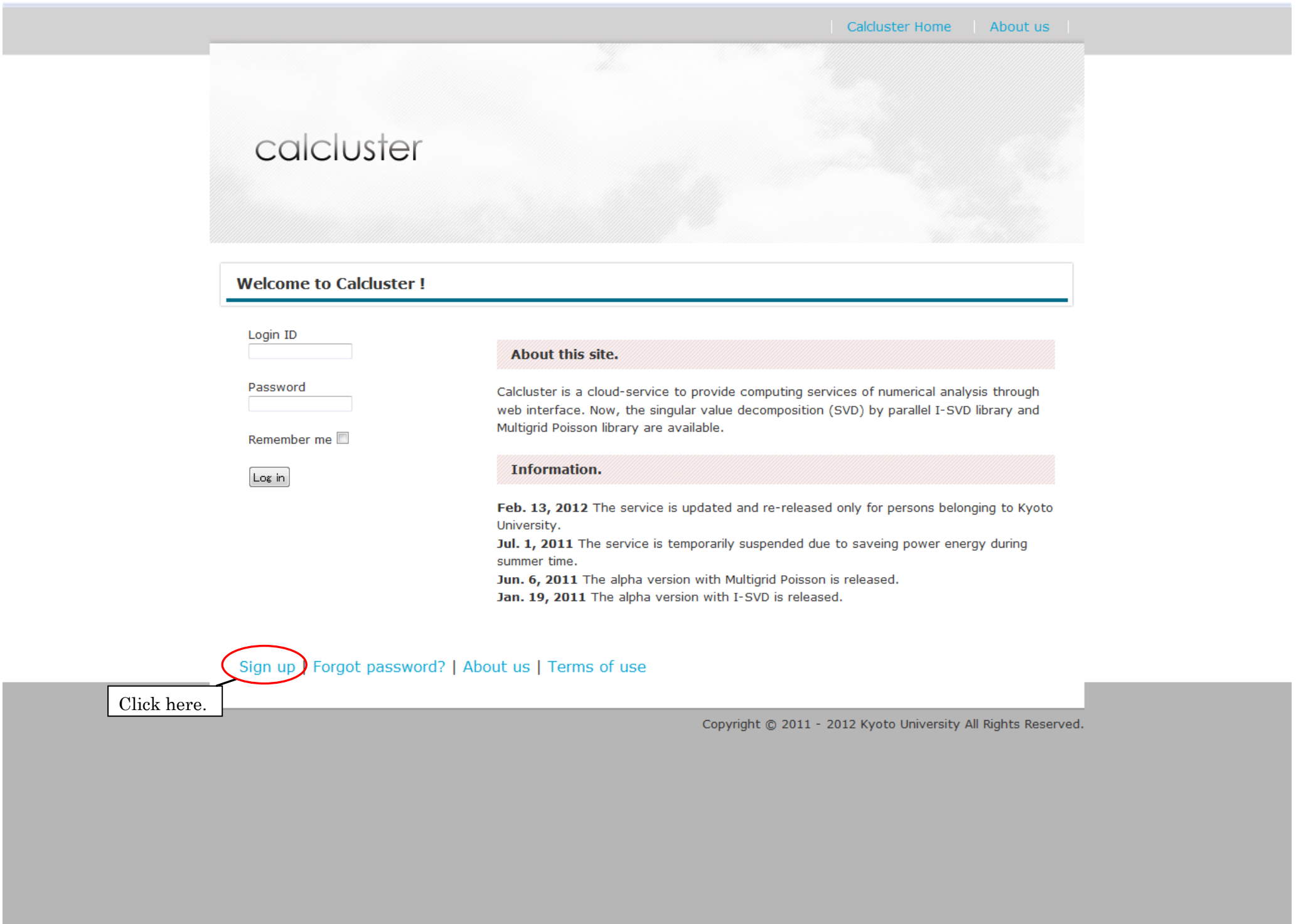
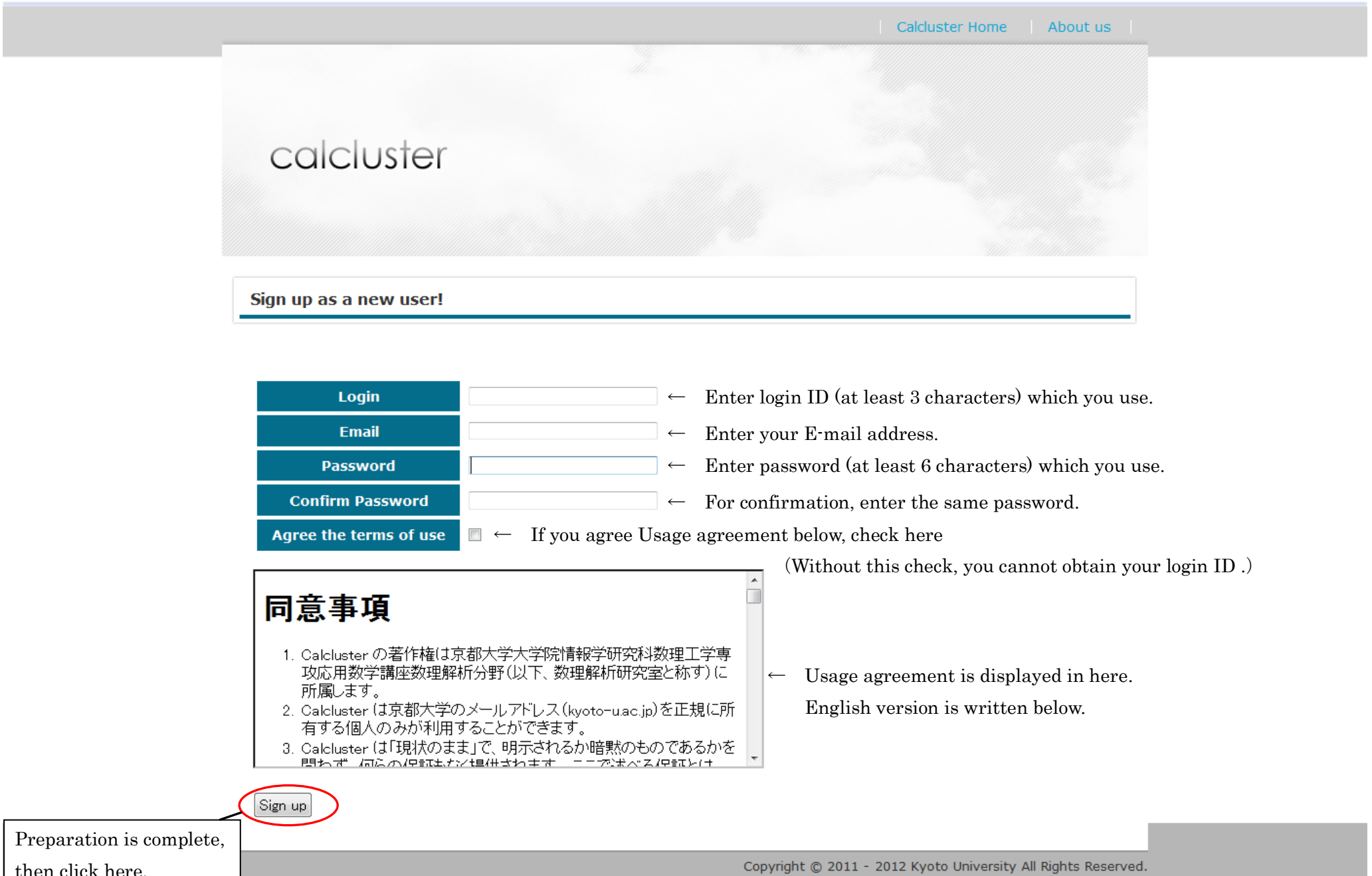
On the top page of Calcluster



Obtainment of login ID①



Obtainment of login ID②



← Enter login ID (at least 3 characters) which you use.

← Enter your E-mail address.

← Enter password (at least 6 characters) which you use.

← For confirmation, enter the same password.

← If you agree Usage agreement below, check here

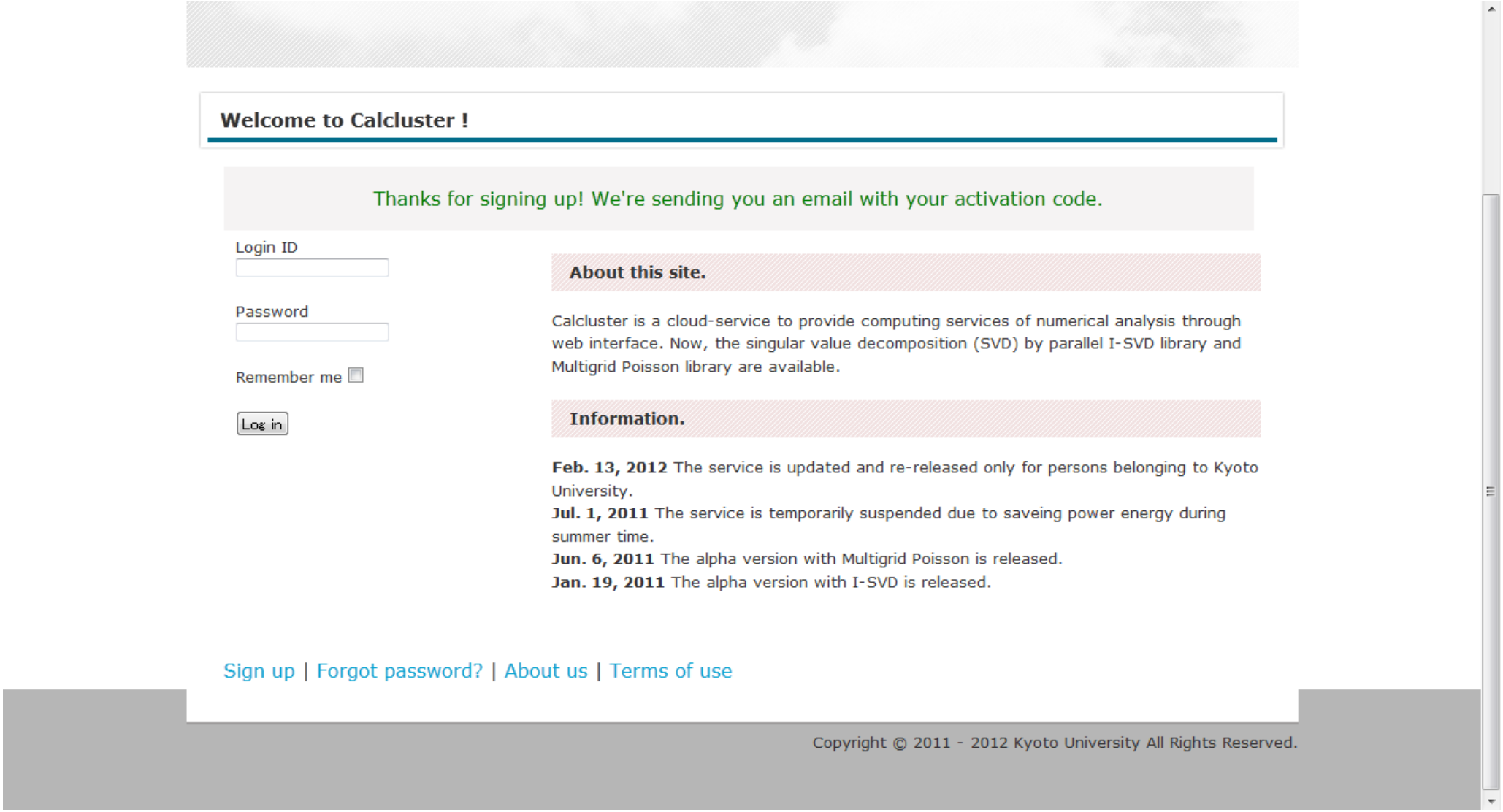
(Without this check, you cannot obtain your login ID .)

← Usage agreement is displayed in here.

English version is written below.

Preparation is complete, then click here.

Obtainment of login ID③

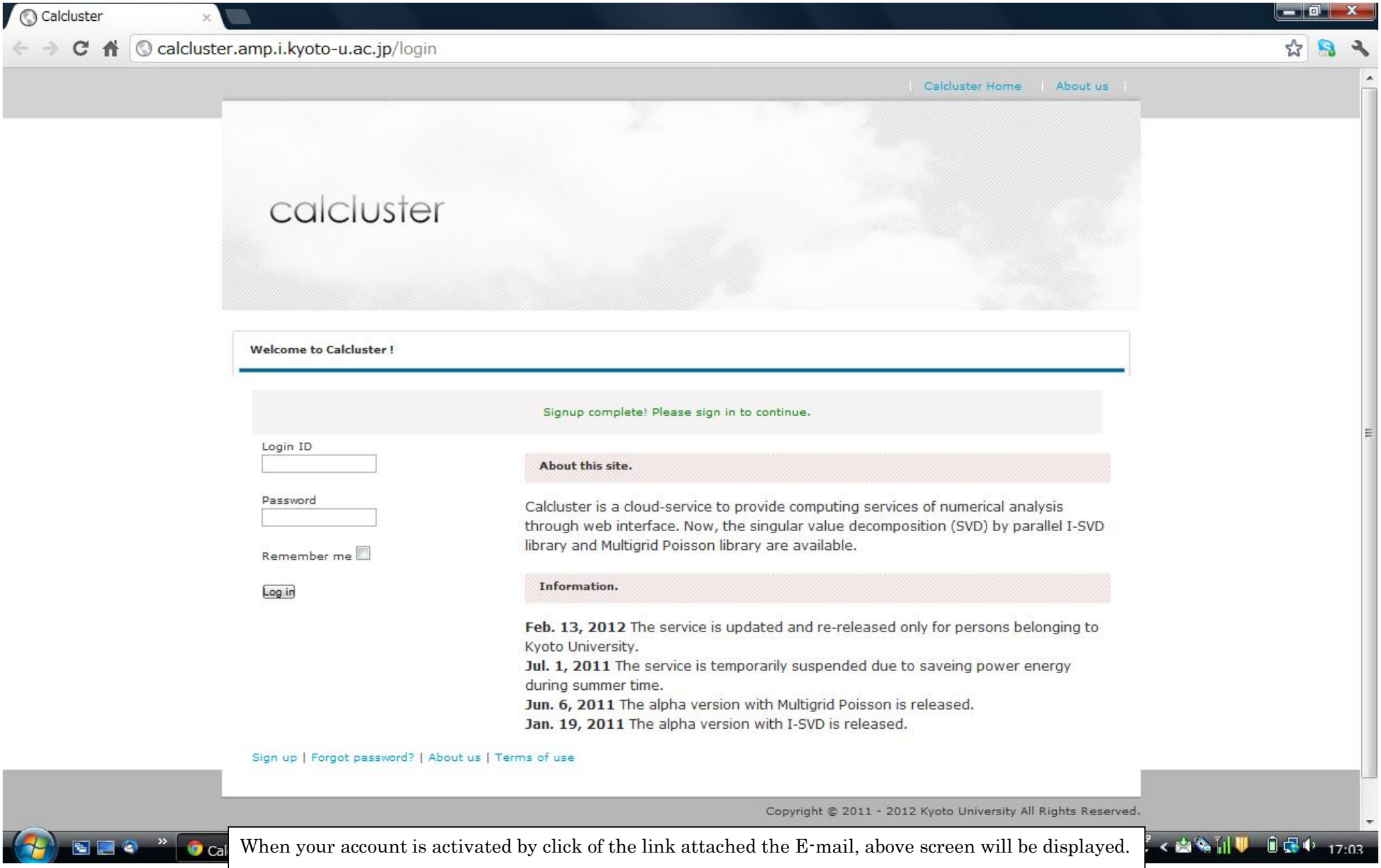


When you succeed to obtain your login ID,above screen will be displayed.

Then, you will receive an E-mail with title “[Calcluster] Please activate your new account“.

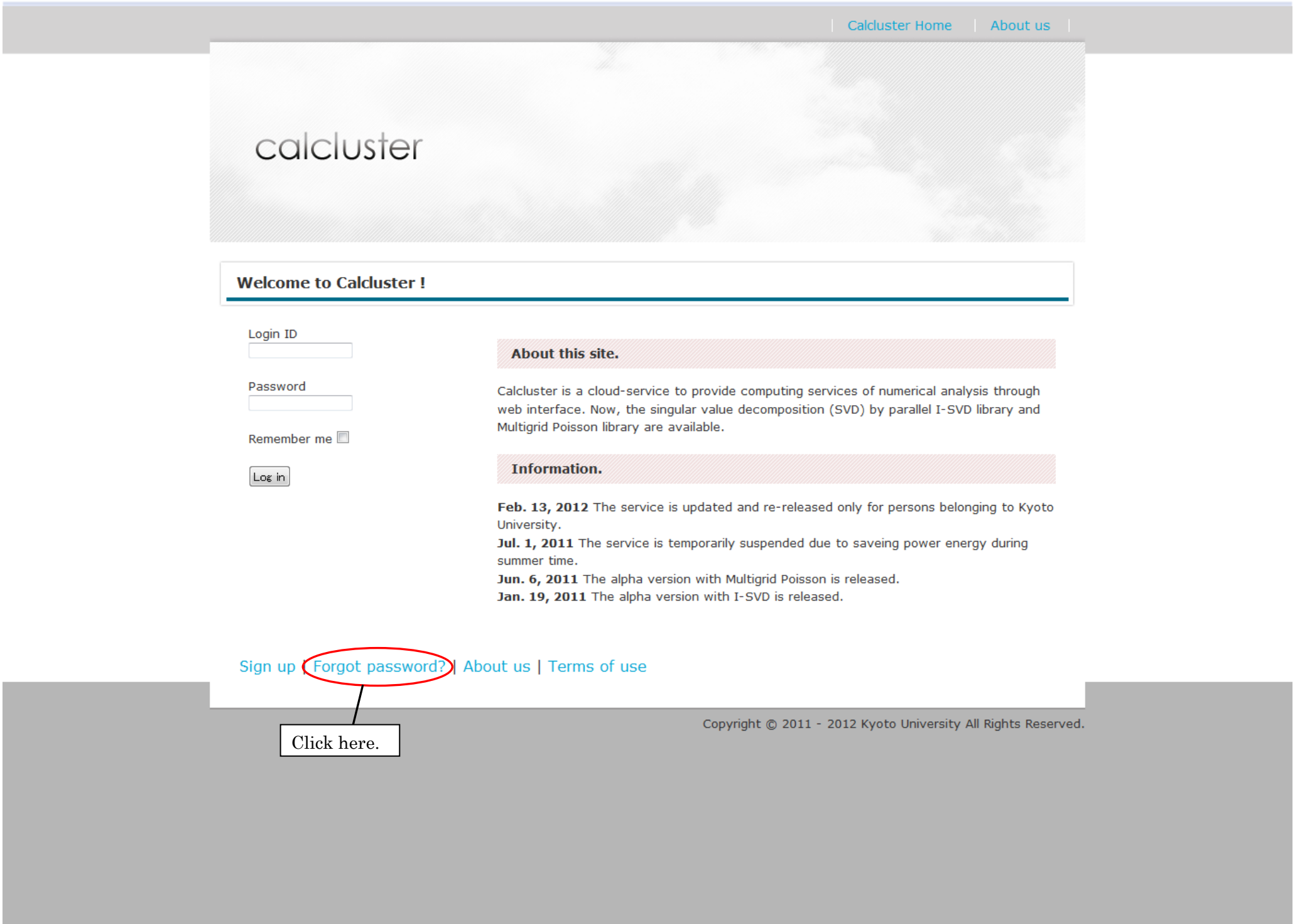
To activate your account, click the link attached in the E-mail.

Obtainment of login ID④

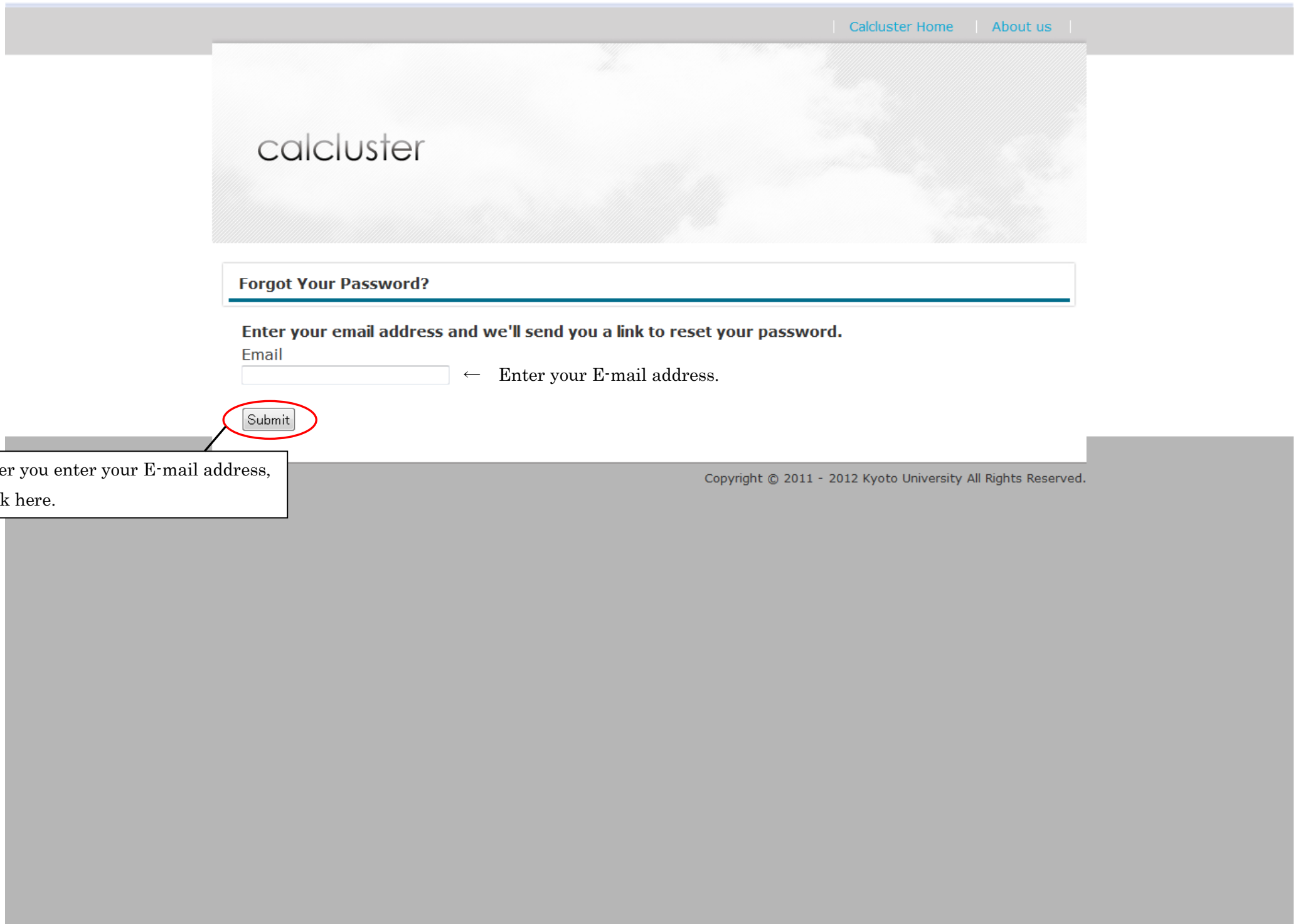


When your account is activated by click of the link attached the E-mail, above screen will be displayed.
Moreover, you will receive an E-mail with title“[Calcluster] Your account has been activated!”.
Then you can useCalcluster.

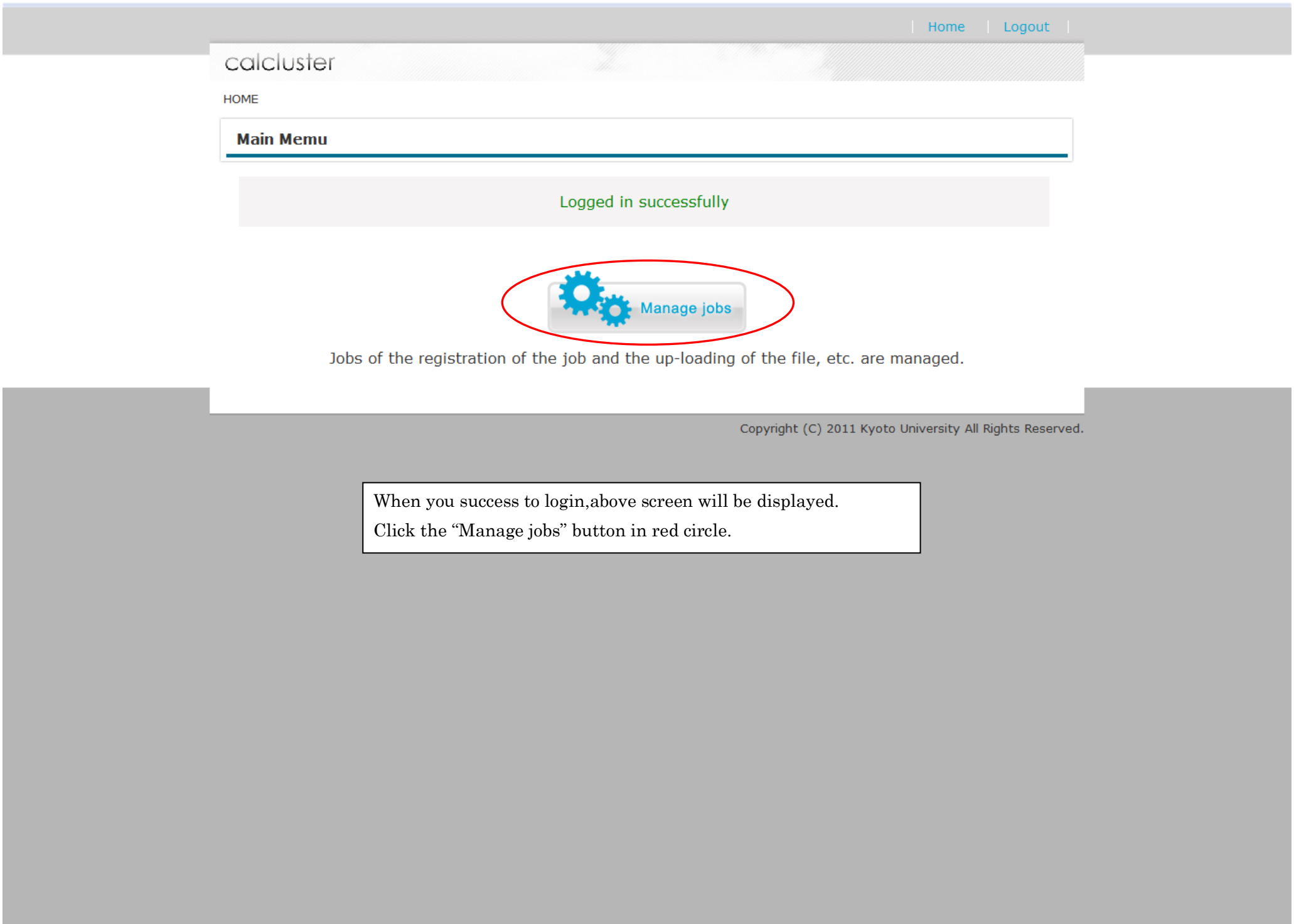
When you forget your password①



When you forget your password②

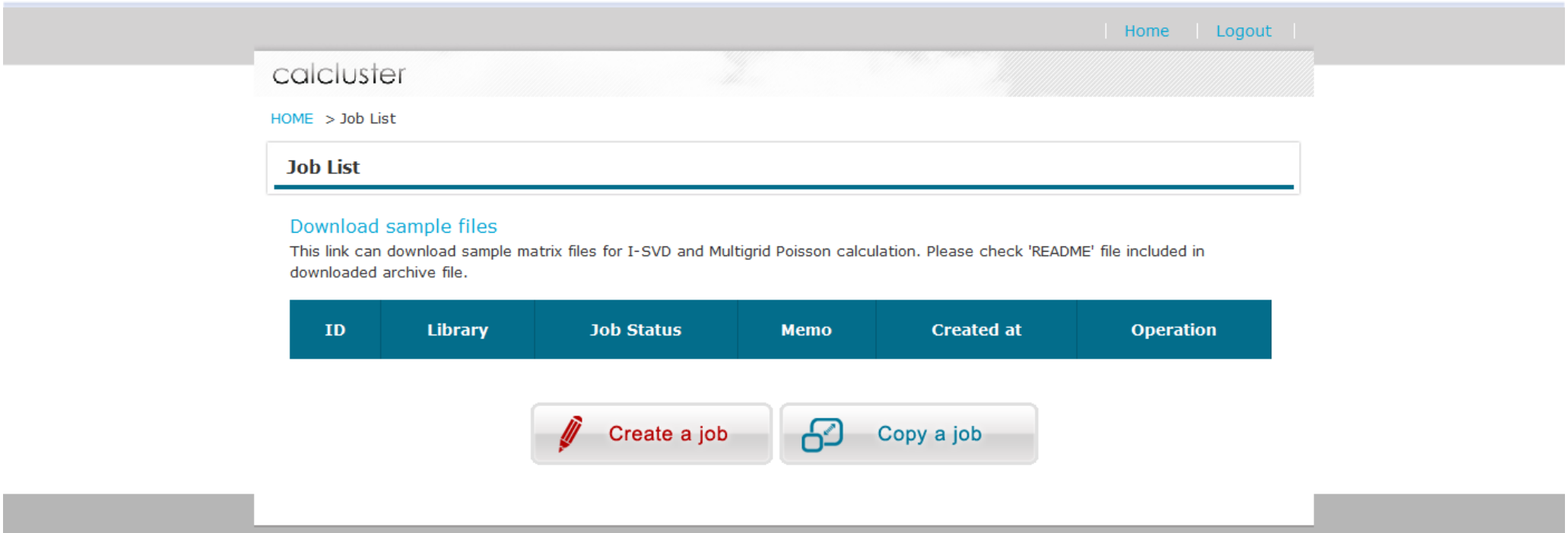


Main Menu screen



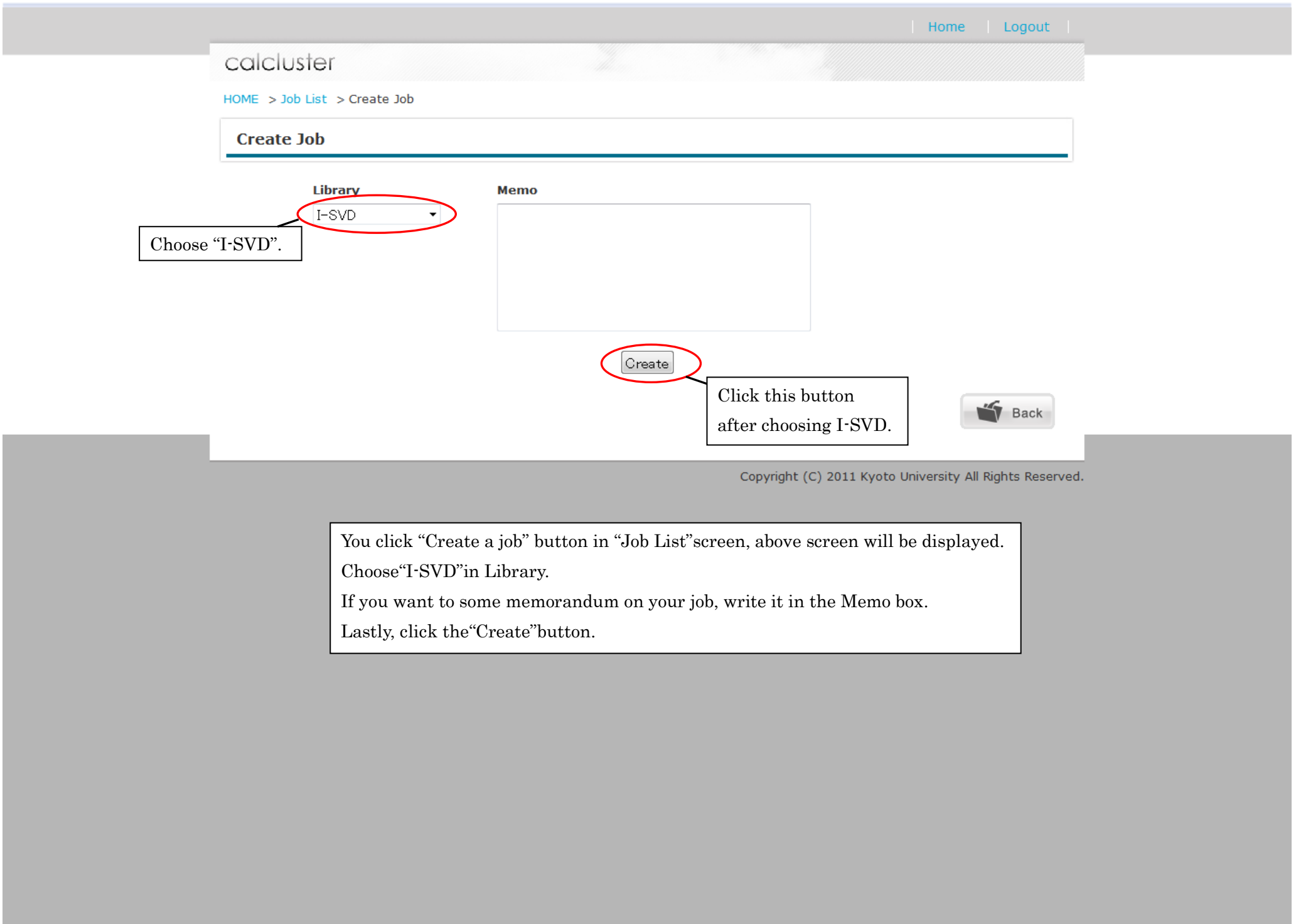
When you success to login,above screen will be displayed.
Click the “Manage jobs” button in red circle.

Job List screen



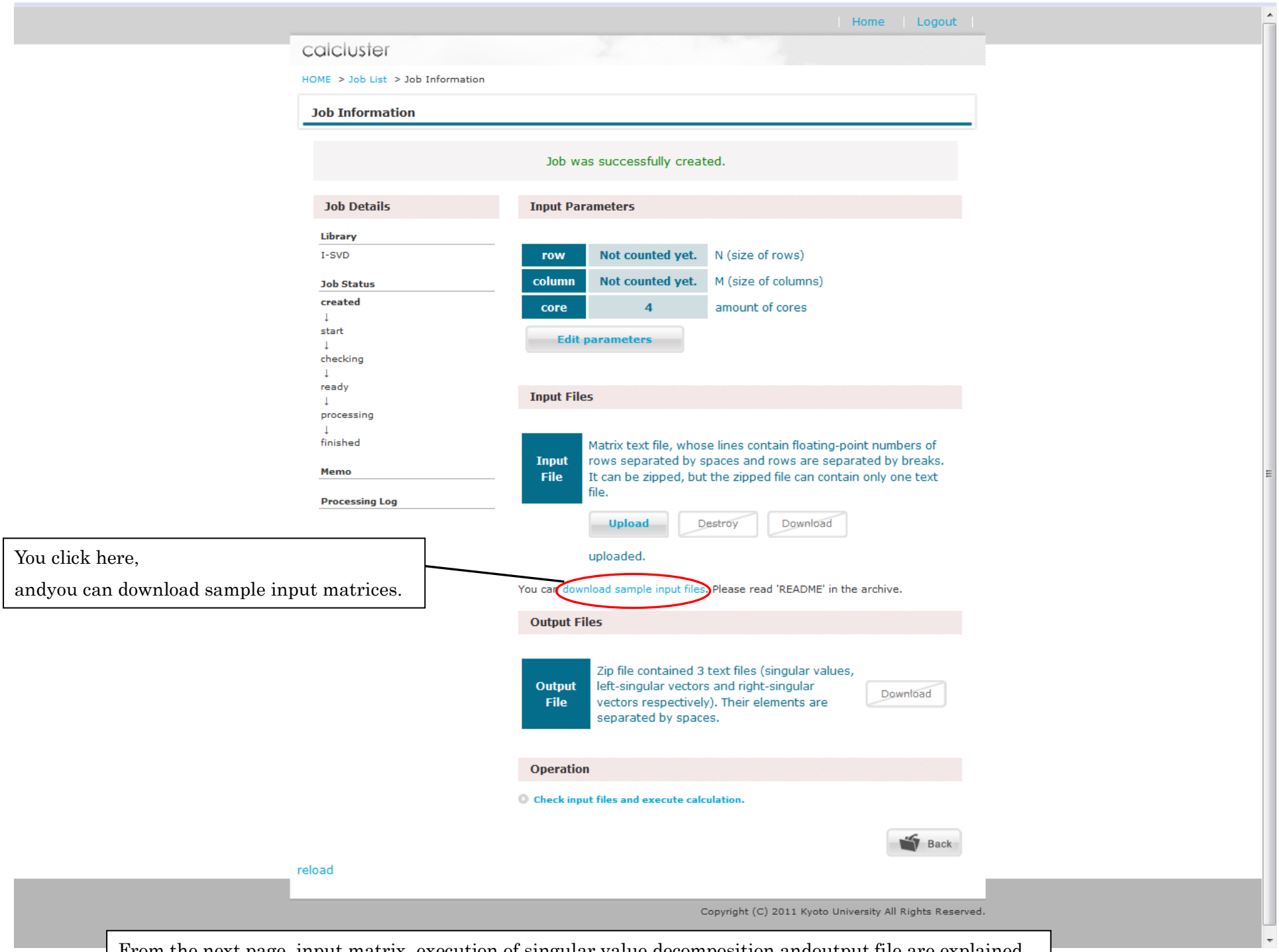
You click “Manage jobs” button in “Main Menu” screen,
andabove screen will bedisplayed.
To execute singular value decomposition newly,click the “Create a job”button.

Create Job screen



You click “Create a job” button in “Job List”screen, above screen will be displayed.
Choose“I-SVD”in Library.
If you want to some memorandum on your job, write it in the Memo box.
Lastly, click the“Create”button.

Job Information screen



You click here,
andyou can download sample input matrices.

From the next page, input matrix, execution of singular value decomposition andoutput file are explained.

How to make a file of an input matrix

For example, when an input matrix is

$$\begin{pmatrix} 1 & 4 & 7 & 10 \\ 2 & 5 & 8 & 11 \\ 3 & 6 & 9 & 12 \end{pmatrix},$$

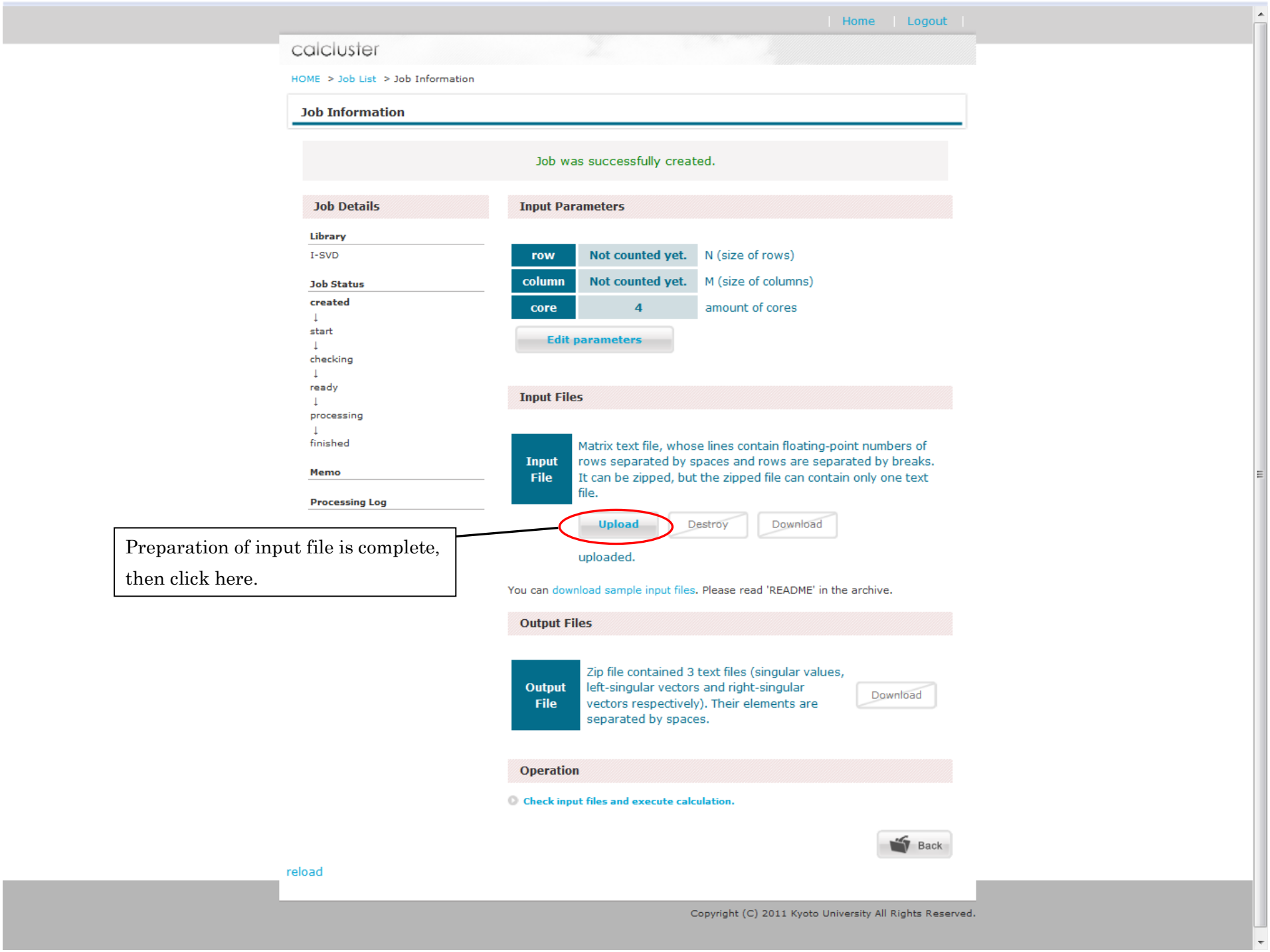
then, write each element in a text file as follows.

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

Note that the rows and columns are transposed in the input file.

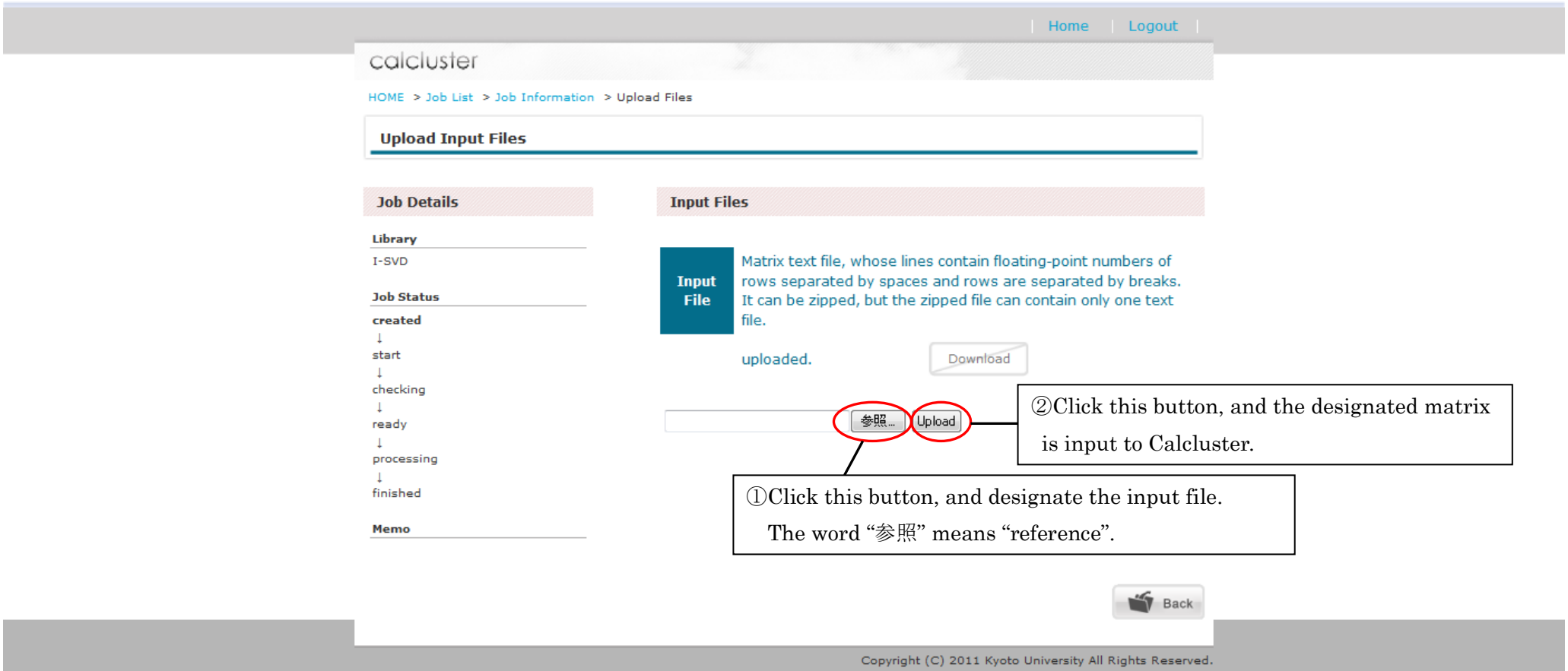
Each element in the same line in an input file should be split by space

Input of a matrix to Calcluster①



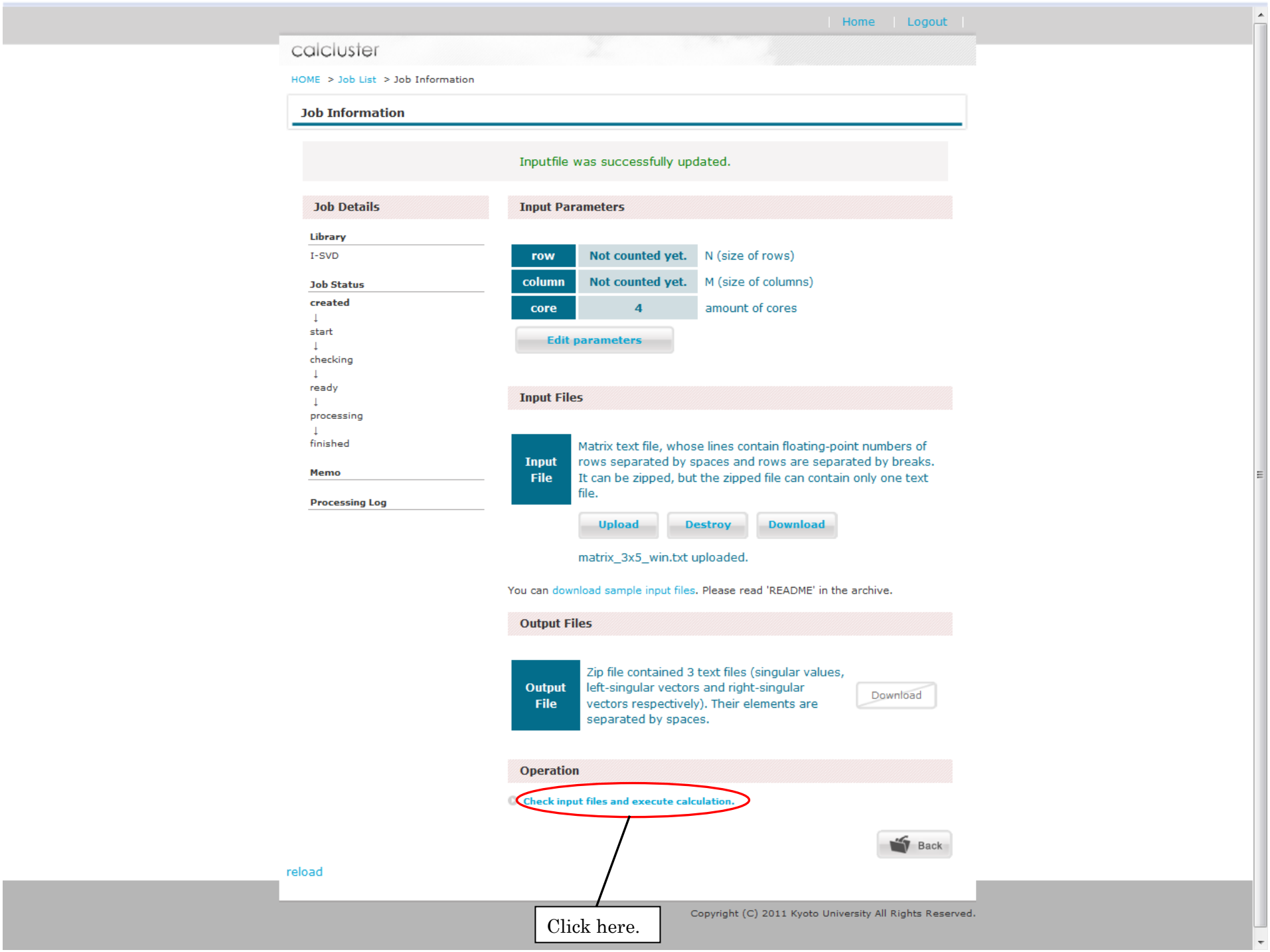
Preparation of input file is complete, then click here.

Input of a matrix to Calcluster②



You click “Uproad” button of item “Input Files” in “Job Information” screen, and above screen will be displayed.
Click the “参照”(reference) button and designate input file.
Then click the“Upload”button andthe input file is input to Calcluster.

Execution of singular value decomposition①

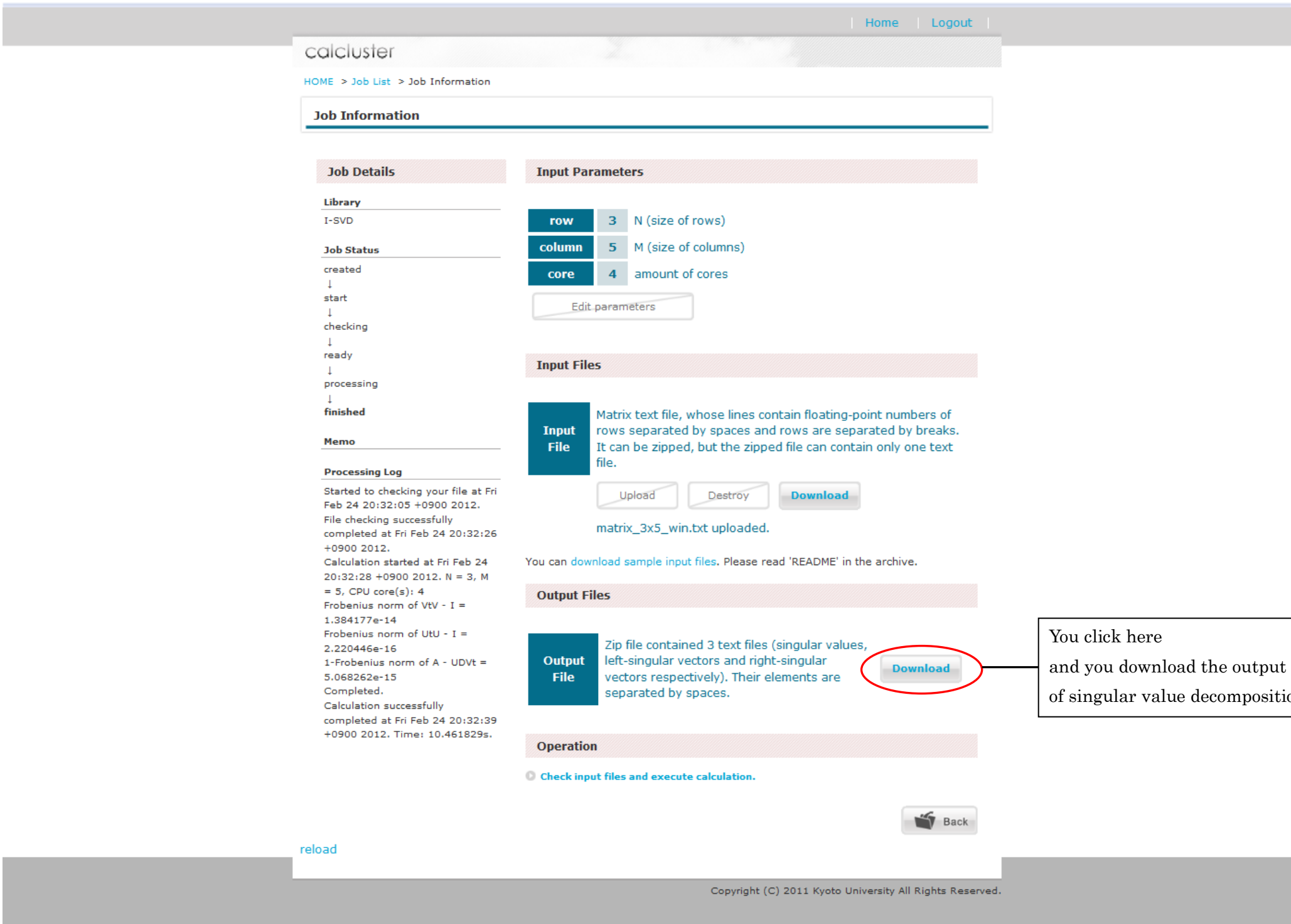


Execution of singular value decomposition②

When “Job Status”becomes “finished”,singular value decomposition is finished.

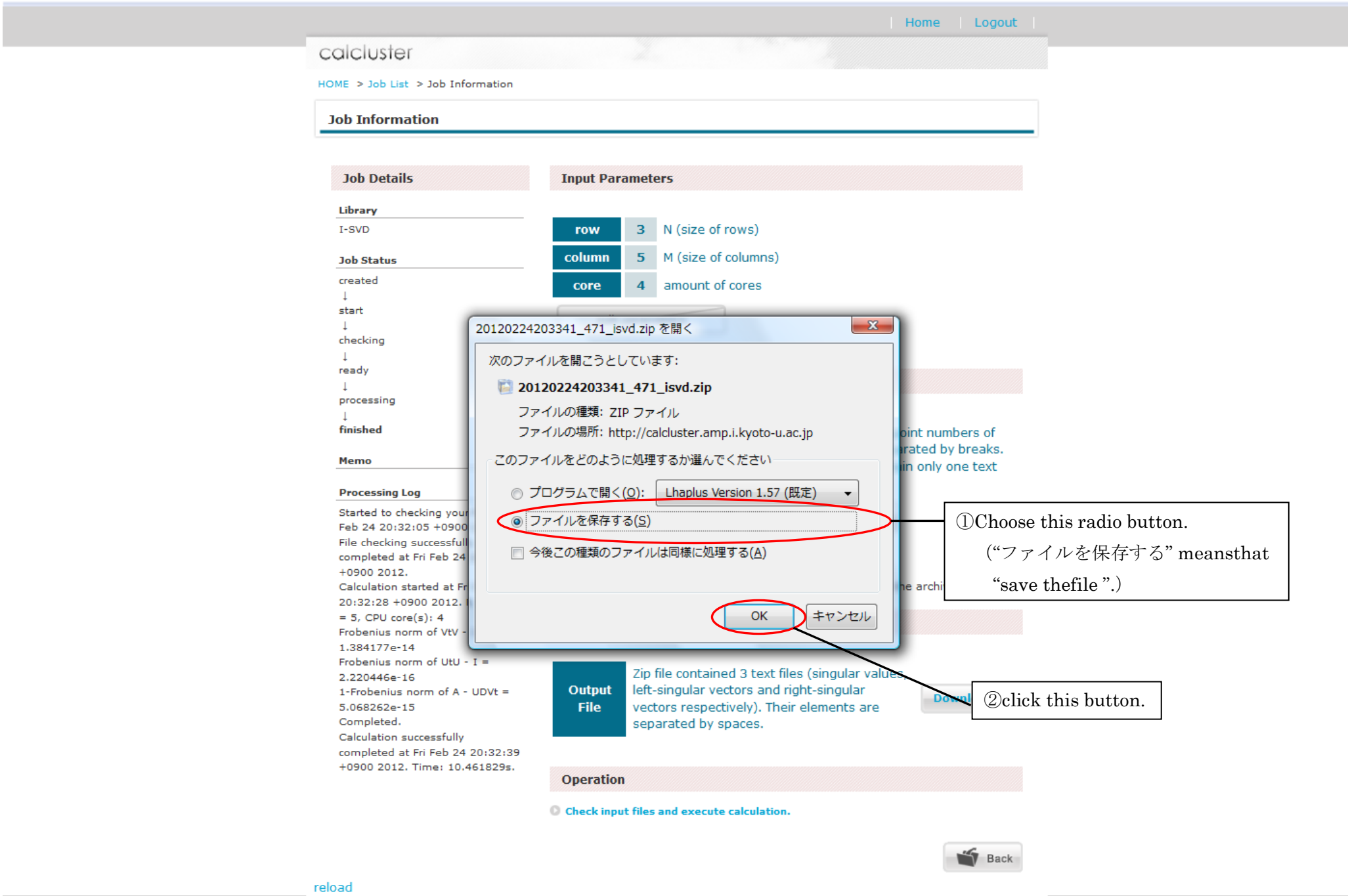
Information on execution of singular value decomposition is displayed.

Download of a output files of singular value decomposition①



You click here
and you download the output file of singular value decomposition.

Download of a output files of singular value decomposition②



Push the "OK" button after choosing "ファイルを保存する（S)" radio button which means "save the file" in the dialogue box.

Download of a output files of singular value decomposition③

Here, we explain downloaded files.

The downloaded files are compressed as zip file. Decompress this compressed file, and you have the following three files.

①left_singular_vectors

②singular_values

③right_singular_vectors

Let us regard the data in the files ① and③ as a matrix.

Let these matrices be U and V^T , respectively.

Let Σ_r be a diagonal matrix which the computed singular values in the file ② are on the diagonals in descending order.

Let make a matrix

$$\Sigma = \begin{pmatrix} \Sigma_r & O \\ O & O \end{pmatrix}$$

by adding zero elements if necessary. Then, the singular value decomposition of the input matrix A is

$$A = U\Sigma V^T .$$

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