MASTER OF TECHNOLOGY
USER GUIDE

Mortgage Process System

CAO LIANG

MASTEROFTECHNOLOGY

INTELLIGENT REASONING SYSTEMS (IRS) - MACHINE REASONING (MR)

Mortgage Process System

User Guide

REQUIREMENTS:

RECOMMENDED BROWSERS

BTO Recommender system supports the following Web Browsers::

- Internet Explorer 11
- Microsoft Edge 39 and above
- Firefox 53 and 52 ESR and above
- Google Chrome Version 59 and above
- Safari Version 10 and above

SYSTEM OVERVIEW

The mortgage process system is the system used for the bank to approve the home mortgage application. The system utilizes the machine learning reasoning technics to automate the important steps to determine whether the home mortgage application meets the pre-defined criteria.

USER INTERFACE

The user interface runs in KIE web tool. The users should be pre-created and configured with the required roles and groups. The KIE web tool will be accessed through the web browser.

DEPLOYMENT

Our System is deployed in an Ubuntu server 16.04.4. In order to run the system, you will need to have java 1.8 or above to be installed, and download "jbpm-server-7.12.0.Final-dist.zip" and unzip to a sub folder "jbpm-server-7.12.0.Final-dist" at a folder (e.g /home/iss-user/iss-vm-program/).

Download "CaoLiang-Mortgage_Process_ISS_MR.zip" from Github or Individual project submission folder, and unzip it to a sub folder "CaoLiang-Mortgage_Process_ISS_MR" at a folder (e.g /home/iss-user/iss-vm-program/).

To run our system, open a terminal, enter:

- cd <path of the unzipped folder, e.g. /home/iss-user/iss-vm-program/>
- jbpm-server-7.12.0.Final-dist/bin/standalone.sh

START

Open up your preferred browser and go to the URL "http://localhost:8080/jbpm-console/", login as user "iss-admin". Note: The user "iss-admin" should be created and assigned with the "admin", "analyst" and "developer" roles, and also assigned in the "iss-group-manager", "iss-group-requester", "iss-group-approver" and "kie-server".

iss-admin ✎ Edit

Groups   Roles   Permissions

iss-group-manager

iss-group-requester

iss-group-approver

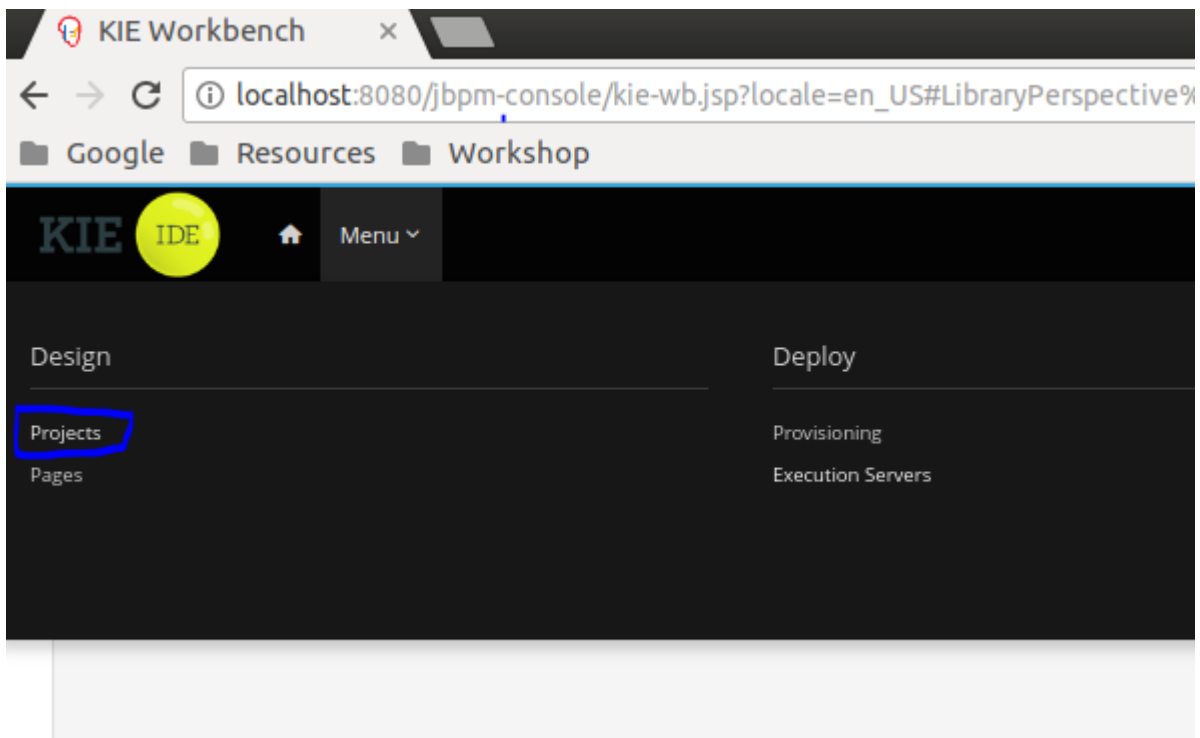kie-server

Total 4 groups assigned
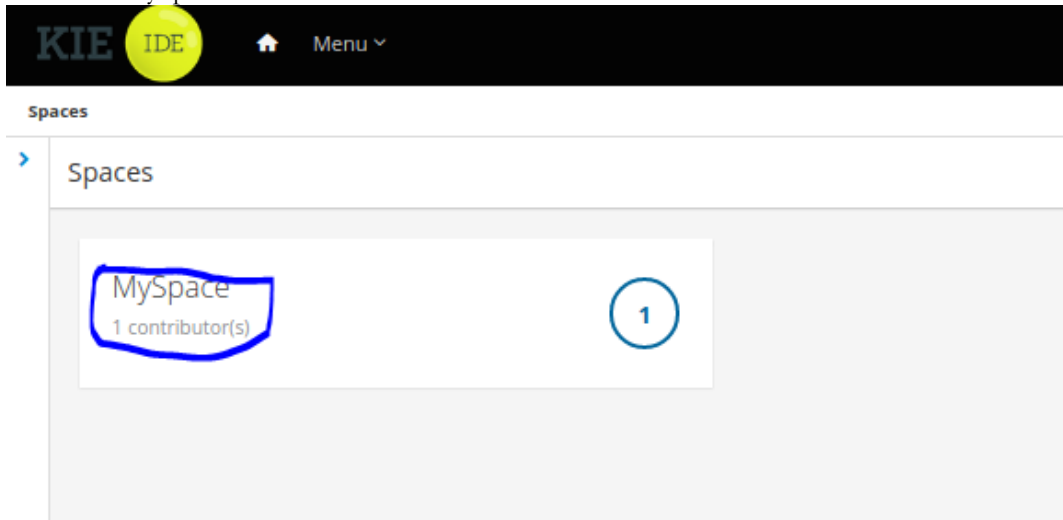
iss-admin ✎ Edit

Groups   **Roles**   Permissions

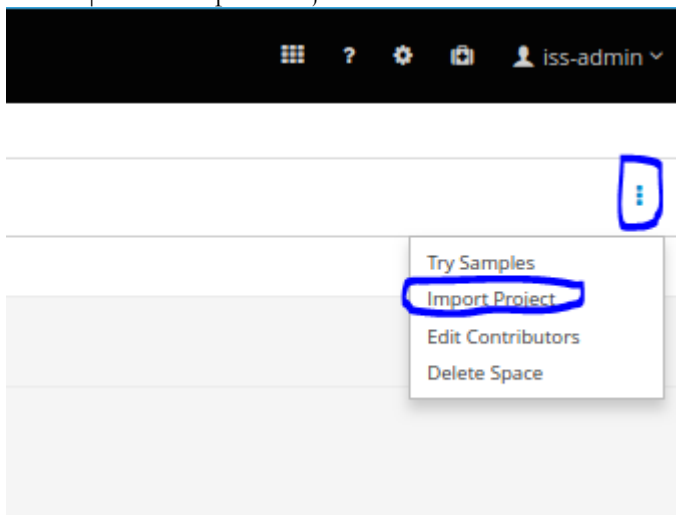process-admin

admin

analyst

user

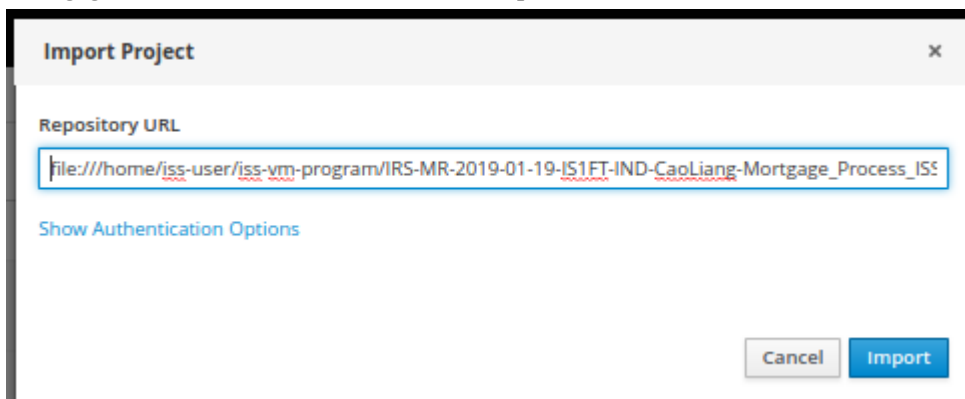Total 4 roles assigned
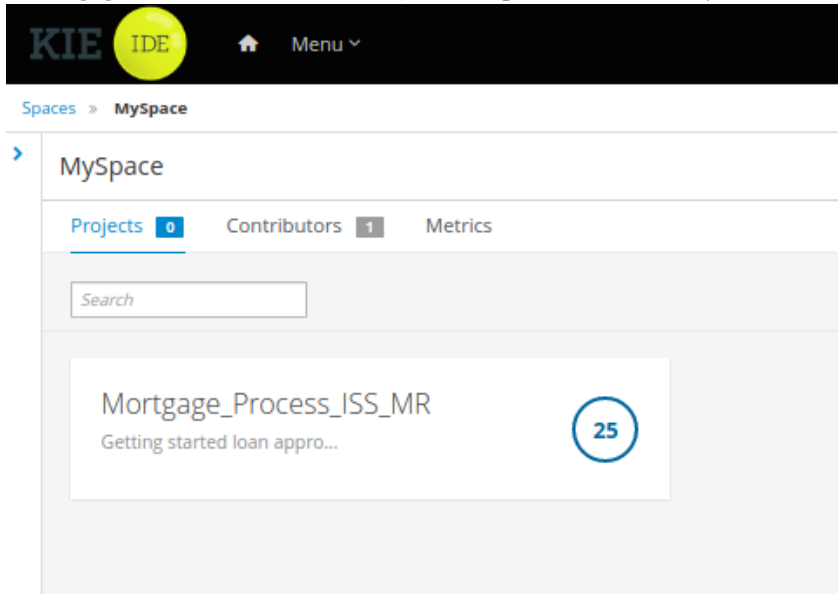
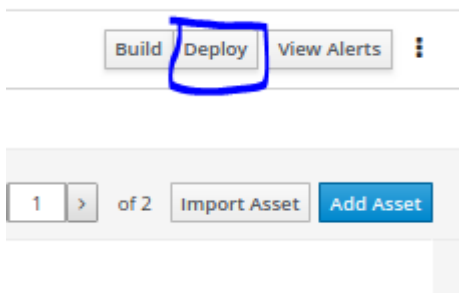click "Menu" -> "Projects".

Click on "MySpace".

Click "|" and "Import Project".

Type in file path with prefix e.g. "file:///home/iss-user/iss-vm-program/CaoLiang-Mortgage_Process_ISS_MR", then click "Import".
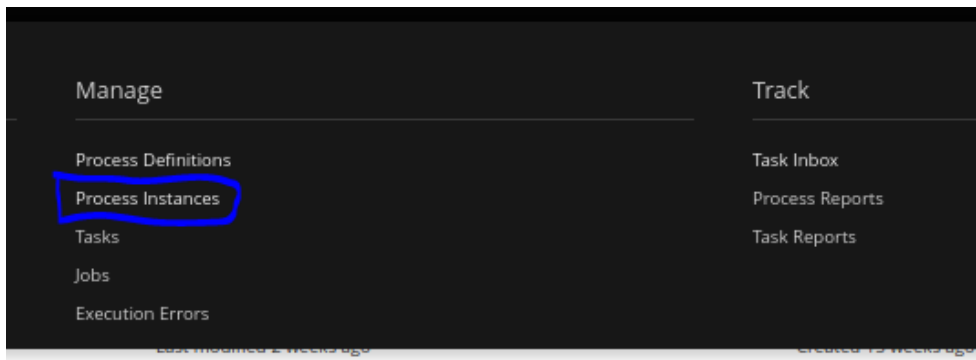
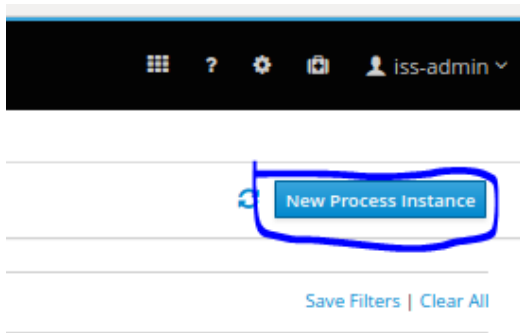"Mortgage_Process_ISS_MR" Project is imported successfully.

Click "Mortgage_Process_ISS_MR" Project, and click "Deploy" to deploy project.
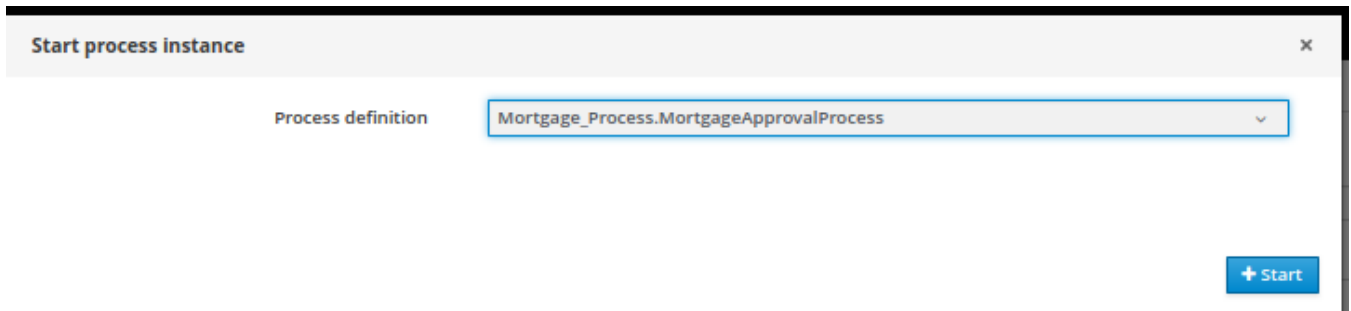

Click "Menu" -> "Process Instance".
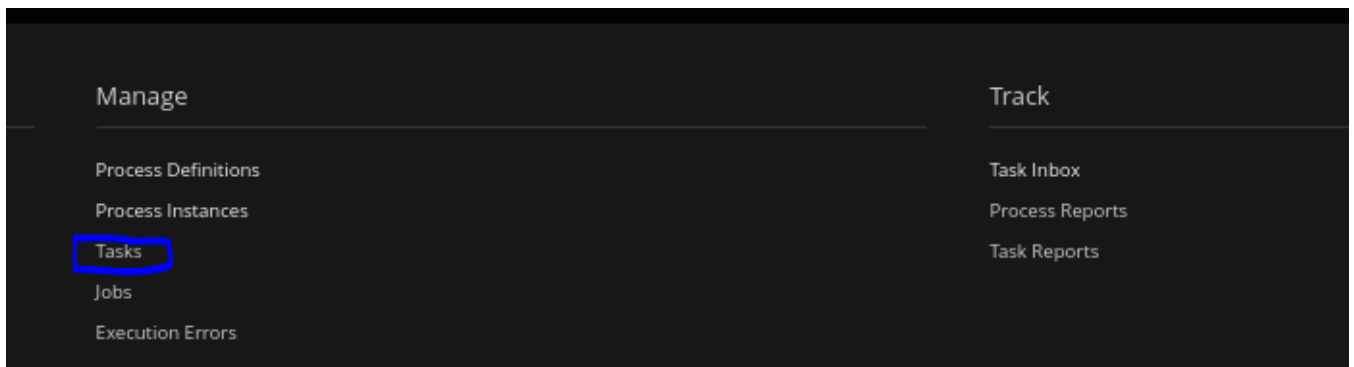

Click "New Process Instance".

Click "Start".

Fill in the mortgage application form, then click "Submit" to start process instance.

Click "Menu" -> "Tasks".

Click "Claim".

Click Task.

Click "Start".

8 - Final Approval

Amortization

> 20

Errors

Error

> Error

Downpayment

> 50000

Applicant

Address

> Address

Creditrating

> 3

☑ HasJob

Name

> CL

☐ OwnHouse

Age

> 20

Annualincome

> 111111

Ssn

> 123123

Outputs:

☐ Inlimt

Release | Start

Check "InLimitMR" status.

8 - Final Approval

Address

Jurong East

Saleprice

200000

Locale

Urban

Age

5

☑ InlimitMR

Mortgageamount

Mortgageamount

Amortization

20

Decide to approve by checking the "InLimit" checkbox, or reject it by leaving the "InLimit" checkbox unchecked, then click "Complete" to finish the whole process.
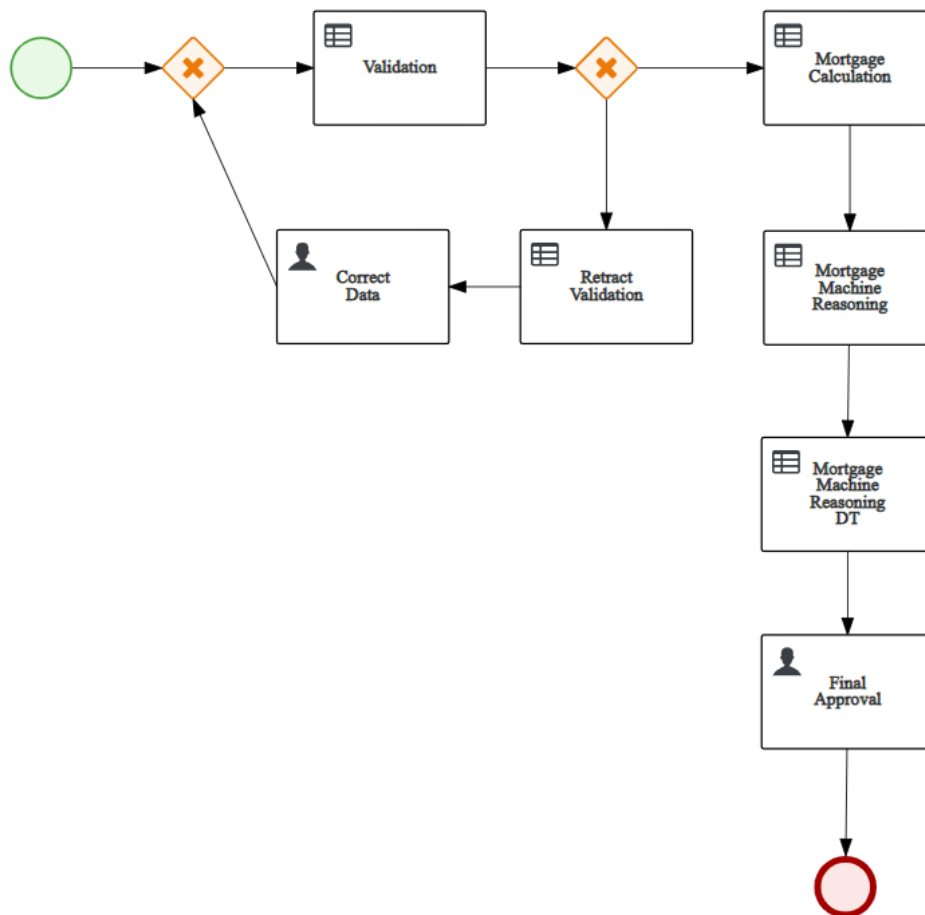
8 - Final Approval

Amortization

20

Errors

Error

Error

Downpayment

50000

Applicant

Address

Address

Creditrating

3

☑ HasJob

Name

CL

☐ OwnHouse

Age

20

Annualincome

111111

Ssn

123123

Outputs:

☐ Inlimit

Save | Release | Complete

BUSINESS SCENARIOS: SAMPLE INPUT & SYSTEM OUTPUT

In this section, the objective is to demonstrate the correctness of the mortgage process system. The process flow model and rules are shown below, and then three test scenarios are listed.

1. Process Flow model

2. Mortgage Machine Reasoning

3. Mortgage Machine Reasoning DT

MortgageMachineReasoningDT					
#	Description	ruleflow-group	Is Applicant Own House?	Is Applicant Has Job?	application
			$ownHouse	$hasJob	Is Approval In Limit?
1		bankmortgagecalculationdt	✔	✔	✔
2		bankmortgagecalculationdt	✔	☐	✔
3		bankmortgagecalculationdt	☐	✔	✔
4		bankmortgagecalculationdt	☐	☐	☐

4. Test Scenarios

SCENARIO 1

Application Details	Down Payment: S$50,000 Mortgage Amount: S$300,000 Property Sale Price: S$350,000 Applicant has job
1st Stage	InLimitMR checked: Mortgage Amount (300,000) >= Property Sale Price (350,000) – Down Payment (50,000)
2nd Stage	InLimitMR checked: applicant has job
System output	

SCENARIO 2

Application Details	Down Payment: S$50,000 Mortgage Amount: S$300,000 Property Sale Price: S$350,000 Applicant has no job but own a house
1st Stage	InLimitMR checked: Mortgage Amount (300,000) >= Property Sale Price (350,000) – Down Payment (50,000)
2nd Stage	InLimitMR checked: applicant has no job but own house
System output	

SCENARIO 3

Application Details	Down Payment: S$50,000 Mortgage Amount: S$300,000 Property Sale Price: S$350,000 Applicant has no job and no
1st Stage	InLimitMR checked: Mortgage Amount (300,000) >= Property Sale Price (350,000) – Down Payment (50,000)
2nd Stage	InLimitMR checked: applicant has no job and not owing house

System output	
	11 - Final Approval

Application

Property

Address

Jurong East

Saleprice

350000

Locale

Urban

Age

5

☐ InlimitMR

Mortgageamount

Mortgageamount

Amortization

20

---

11 - Final Approval

Applicant

Address

Address

Creditrating

3

☐ HasJob

Name

Tim

☐ OwnHouse

Age

20

Annualincome

0

Ssn

111111

Outputs:

☐ Inlimt

Save Release Complete