Bank Sinopac
Second Mortgage Approval Module

operation environment requirements

&

application programming interface

Decision Analytics Consulting

Contents

I Overview

I.1 Purpose

I.1.1 This document is to help Bank Sinopac prepare operation environment as well as interface program codes required by Bank Sinopac second mortgage lending (SML) approval module (the module) so that the module can be operational as part of Bank Sinopac's mortgage application processing system (e-loan system) within required time constraints.

I.1.2 The module is designed to be applied on Bank Sinopac's SML products only. Applying the module on products other than SML may generate poor approval recommendations.

I.2 Scope of this document

I.2.1 Database environment

I.2.2 Input data & input data quality assurance requirements

I.2.3 Output tables formats requirements

I.2.4 Application programming interface

I.3 Changes from the previous version of the module

I.3.1 Add column "GENDER" on table "APP_INFO" (IV.4.2) and on table "APP_R" (IV.5.2)

I.3.2 Delete three columns "RESERVED2", "RESERVED3", and "RESERVED4" from table "RESULT" (IV.3.5.2) and table "RESULT_R" (IV.3.6.2)

I.3.3 Add two columns "SECURED_PB" and "UNSECURED_PB" to table "RESULT" (IV.3.5.2) and table "RESULT_R" (IV.3.6.2)

I.3.4 Add one column "SC" with data type integer to table "APP_INFO", "RESULT" and "RESULT_R"

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I.3.6 A new API parameter "Gender" with data type integer for the gender of loan applicant (V.5.3)

I.3.7 A new API parameter "SC" with data type integer for whether the property is marked as "special" by BSP(V5.3)

II Database environment

II.1 Database environment refers to DAC SML approval database (the database) in which the module will be accessing in order to function properly

II.2 OS: Microsoft Windows 2000 or 2003 Server

II.3 DBMS: Microsoft SQL Server 2000

II.4 Collate: Chinese_Taiwan_Stroke_CS_AS

II.5 Number of database: One

II.6 Account Privileges: The SQL Server account must have the right to:

II.6.1 Read rows from the following input tables
II.6.1.1 KRM023
II.6.1.2 KRM001
II.6.1.3 BAM086
II.6.1.4 STM001
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II.6.2 Create / Drop Tables

II.6.3 Insert rows into the following output tables
II.6.3.1 APP_INFO
II.6.3.2 RESULT
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III Input data preparation & quality assurance

III.1 Input tables must be created as described in the following sections before running the module

III.2 Input data are from two sources:
- Database tables
- Function parameters

III.3 Input data from database tables

III.3.1 Five tables

Table name	Source of data
KRM023	JCIC KRM023
KRM001	JCIC KRM001
BAM086	JCIC BAM086
STM001	JCIC STM001
JAS002	JCIC JAS002

III.3.2 KRM023 table format:

Column name	Data type	Description	NULL permitted
MSN	Char(20)	案件編號	No
TIME_STAMP	Char(12)	YYYYMMDDHHMi (accurate to the minute)	No
IDN	Char(14)	個人編號	No
YRMON	Char(5)	資料年月(YYYMM, YYY 為民國年)	No
ISSUE	Char(3)	發卡機構代號	No
ISSUE_NAME	Char(40)	發卡機構名稱	Yes
KR_CODE	Char(7)	信用卡別	Yes
LIMIT	Char(5)	核定額度(新台幣千元)	Yes
PAYMENT	Char(3)	應繳金額級距(元)(位數+HML)	Yes
CASH	Char(1)	預借現金有無(Y/N)	Yes
PAY_CODE	Char(1)	繳款狀況代號	Yes

III.3.2.1 Primary key: MSN, TIME_STAMP, YRMON, ISSUE, IDN

III.3.2.2　Data should be placed at a SQL database table (called KRM023) and meet the quality requirements described in section III.5.1

III.3.3　KRM001 table format:

Column name	Data type	Description	NULL permitted
MSN	Char(20)	案件編號	No
TIME_STAMP	Char(12)	YYYYMMDDHHMi(accurate to the minute)	No
IDN	Char(14)	個人編號	No
CARD_BRAND	Char(1)	卡名代號	Yes
CARD_TYPE	Char(1)	標章代號	Yes
ISSUE	Char(3)	發卡機構代號	Yes
ISSUE_NAME	Char(40)	發卡機構名稱	Yes
START_DATE	Char(7)	啓用日期(YYYMMDD, YYY 爲民國年)	Yes
STOP_DATE	Char(7)	停用日期(YYYMMDD, YYY 爲民國年)	Yes
STOP_CODE	Char(1)	停用種類代號	Yes
AB_CODE	Char(1)	停用原因代號	Yes
M_S	Char(1)	主附卡 (YN)	Yes
LIMIT	Char(6)	額度（新台幣千元）	Yes
LIMIT_TYPE	Char(1)	是否綜合額度 (YN)	Yes
USAGE_TYPE	Char(1)	能否循環使用 (YN)	Yes
SECURE	Char(1)	擔保註記 (YN)	Yes

III.3.3.1　Data should be placed at a SQL database table (called KRM001) and meet the quality requirements described in section III.5.1

III.3.4　BAM086 table format:

Column name	Data type	Description	NULL permitted
MSN	Char(20)	案件編號	No
TIME_STAMP	Char(12)	YYYYMMDDHHMi (accurate to the minute)	No
IDN	Char(14)	個人編號	No
DATA_YYY	Char(3)	資料年度(民國年)	Yes
DATA_MM	Char(2)	資料月份	Yes

BANK_CODE	Char(7)	行庫代號	Yes
BANK_NAME	Char(40)	行庫名稱	Yes
ACCOUNT_CODE	Char(1)	會計科目	Yes
ACCOUNT_CODE2	Char(1)	會計科目註記	Yes
PURPOSE_CODE	Char(1)	用途別	Yes
CONTRACT_AMT	Int	訂約金額 (新台幣千元)	Yes
LOAN_AMT	Int	放款未逾期 (新台幣千元)	Yes
PASS_DUE_AMT	Int	逾期未還金額 (新台幣千元)	Yes
PAY_CODE_12	Char(12)	最近 12 個月還款紀錄	Yes
CO_LOAN	Char(1)	共同借款註記	Yes

III.3.4.1　Data should be placed at a SQL database table (called BAM086) and meet the quality requirements described in section III.5.1

III.3.5　STM001 table format:

Column name	Data type	Description	NULL permitted
MSN	Char(20)	案件編號	No
TIME_STAMP	Char(12)	YYYYMMDDHHMi (accurate to the minute)	No
IDN	Char(14)	個人編號	No
QUERY_DATE	Char(7)	查詢日期(YYYMMDD, YYY 為民國年)	Yes
BANK_CODE	Char(7)	查詢單位代號	Yes
BANK_NAME	Char(40)	查詢單位名稱	Yes
ITEM_LIST	Char(10)	查詢項目串列 B:授信 D:票信 K:信用卡等	Yes

III.3.5.1　Data should be placed at a SQL database table (called STM001) and meet the quality requirements described in section III.5.1

III.3.6　JAS002 table format:

Column name	Data type	Description	NULL permitted
MSN	Char(20)	案件編號	No
TIME_STAMP	Char(12)	YYYYMMDDHHMi (accurate to the minute)	No
IDN	Char(14)	個人編號	No

EVER_DELINQUENT	Char(1)	授信異常 (Y / N)	Yes
DELINQUENT_DATE	Char(7)	最近授信異常日期	Yes
EVER_BAD_CHECK	Char(1)	退票異常 (Y / N)	Yes
BAD_CHECK_DATE	Char(7)	最近退票異常日期	Yes
EVER_REJECT	Char(1)	拒絕往來記錄 (Y / N)	Yes
REJECT_DATE	Char(7)	拒絕往來日期	Yes
EVER_STOP_CARD	Char(1)	強制停卡異常 (Y / N)	Yes
STOP_CARD_DATE	Char(7)	最近強制停卡日期	Yes

III.3.6.1   Data should be placed at a SQL database table (called JAS002) and meet the quality requirements described in section III.5.1

III.4   Input data from function parameters (Please refer to section V.5.2)

III.5   Data quality requirement

III.5.1   Inputs via database tables

III.5.1.1   Rows with identical value on every column should be de-duped

III.5.1.2   Each applicant's data must be completely inserted into the corresponding tables before calling the module

III.5.2   Inputs via function parameters (Please refer to section V5.2.1)

IV   Output tables

IV.1   Output tables must be created as described in the following sections before running the module

IV.2   Four output tables, which can be put into three categories

IV.2.1   Result tables

IV.2.1.1   One table storing results generated by the module (named "RESULT")
IV.2.1.2   One table storing the final approval decision after approval module and manual review (named "RESULT_R")

IV.2.2   Application info table (named "APP_INFO"): storing data input into the module

IV.2.3   Application result table (named "APP_R"): Tables storing the final application result

IV.3   Result tables

IV.3.1   The module will be responsible for storing data into one table named "RESULT"

IV.3.2   The module will be responsible for coping the data in "RESULT" into the table named "RESULT_R"

IV.3.3   E-loan system will read the table "RESULT" to get the module outputs

IV.3.4   E-loan system will be responsible for updating the table "RESULT_R" with final approval decision after manual review

IV.3.5   RESULT

IV.3.5.1   One row of output will be appended to this table each time the module is executed

IV.3.5.2   RESULT table format as follows

Column name	Data type	Description	NULL permitted
MSN	Char(20)	案件編號	No
IDN	Char(14)	貸款申請人個人編號	No
IDN1	Char(14)	房屋所有人個人編號	No
IDN2	Char(14)	房屋共同所有人個人編號	No
TIME_STAMP	Char(12)	YYYYMMDDHHMi (accurate to the minute)	No
TEST_CELL	Int	產品代碼	No
HIGHEST_1	Int	最高建議有設定核貸金額 (新台幣元)	No
HIGHEST_2	Int	最高建議無設定核貸金額 (新台幣元)	No
RISK_SCORE	Float	風險評分	No
REVIEWED	Int	模組審核建議： 1: 模組審核 -1: 人工複審 (檢視 NPV，研究增加核准額度機會，以滿足申請人需求) -2: 人工複審 (檢視擔保品狀況，研究增加核准額度機會) -3: 人工審核 (NAV = GAV = 0) -4: 人工審核 (JCIC 資料不足)	No
SECURED_NPV	Float	有設定核貸金額之 NPV (新台幣元)	No
UNSECURED_NPV	Float	無設定核貸金額之 NPV (新台幣元)	No
SECURED_PB	Float	有設定核貸金額之 PB	No
UNSECURED_PB	Float	無設定核貸金額之 PB	No

SC	Int	特殊擔保品 (1:yes, 0:no)	No
DECLINE_REASON	Int	拒絕原因： 0: 模組核准 1: BSP 不予承做 (NAV = GAV = 0) 2. 房屋殘值不足 3. 申請人債務過多 4. 申請人近期內有重大信用瑕疵 5. JCIC 資料不足	No

IV.3.6   RESULT_R

IV.3.6.1   One row of output will be appended to this table each time the module is executed

IV.3.6.2   RESULT_R table format as follows

Column name	Data type	Description	NULL permitted
IDN	Char(14)	貸款申請人個人編號	No
IDN1	Char(14)	房屋所有人個人編號	No
IDN2	Char(14)	房屋共同所有人個人編號	No
MSN	Char(20)	案件編號	No
TIME_STAMP	Char(12)	YYYYMMDDHHMi (accurate to the minute)	No
TEST_CELL	Int	產品代碼	No
HIGHEST_1	Int	最高建議有設定核貸金額 (新台幣元)	No
HIGHEST_2	Int	最高建議無設定核貸金額 (新台幣元)	No
RISK_SCORE	Float	風險評分	No
REVIEWED	Int	審核狀況： 1: 審核完畢 (包括人工審核或複審完畢與模組自動審核) -1: 人工複審 (檢視 NPV，研究增加核准額度機會，以滿足申請人需求) -2: 人工複審 (檢視擔保品狀況，研究增加核准額度機會) -3: 人工審核 (NAV = GAV = 0) -4: 人工審核 (JCIC 資料不足)	No

SECURED_NPV	Float	有設定核貸金額之 NPV (新台幣元)	No
UNSECURED_NPV	Float	無設定核貸金額之 NPV (新台幣元)	No
SECURED_PB	Float	有設定核貸金額之 PB	No
UNSECURED_PB	Float	無設定核貸金額之 PB	No
SC	Int	特殊擔保品 (1:yes, 0:no)	No
DECLINE_REASON	Int	拒絕原因： 0: 模組核准 1: BSP 不予承做 (NAV = GAV = 0) 2: 房屋殘值不足 3. 申請人債務過多 4. 申請人近期內有重大信用瑕疵 5. JCIC 資料不足	No

IV.4   Application info table

IV.4.1   The module will be responsible for storing data into the table

IV.4.2   App_INFO table format as follows:

Parameter name	Data type	Description	NULL permitted
MSN	Char(20)	案件編號	No
IDN	Char(14)	貸款申請人個人編號	No
IDN1	Char(14)	房屋所有人個人編號	No
IDN2	Char(14)	房屋共同所有人個人編號	No
TIME_STAMP	Char(12)	YYYYMMDDHHMi(accurate to the minute)	No
GENDER	Int	貸款申請人性別(0:女; 1:男)	No
SC	Int	特殊擔保品 (1:yes, 0:no)	No
PRINCIPAL	Int	申請貸款金額(新台幣元)	No
TEST_CELL	Int	產品代碼	No
NAV	Int	鑑價金額(N 值) (新台幣元)	No
GAV	Int	鑑價金額(G 值) (新台幣元)	No

Parameter name	Data type	Description	NULL permitted
ZIP	Char(3)	房屋座落位置郵遞區號(3 碼)	No
FIRST_LIEN_VALUE	Int	房屋已設定價值(新台幣元)	No

IV.5   Application result table

    IV.5.1   BSP e-loan system will be responsible for storing data into the table

    IV.5.2   App_R table format as follows:

Parameter name	Data type	Description	NULL permitted
MSN	Char(20)	案件編號	No
IDN	Char(14)	貸款申請人個人編號	No
IDN1	Char(14)	房屋所有人個人編號	No
IDN2	Char(14)	房屋共同所有人個人編號	No
GENDER	Int	貸款申請人性別(0:女; 1:男)	No
APP_RESULT	Int	申請結果 (1:approved, 0:others)	No
PRINCIPAL_OR_LIMIT	Int	核准貸款金額(新台幣元)	No
LIEN	Int	是否設定 (1: yes, 0: no)	No
TEST_CELL	Int	產品代碼	No
NAV	Int	鑑價金額(N 值) (新台幣元)	No
GAV	Int	鑑價金額(G 值) (新台幣元)	No
Zip	Char(3)	房屋座落位置郵遞區號(3 碼)	No
FIRST_LIEN_VALUE	Int	房屋已設定價值(新台幣元)	No

V   Application programming interface

    V.1   Module operating mode: single-thread, single-process, one application (identified by MSN and Time_Stamp) at a time

    V.2   Deliverable will be one dynamic linking library (DLL), named "DAC_SML_NPV.dll"

    V.3   Application programming interface contains one function called DAC_SML_NPV

V.4   Function return

  V.4.1   Data type: int

  V.4.2   Represents function operation status

    V.4.2.1   0 means normal

    V.4.2.2   -1 means abnormal, please refer to V5.3

V.5   Function parameters

  V.5.1   Two categories

    V.5.1.1   Input parameters

      V.5.1.1.1   Pass input data into function for calculation

      V.5.1.1.2   Pass database access and data location information

    V.5.1.2   Output parameters

      V.5.1.2.1   Passed into function in the form of pointer

      V.5.1.2.2   For carrying output data back to the calling function or procedure

  V.5.2   Parameters listing

Parameter name	Data type	Description	Category	Remark
IDN	Char(14)	貸款人身份證號	Input	System generated
IDN1	Char(14)	房屋所有人身份證號	Input	System generated
IDN2	Char(14)	房屋共同所有人身份證號	Input	System generated
MSN	Char(20)	案件編號	Input	System generated
Time_Stamp	Char(12)	YYYYMMDDHHMi	Input	System generated
OLE_DB	Char(100)	OLE DB connection string	Input	DBMS connection information
Gender	Int	貸款申請人性別(0:女; 1:男)	Input	Data
SC	Int	特殊擔保品 (1:yes, 0:no)	Input	Data
Principal	Double	申請貸款金額(新台幣元)	Input	Data
Test_Cell	Int	產品代碼	Input	Data
GAV	Double	鑑價金額(G 值)(新台幣元)	Input	Data

NAV	Double	鑑價金額(N 值)(新台幣元)	Input	Data
Zip	Char(3)	房屋座落位置郵遞區號(3 碼)	Input	Data
First_Lien_Value	Double	房屋已設定價值(新台幣元)	Input	Data
Error_Msg	Char *	程式執行錯誤訊息	Output	Data type as a pointer to string

V.5.2.1   Parameters listed above with remark "Data" should meet the following quality requirement

V.5.2.1.1   Each parameter should be compliant with Bank Sinopac's business rules before calling the module. The module does not check any business rule violation.

V.5.2.1.2   Examples of business rules violation:

V.5.2.1.2.1   Principal is less than minimum approval amount or larger than maximum approval amount set by BSP

V.5.2.2   Parameter "Error_Msg" is designed for the module to pass error messages back to E-loan system. Recommended size is 251 bytes. Memory should be allocated properly before calling the module. Fail to do so may result in system crash.

V.5.2.3   The following are examples of the error message

V.5.2.3.1   Network & Server availability

V.5.2.3.1.1   [DBNETLIB][ConnectionWrite (send()).]一般網路錯誤。 查閱您的網路文件。

V.5.2.3.1.2   [DBNETLIB][ConnectionRead (recv()).]一般網路錯誤。 查閱您的網路文件。

V.5.2.3.1.3   [DBNETLIB][ConnectionOpen (Connect()).]SQL Server 不存在或拒絕存取。

V.5.2.3.2   Table missing

V.5.2.3.2.1   無效的物件名稱 'Table1'。

V.5.2.3.3   Account login and access right

V.5.2.3.3.1   使用者 'abc' 的登入失敗。原因: 未結合受信任的 SQL Server 連線。

V.5.2.3.3.2   於資料庫 'xyz' 中，CREATE TABLE 的權限遭拒。

V.5.2.3.3.3   SELECT 使用權限在物件 'table1'，資料庫 'xyz'，擁有者 'dbo' 上被拒絕。

V.5.2.3.3.4   INSERT 使用權限在物件 'table1'，資料庫 'xyz'，擁有者 'dbo' 上被拒絕。

V.5.2.3.4   Input data errors

V.5.2.3.4.1　鑑價值(G 值)必須大於鑑價值(N 值)

V.5.2.3.4.2　產品種類無法辨識

V.5.2.3.4.3　申請金額必須大於新台幣十萬元

V.5.2.3.4.4　設定值不得為負數

V.5.3　Function Call Example

```
int status = DAC_SML_NPV (IDN,
                          IDN1,
                          IDN2,
                          MSN,
                          Time_Stamp,
                          OLE_DB,
                          Gender,
                          SC,
                          Principal,
                          Test_Cell,
                          GAV,
                          NAV,
                          Zip,
                          First_Lien_Value,
                          Error_Msg);
if (status == -1) //throw exception codes here
//Get PD and NPV from mortgage approval database here
.
.
.
.
//Write application result to App_r here
```