

The CICS Bank Sample Application User Guide

April 2022

What is the CICS Bank Sample Application?

The CICS Bank Sample Application (CBSA) has been provided as a CICS COBOL written application based on the sort of functionality that a Bank Clerk/Teller might use. For example, they can create a new customer, open accounts for them, pay money in, withdraw money, transfer funds between accounts etc. etc.

The application has a set of BMS screens and comes fully populated with data i.e. existing accounts and customers.

CICS Bank Sample Application Architecture

The application itself runs in a CICS environment, and under the covers utilises a file containing CUSTOMER details, held on a VSAM KSDS file, with the ACCOUNT information and successfully processed transaction details held on Db2 tables.

In total there are 39 COBOL programs, 10 BMS Maps/Views, 46 Copybooks, files and Db2 tables.

The Scenario:

Originally CBSA was developed as part of the Nazare project. However, it can also be used stand alone for people wanting a pre-written CICS application to use.

When utilised as part of the Nazare project, an “enactment exercise” (called Scenario 2) has been constructed to guide the end user through changing the code to extend the functionality. For more information about the Scenario 2 exercise and details of what changes need to be made, please refer to the appropriate enacting documentation in the /doc folder.

Broadly Scenario 2 is as follows:

“The bank wishes to increase the length of the account number from 8 bytes to 9 bytes, to allow for the bank’s future expansion.”.

This will necessitate changes to some (but not all) of the programs, BMS maps, copybooks and database tables.

Accessing the CBSA application in CICS/Logging on to CICS

The CICS application and environment should be up and running, populated and ready to go. For project Nazare, log on to the CICS environment simply enter **L CICSTS56** from the equivalent logon screen (this should be similar to that shown below):

```
z/OS V2R4 LVLI PUT2009/RSU2009 IP Address = 9.171.33.86
VTAM Terminal = TCP00013

Application Developer System

      // 00000000 SSSSS
      // 00 00 SS
zzzzzz // 00 00 SS
      zz // 00 00 SSSS
      zz // 00 00 SS
      zz // 00 00 SS
zzzzzz // 00000000 SSSS

System Customization - ADCD.Z24C.*

====> Enter "LOGON" followed by the TSO userid. Example "LOGON IBMUSER" or
====> Enter L followed by the APPLID
====> Examples: "L TSO", "L CICSTS56", "L CICSTS55", "L IMS14", "L IMS15"
```

For project Nazare logon with the User Id of IBMUSER and the provided password, and hit enter:

```
Signon to CICS APPLID CICSTS5

WELCOME TO CICS TS 5.6

Type your userid and password, then press ENTER:

  Userid . . . . IBMUSER      Groupid . . . . 
  Password . . . .           -
  Language . . . . 
  New Password . . . . 

DFHCE3520 Please type your userid.
F3=Exit
```

At the 'Sign on complete' message:

```
DFHCE3549 Sign-on is complete (Language ENU).
```

Clear the screen and type OMEN and hit enter (to initiate the main menu for CICS Bank Sample Application):

```
OMEN_
```

```
BNK1MA                      CICS Bank Sample Application - Main Menu
Select an option. Then press Enter.
Action . . . . _ 1. Display/Delete/Update CUSTOMER information
                  2. Display/Delete ACCOUNT information
                  3. Create CUSTOMER
                  4. Create ACCOUNT
                  5. Update ACCOUNT
                  6. Credit/Debit funds to an ACCOUNT
                  7. Transfer funds
                  A. Look up Accounts with Customer Number

F3=Exit  F12=Cancel
```

Navigating CBSA:

CICS Bank Sample Application is driven from the main menu. Simply select the number or letter) for the function that you require.

```
BNK1MA          CICS Bank Sample Application - Main Menu
Select an option. Then press Enter.
Action . . . . _ 1. Display/Delete/Update CUSTOMER information
                  2. Display/Delete ACCOUNT information
                  3. Create CUSTOMER
                  4. Create ACCOUNT
                  5. Update ACCOUNT
                  6. Credit/Debit funds to an ACCOUNT
                  7. Transfer funds
                  A. Look up Accounts with Customer Number

F3=Exit  F12=Cancel
```

Displaying Customer information (option 1 from the main menu):

The Bank has a number of prepopulated Customers. To display the information for a customer, select option 1:

```
BNK1DC          CICS Bank Sample Application - Display Customer.
Provide a CUSTOMER number. Then press Enter.
CUSTOMER NUMBER _____
Sort Code
Customer Number
Customer Name
Customer Address

Customer D.O.B.      /    /
Credit Score
CS Review Date      /    /
```

and then enter a customer number e.g. 1234:

```
BNK1DC          CICS Bank Sample Application - Display Customer.
Provide a CUSTOMER number. Then press Enter.
CUSTOMER NUMBER 1234
Sort Code
Customer Number
Customer Name
Customer Address

Customer D.O.B.      /      /
Credit Score
CS Review Date      /      /      -

F3=Exit   F12=Cancel
```

And the details for that customer will be returned:

```
BNK1DC          CICS Bank Sample Application - Display Customer.
Provide a CUSTOMER number. Then press Enter.
CUSTOMER NUMBER 0000001234
Sort Code          987654
Customer Number    0000001234
Customer Name      Dr Ulrika W Robinson
Customer Address   65 Oak Rise, York

Customer D.O.B.    16 / 04 / 1953      -
Credit Score      057
CS Review Date    26 / 01 / 2021

Customer lookup successful. <PF5> to Delete. <PF10> to Update.
F3=Exit   F12=Cancel
```

Notice further options are displayed at the bottom of the screen. In this case, how to exit the screen (f3), how to Update the Customer details (f10) or how to Delete the Customer (f5).

Displaying Account information (option 2 from the main menu):

There are loads of prepopulated accounts belonging to customers. To display details of a single account, select option 2 (from the main menu):

```
BNK1MA          CICS Bank Sample Application - Main Menu

Select an option. Then press Enter.

Action . . . . 2 1. Display/Delete/Update CUSTOMER information
                  2. Display/Delete ACCOUNT information
                  3. Create CUSTOMER
                  4. Create ACCOUNT
                  5. Update ACCOUNT
                  6. Credit/Debit funds to an ACCOUNT
                  7. Transfer funds

                  A. Look up Accounts with Customer Number

F3=Exit  F12=Cancel
```

This gives:

```
BNK1DA          CICS Bank Sample Application - Display Account.

Provide an ACCOUNT number. Then press Enter.

ACCOUNT NUMBER _____

Customer Number:
Sort Code      :
Account Number :
Account Type   :
Interest Rate  :
Account Opened : / /
Overdraft limit:
Last statement : / /
Next statement : / /
Available Bal  :
Actual Balance :
```

and then enter an account number:

```
BNK1DA          CICS Bank Sample Application - Display Account.

Provide an ACCOUNT number. Then press Enter.

ACCOUNT NUMBER 10_____

Customer Number:
Sort Code      :
Account Number :
Account Type   :
Interest Rate  :
Account Opened : / /
Overdraft limit:
Last statement : / /
Next statement : / /
Available Bal  :
Actual Balance :
```

This returns:

```
BNK1DA          CICS Bank Sample Application - Display Account.

Provide an ACCOUNT number. Then press Enter.

ACCOUNT NUMBER  00000010

Customer Number: 0000000003
Sort Code      : 987654
Account Number : 00000010
Account Type   : CURRENT
Interest Rate  : 0000.00
Account Opened : 13 / 11 / 1970
Overdraft limit: 00000100
Last statement : 01 / 07 / 2014
Next statement : 01 / 08 / 2014
Available Bal  : +0000472807.57
Actual Balance : +0000472807.57

If you wish to delete the Account press <PF5>.
F3=Exit  F12=Cancel
```

As before, further options are displayed at the bottom of the screen.

Displaying All of the Accounts for a given Customer (option A from the main menu):

To see what accounts a particular Customer has select option A from the main menu:

```
BNK1MA          CICS Bank Sample Application - Main Menu

Select an option. Then press Enter.

Action . . . . A 1. Display/Delete/Update CUSTOMER information
                  2. Display/Delete ACCOUNT information
                  3. Create CUSTOMER
                  4. Create ACCOUNT
                  5. Update ACCOUNT
                  6. Credit/Debit funds to an ACCOUNT
                  7. Transfer funds

                  A. Look up Accounts with Customer Number

F3=Exit  F12=Cancel
```

and provide the Customer number:


```
BNK1ACC      CICS Bank Sample Application - Accounts for Customers.
Provide a Customer number. Then press Enter.
CUSTOMER NUMBER 3_____

SORT CODE    ACCOUNT NUMBER    ACCOUNT TYPE    AVAIL BALANCE    ACTUAL BALANCE

F3=Exit      F12=Cancel
```

```
BNK1ACC      CICS Bank Sample Application - Accounts for Customers.
Provide a Customer number. Then press Enter.
CUSTOMER NUMBER 0000000003

SORT CODE    ACCOUNT NUMBER    ACCOUNT TYPE    AVAIL BALANCE    ACTUAL BALANCE
987654       000000008      ISA            +0000147844.16   +0000147844.16
987654       000000009      SAVING        +0000894130.24   +0000894130.24
987654       000000010      CURRENT       +0000472807.57   +0000472807.57

3 accounts found
F3=Exit      F12=Cancel
```

In this example Customer 3 has 3 accounts (ISA, SAVING, CURRENT) which all hold different balances.

Creating a New Customer (option 3 from the main menu):

To create a new Customer, select option 3 from the main menu:

```
BNK1MA          CICS Bank Sample Application - Main Menu

Select an option. Then press Enter.

Action . . . . 3 1. Display/Delete/Update CUSTOMER information
                  2. Display/Delete ACCOUNT information
                  3. Create CUSTOMER
                  4. Create ACCOUNT
                  5. Update ACCOUNT
                  6. Credit/Debit funds to an ACCOUNT
                  7. Transfer funds
<               A. Look up Accounts with Customer Number >

F3=Exit  F12=Cancel
```

This gives:

```
BNK1CC          CICS Bank Sample Application - Create Customer.

Provide a Name, Address and D.O.B. then Enter

Customer Title  _____ First Name  _____
Middle Initials  _  Family name  _____

Customer Addr1  _____
Customer Addr2  _____
Customer Addr3  _____
Customer D.O.B.  _ / _ / _

Sort Code
Customer Number
Credit Score
CS Review Date   /   /

F3=Exit  F12=Cancel
```

Then supply the required information:

```
BNK1CC          CICS Bank Sample Application - Create Customer.

Provide a Name, Address and D.O.B. then Enter

Customer Title  Mr _____ First Name  Ronald _____
Middle Initials  _  Family name  Newman _____

Customer Addr1  123 Beech Avenue, Tring _____
Customer Addr2  _____
Customer Addr3  _____
Customer D.O.B. 01 / 01 / 1961

Sort Code
Customer Number
Credit Score
CS Review Date   /   /

F3=Exit  F12=Cancel
```

Validation will guide you through what content is acceptable or not, on a field by field basis.

Once the information provided has passed the validation check a new Customer Number, Sort Code and Credit Score will be returned.

```
BNK1CC          CICS Bank Sample Application - Create Customer.
Provide a Name, Address and D.O.B. then Enter

Customer Title  Mr          First Name  Ronald
Middle Initials  Family name Newman

Customer Addr1  123 Beech Avenue, Tring
Customer Addr2
Customer Addr3
Customer D.O.B. 01 / 01 / 1961

Sort Code       987654
Customer Number 0000010003
Credit Score    553
CS Review Date  23 / 01 / 2021

The Customer record has been successfully created
F3=Exit  F12=Cancel
```

Creating a New Account (option 4 from the main menu):

To create a new Account, select option 4 from the main menu:

```
BNK1MA          CICS Bank Sample Application - Main Menu
Select an option. Then press Enter.

Action . . . . 4 1. Display/Delete/Update CUSTOMER information
                  2. Display/Delete ACCOUNT information
                  3. Create CUSTOMER
                  4. Create ACCOUNT
                  5. Update ACCOUNT
                  6. Credit/Debit funds to an ACCOUNT
                  7. Transfer funds
                  A. Look up Accounts with Customer Number

F3=Exit  F12=Cancel
```

```

BNK1CA          CICS Bank Sample Application- Create Account.

Please provide the requested information and press Enter.

Customer number  : _____
Account Type    : _____
Interest Rate   : 0000.00
Overdraft Limit : 0

Account number  : _____
Sort code      : _____
Account Opened  :      /      /
Last Stmt Date :      /      /
Next Stmt Date :      /      /
Available Balance: _____
Actual Balance  : _____

F3=Exit  F12=Cancel

```

Assign a Customer Number that the new Account relates to, an Account Type which can be MORTGAGE, SAVINGS, ISA, LOAN or CURRENT. Enter an interest rate that is applicable to that account, and any overdraft amount applicable to that account (in whole pounds) and hit enter.

The details get validated, with suitable messages returned if a field needs to be modified:

```

BNK1CA          CICS Bank Sample Application- Create Account.

Please provide the requested information and press Enter.

Customer number  : 0000000003
Account Type    : _____
Interest Rate   : 0000.00
Overdraft Limit : 0

Account number  : _____
Sort code      : _____
Account Opened  :      /      /
Last Stmt Date :      /      /
Next Stmt Date :      /      /
Available Balance: _____
Actual Balance  : _____

Account Type should be ISA,CURRENT,LOAN,SAVING or MORTGAGE
F3=Exit  F12=Cancel

```

Once the details pass validation, information about the new account is returned (e.g. the allocated Account number, etc.):

```
BNK1CA          CICS Bank Sample Application- Create Account.

Please provide the requested information and press Enter.

Customer number  : 0000000003
Account Type     : MORTGAGE
Interest Rate    : 0005.25
Overdraft Limit  : 00000000

Account number   : 00024985
Sort code       : 987654
Account Opened  : 21 / 01 / 2021
Last Stmt Date  : 21 / 01 / 2021
Next Stmt Date  : 20 / 02 / 2021
Available Balance : +0000000000.00
Actual Balance  : +0000000000.00

The Account has been successfully created
F3=Exit  F12=Cancel
```

Update Account Information (option 5 from the main menu):

To update the details of an existing Account, select option 5 from the main menu:

```
BNK1MA          CICS Bank Sample Application - Main Menu

Select an option. Then press Enter.

Action . . . . 5 1. Display/Delete/Update CUSTOMER information
                  2. Display/Delete ACCOUNT information
                  3. Create CUSTOMER
                  4. Create ACCOUNT
                  5. Update ACCOUNT
                  6. Credit/Debit funds to an ACCOUNT
                  7. Transfer funds
                  A. Look up Accounts with Customer Number

F3=Exit  F12=Cancel
```

```
BNK1UA          CICS Bank Sample Application - Update Account.

Please provide an ACCOUNT number.

ACCOUNT NUMBER  _____

Customer Number:
Sort Code      :
Account Number :
Account Type   : _____
Interest Rate  : _____
Account Opened : _____ / _____ / _____
Overdraft limit: _____
Last statement : _____ / _____ / _____
Next statement : _____ / _____ / _____
Available Bal  :
Actual Balance :

F3=Exit  F12=Cancel
```

and provide the account number:

```
BNK1UA          CICS Bank Sample Application - Update Account.

Please provide an ACCOUNT number.

ACCOUNT NUMBER  24985_____

Customer Number:
Sort Code      :
Account Number :
Account Type   : _____
Interest Rate  : _____
Account Opened : _____ / _____ / _____
Overdraft limit: _____
Last statement : _____ / _____ / _____
Next statement : _____ / _____ / _____
Available Bal  :
Actual Balance :

F3=Exit  F12=Cancel
```

This displays the account details:

```
BNK1UA          CICS Bank Sample Application - Update Account.

Please provide an ACCOUNT number.

ACCOUNT NUMBER  00024985_____

Customer Number: 0000000003
Sort Code       : 987654
Account Number  : 00024985
Account Type    : MORTGAGE
Interest Rate   : 0005.25
Account Opened  : 21 / 01 / 2021
Overdraft limit: 00000000
Last statement  : 21 / 01 / 2021
Next statement  : 20 / 02 / 2021
Available Bal   : +0000000000.00
Actual Balance  : +0000000000.00

Please amend fields and hit <pf5> to apply changes
F3=Exit  F12=Cancel
```

In this case the Account Type, the Interest Rate and the Overdraft Limit are the 3 fields which may be amended:

```

BNK1UA          CICS Bank Sample Application - Update Account.

Please provide an ACCOUNT number.

ACCOUNT NUMBER  00024985

Customer Number: 0000000003
Sort Code       : 987654
Account Number  : 00024985
Account Type    : ISA
Interest Rate   : 0000.10
Account Opened  : 21 / 01 / 2021
Overdraft limit: 00000000
Last statement  : 21 / 01 / 2021
Next statement  : 20 / 02 / 2021
Available Bal   : +0000000000.00
Actual Balance  : +0000000000.00

Please amend fields and hit <pf5> to apply changes
F3=Exit  F12=Cancel

```

This example amends the Account Type and Interest Rate, then simply press pf5 to apply the changes:

```

BNK1UA          CICS Bank Sample Application - Update Account.

Please provide an ACCOUNT number.

ACCOUNT NUMBER  00024985

Customer Number: 0000000003
Sort Code       : 987654
Account Number  : 00024985
Account Type    : ISA
Interest Rate   : 0000.10
Account Opened  : 21 / 01 / 2021
Overdraft limit: 00000000
Last statement  : 21 / 01 / 2021
Next statement  : 20 / 02 / 2021
Available Bal   : +0000000000.00
Actual Balance  : +0000000000.00

Account update successfully applied.
F3=Exit  F12=Cancel

```

Credit and Debit funds to an Account (option 6 from the main menu):

To credit (pay in) or debit (withdraw) funds from an Account, use option 6 from the main menu:

```
BNK1MA          CICS Bank Sample Application - Main Menu

Select an option. Then press Enter.

Action . . . . 6 1. Display/Delete/Update CUSTOMER information
                  2. Display/Delete ACCOUNT information
                  3. Create CUSTOMER
                  4. Create ACCOUNT
                  5. Update ACCOUNT
                  6. Credit/Debit funds to an ACCOUNT
                  7. Transfer funds
<              A. Look up Accounts with Customer Number >

F3=Exit  F12=Cancel
```

```
BNK1CD          CICS Bank Sample Application - Credit/Debit Funds.

Provide an ACCOUNT number and an AMOUNT and then press Enter.

ACCOUNT NUMBER: _____ AMOUNT:  + 0000000000.00

Sort Code:
Available Balance:
Actual Balance:

F3=Exit  F12=Cancel
```

and provide the account number and either + (for credit) or – (for debit) followed by the amount:

```
BNK1CD          CICS Bank Sample Application - Credit/Debit Funds.

Provide an ACCOUNT number and an AMOUNT and then press Enter.

ACCOUNT NUMBER: 24985 AMOUNT:  + 0000012345.00

Sort Code:
Available Balance:
Actual Balance:

F3=Exit  F12=Cancel
```

Then press enter:


```
BNK1CD          CICS Bank Sample Application - Credit/Debit Funds.

Provide an ACCOUNT number and an AMOUNT and then press Enter.

ACCOUNT NUMBER: 00024985 AMOUNT: + 0000012345.00

Sort Code:      987654
Available Balance: +0000012345.00
Actual Balance:  +0000012345.00

Amount successfully applied to the account.
F3=Exit  F12=Cancel
```

Transfer funds between Accounts (option 7 from the main menu):

To transfer funds between accounts, use option 7 from the main menu:

```
BNK1MA          CICS Bank Sample Application - Main Menu

Select an option. Then press Enter.

Action . . . . 7 1. Display/Delete/Update CUSTOMER information
                  2. Display/Delete ACCOUNT information
                  3. Create CUSTOMER
                  4. Create ACCOUNT
                  5. Update ACCOUNT
                  6. Credit/Debit funds to an ACCOUNT
                  7. Transfer funds
<               A. Look up Accounts with Customer Number >

F3=Exit  F12=Cancel
```

```
BNK1TF          CICS Bank Sample Application - Transfer funds.

Provide a FROM account, a TO account and an Amount and press Enter.

FROM Account Number:      TO Account Number:
AMOUNT:                   0000000000.00

FROM Account   :          TO Account   :
Sort Code     :          Sort Code     :
Actual Balance :          Actual Balance :
Avail Balance  :          Avail Balance  :

F3=Exit  F12=Cancel
```

The transfer can be for accounts held by the same or different customers. Simply enter the FROM account number, the TO account number and the amount you wish to transfer:

```
BNK1TF          CICS Bank Sample Application - Transfer funds.

Provide a FROM account, a TO account and an Amount and press Enter.

FROM Account Number: 24985 TO Account Number: 1
AMOUNT:              0000000050.00

FROM Account   :          TO Account   :
Sort Code     :          Sort Code     :
Actual Balance :          Actual Balance :
Avail Balance  :          Avail Balance  :

F3=Exit  F12=Cancel
```

Then press enter:

```
BNK1TF          CICS Bank Sample Application - Transfer funds.
Provide a FROM account, a TO account and an Amount and press Enter.

FROM Account Number: 00024985 TO Account Number: 00000001
AMOUNT: 0000000050.00

FROM Account   : 00024985      TO Account   : 00000001
Sort Code     : 987654        Sort Code     : 987654
Actual Balance : +0000012295.00 Actual Balance : +0000848200.41
Avail Balance  : +0000012295.00 Avail Balance  : +0000848200.41

Transfer successfully applied.
F3=Exit  F12=Cancel
```

Upon a successful transfer the balances of the FROM and TO accounts will be shown.

All successfully enacted transactions are updated in real time, and details of all successful transactions (apart from Account and Customer inquiries) are recorded on the PROCTRAN table (PROCTRAN=Details of successfully processed transactions).

The enactment scenario 1 will amend some of these screens/BMS maps and their associated underlying programs and copybooks.

Files and libraries in z/OS

There source code is provided in the GitHub repo in the `/cobol` folder, the copybooks can be found in the `/copylib` folder and the bms source in the `/bms` folder.

Full enactment instructions are provided in the enactment document.

IMPORTANT NOTE - The environment and the CBSA application are preloaded with data and ready to use.

Accessing z/OS via TSO

You will be asked to submit some provided JCL as you work your way through the enactment instructions/exercise, you can do this via TSO (details are provided in the instructions).

For the Nazare project - to access z/OS/TSO you will need to sign into TSO. Go to the logon screen, which should be similar to that shown below, and enter L TSO:

```

z/OS V2R3 LVLI PUT1803/RSU1803 IP Address = 10.1.1.1
VTAM Terminal = SC0TCP03

Application Developer System

      // 0000000 SSSSS
      // 00 00 SS
zzzzzz // 00 00 SS
      zz // 00 00 SSSS
      zz // 00 00 SS
      zz // 00 00 SS
zzzzzz // 0000000 SSSS

System Customization - ADCD.Z23B.*

===> Enter "LOGON" followed by the TSO userid. Example "LOGON IBMUSER" or
===> Enter L followed by the APPLID
===> Examples: "L TSO", "L CICSTS53", "L CICSTS54", "L IMS14", "L IMS15"

L TSO_

```

And when prompted enter the provided USER ID :

```

IKJ56700A ENTER USERID -
IBMUSER_

```

Followed by password that will have been provided:

```

----- TS0/E LOGON -----

Enter LOGON parameters below:                                RACF LOGON parameters:

Userid    ===> IBMUSER
Password  ===> _
Procedure ===> DBSPROCC
Acct Nmbr ===> ACCT#
Size      ===> 2096128
Perform   ===>
Command   ===> ISPF

Enter an 'S' before each option desired below:
      -Nomail      -Nonotice      -Reconnect      -OIDcard

PF1/PF13 ==> Help    PF3/PF15 ==> Logoff    PA1 ==> Attention    PA2 ==> Reshow
You may request specific help information by entering a '?' in any entry field

```