



Legac-E Education

Frequently Asked Questions (FAQ) Application



Legac-E Education

Exploiting the CICS/Batch Interface (EXCI)

Topics	Page
<i>Introduction</i> _____	<i>1</i>
<i>FAQ Logic</i> _____	<i>2</i>
<i>The Assembler Question Table</i> _____	<i>7</i>
<i>The URL File</i> _____	<i>10</i>
<i>Initial FAQ WEB Page</i> _____	<i>11</i>



Frequently Asked Questions (FAQ) Application

Introduction

The first Frequently Asked Questions (FAQ) Application was written in JavaScript for the original KMS-IT Limited WEB site. This was both unsophisticated and heavy weight given that all code and tables had to be transmitted to the Client Browser.

Once the Legac-e Education WEB site was being hosted via z/OS and CICS/TS a redesign of the FAQ Application was undertaken, using CICS/TS as the Server with COBOL providing the logic.

The application comprised the following components:

- A COBOL program to perform the search based on the criteria supplied from the WEB page.
- An Assembler table containing perceived questions and keys to a VSAM file.
- A VSAM KSDS cluster holding URL references with key references being held in the Assembler Table.
- A CICS managed File Table to improve access to the KSDS cluster.
- Two HTML pages one built dynamically and the other held in a z/OS UNIX System Services folder.

The revised version was no more sophisticated than the JavaScript original but was more light weight at the Client end.

The application ultimately ran on a CICS/TS 5.1 system as that was the last one in service at the time of the company closure.



Legac-E Education

Frequently Asked Questions (FAQ) Application

FAQ Logic

This program was invoked via the ACTION keyword within an HTML FORM, and its function was to:

- Accept the search criteria from the Browser
- Load the Assembler Table as required
- Search the Assembler Table for questions with matching criteria
- Use the key value of each question to retrieve the appropriate URL record from the KSDS cluster
- Dynamically build a WEB page containing up to 10 responses which comprised both a question and the URL to its associated answer page,
- Return the WEB page to the Client Browser.

The code

```
IDENTIFICATION DIVISION.  
PROGRAM-ID.                                FAQSPGM.  
ENVIRONMENT DIVISION.  
DATA DIVISION.  
WORKING-STORAGE SECTION.  
01 DUMP-MARKER                             PIC X(32) VALUE  
   'WORKING STORAGE STARTS HERE'.  
01 VARIOUS-BINARY-FIELDS.  
   03 DSIZE                                 PIC S9(8) COMP.  
   03 WS-RESP                               PIC S9(8) COMP.  
   03 WS-RESP2                             PIC S9(8) COMP.  
   03 B-LEN                                 PIC S9(8) COMP VALUE +0.  
   03 WEBN-LEN                              PIC S9(8) COMP VALUE +6.  
   03 WEBV-LEN                              PIC S9(8) COMP VALUE +20.  
   03 WS-SUB                                PIC S9(4) COMP VALUE +1.  
   03 P-SUB                                 PIC S9(4) COMP VALUE +1.  
   03 S-NUM                                 PIC S9(4) COMP VALUE +0.  
   03 S-ARGL                               PIC S9(4) COMP VALUE +0.  
   03 R-NUM                                 PIC S9(4) COMP VALUE +0.  
   03 Q-TABL                               PIC S9(4) COMP VALUE +0.  
   03 U-LEN                                 PIC S9(4) COMP VALUE +0.  
   03 Q-LEN                                 PIC S9(4) COMP VALUE +0.
```



Frequently Asked Questions (FAQ) Application

```
01  VARIOUS-NON-BINARY-FIELDS.
03  DTOKEN          PIC X(16).
03  WEBARG          PIC X(6) VALUE 'WEBARG'.
03  S-ARG1          PIC X(20) VALUE SPACES.
03  S-ARG2          REDEFINES S-ARG1.
05  ARG-CHAR       PIC X OCCURS 20.
03  S-FAIL         PIC XX  VALUE SPACES.
03  M-NUM          PIC ZZZ9.
03  PB-PTR         PIC S9(4) VALUE +1.
03  HQ-TEXT        PIC X(80).
03                REDEFINES HQ-TEXT.
05  Q-CHAR         PIC X OCCURS 80 TIMES.
03  FAQHDR         PIC X(40) VALUE 'FAQHDR'.
01  URL-REC.
03  URL-KEY        PIC XXX.
03  URL-VAL        PIC X(77).
03                REDEFINES URL-VAL.
05  U-CHAR         PIC X OCCURS 77 TIMES.
01  PAGE-TRL.
03                PIC X(31) VALUE
'</div></div></div></body><html>'.
01  PAGE-BODY      PIC X(4800).
COPY DFHAID.
LINKAGE SECTION.
01  DFHCOMMAREA   PIC X(256).
01  FAQ-TABLE.
03  Q-NUM         PIC S9(4) COMP.
03  FAQ-LINE      OCCURS 1 TO 10 TIMES
DEPENDING ON Q-NUM.
05  URL-NO        PIC 999.
05  Q-TEXT        PIC X(80).
*-----*
*   Program logic starts here.   *
*-----*
PROCEDURE DIVISION.
START-RTN SECTION.
*-----*
*   Extract the SEARCH argument from WEB page.   *
*-----*
EXEC CICS WEB READ          FORMFIELD(WEBARG)
                           NAMELENGTH(WEBN-LEN)
                           VALUE(S-ARG1)
                           VALUELENGTH(WEBV-LEN)
                           RESP(W-RESP)
                           RESP2(W-RESP2)
                           END-EXEC.
IF S-ARG1 = SPACES        OR WEBV-LEN = 0
STRING '<p><b>** No search '
      'argument **</b></p>'
      DELIMITED BY SIZE
      INTO PAGE-BODY
END-STRING
```



Frequently Asked Questions (FAQ) Application

```

                                ADD +38 TO B-LEN
ELSE PERFORM MAIN-PROGRAM.
*-----*
*   Now build the BODY of the response HTML Page.   *
*-----*
EXEC CICS DOCUMENT CREATE      DOCTOKEN(DTOKEN)
                                TEMPLATE('FAQHDR')
                                DOCSIZE(DSIZE)
                                RESP(WS-RESP)
                                END-EXEC.
EXEC CICS DOCUMENT INSERT      DOCTOKEN(DTOKEN)
                                FROM(PAGE-BODY)
                                LENGTH(B-LEN)
                                DOCSIZE(DSIZE)
                                RESP(WS-RESP)
                                END-EXEC.
EXEC CICS DOCUMENT INSERT      DOCTOKEN(DTOKEN)
                                FROM(PAGE-TRL)
                                LENGTH(LENGTH OF PAGE-TRL)
                                DOCSIZE(DSIZE)
                                RESP(WS-RESP)
                                END-EXEC.
EXEC CICS WEB SEND              DOCTOKEN(DTOKEN)
                                CLNTCODEPAGE('ISO-8859-1')
                                END-EXEC.
*-----*
*   Logical end of program, return to CICS.           *
*-----*
STRT-RTN-EXIT.
EXEC CICS RETURN                END-EXEC.

MAIN-PROGRAM SECTION.
PERFORM VARYING                  WS-SUB FROM 1 BY 1
                                UNTIL WS-SUB > 20
IF ARG-CHAR (WS-SUB) = SPACE MOVE +21 to WS-SUB
ELSE                              ADD +1 TO S-ARGL
END-IF
END-PERFORM.
*-----*
*   Locate and address the Question Table.           *
*-----*
EXEC CICS LOAD                   PROGRAM('FAQSTAB')
                                SET(ADDRESS OF FAQ-TABLE)
                                LENGTH(Q-TABL)
                                END-EXEC.
*-----*
*   Use the SEARCH argument to locate possible questions and *
*   URL's containing appropriate responses.           *
*-----*
STRING '<p><b>** Search Results **</b></p><br>'
                                DELIMITED BY SIZE
                                INTO PAGE-BODY
```




Legac-E Education

Frequently Asked Questions (FAQ) Application

```

ADD +1
PERFORM VARYING
    INSPECT Q-TEXT (WS-SUB)
    IF S-NUM > 0
        WITH POINTER PB-PTR
        ADD +38 TO B-LEN.
        TO P-SUB.
        WS-SUB FROM 1 BY 1
        UNTIL WS-SUB > Q-NUM
        TALLYING S-NUM
        FOR ALL S-ARG1(1:S-ARGL)
        MOVE 'OK' TO S-FAIL
        EXEC CICS READ FILE('URLFILE')
            RIDFLD(URL-NO (WS-SUB))
            INTO(URL-REC)
            RESP(WS-RESP)
            RESP2(WS-RESP2)
            END-EXEC
        PERFORM VARYING U-LEN FROM 1 BY 1
            UNTIL U-CHAR (U-LEN) = '>'
            END-PERFORM
        MOVE Q-TEXT (WS-SUB) TO HQ-TEXT
        PERFORM VARYING Q-LEN FROM 1 BY 1
            UNTIL Q-CHAR (Q-LEN) = '?'
            END-PERFORM
        STRING URL-VAL(1:U-LEN)
            DELIMITED BY SIZE
            INTO PAGE-BODY
            POINTER PB-PTR
        END-STRING
        ADD U-LEN TO B-LEN
        STRING HQ-TEXT (1:Q-LEN)
            DELIMITED BY SIZE
            INTO PAGE-BODY
            POINTER PB-PTR
        END-STRING
        ADD Q-LEN TO B-LEN
        STRING '</a><br><br>'
            DELIMITED BY SIZE
            INTO PAGE-BODY
            POINTER PB-PTR
        END-STRING
        ADD +12 TO B-LEN
        ADD +1 TO P-SUB
        TO S-NUM
        STRING '<p><b>** String '
            S-ARG1(1:S-ARGL)
            ' not found **</b></p>'
            DELIMITED BY SIZE
            INTO PAGE-BODY
        END-STRING
        COMPUTE B-LEN = (S-ARGL + 37)
        SUBTRACT +2 FROM P-SUB
        GIVING WS-SUB
    ELSE
        END-IF
    MOVE +0
    END-PERFORM.
    IF S-FAIL = SPACES
        ELSE

```



Legac-E Education

Frequently Asked Questions (FAQ) Application

```
MOVE WS-SUB TO M-NUM
STRING '<p><b>** ' M-NUM
      DELIMITED BY SIZE
      INTO PAGE-BODY
      POINTER PB-PTR
END-STRING
STRING
  ' Matches found **</b></p>'
  DELIMITED BY SIZE
  INTO PAGE-BODY
  POINTER PB-PTR
END-STRING
ADD +38 TO B-LEN.

MAIN-PROGRAM-EXIT.
  EXIT.
*-----*
*   The physical end of program FAQSPGM.   *
*-----*
```



Frequently Asked Questions (FAQ) Application

The Assembler Question Table

```
FAQSTAB  CSECT
NUMQ     EQU     FAQSEND-FAQSLIST
QLEN     EQU     83
QNUM     DC      AL2(NUMQ/QLEN)                NO OF QUESTIONS
*-----*
*      Question Table format is as follows:      *
*      URL Number - in first three bytes        *
*      Question   - in the remaining bytes of the entry. *
*-----*
*      Note that the last character of any question MUST BE ? *
*      Additional search keywords can be added after the ? *
*-----*
FAQSLIST DS 0C
Q000     DC CL3'000',CL80'What is Binary to Decimal conversion? - As*
          sembler '
Q001     DC CL3'nnn',CL80' '
Q002     DC CL3'002',CL80'What is Decimal to Binary conversion? - As*
          sembler '
Q003     DC CL3'003',CL80'What is Decimal to Hexadecimal conversion? *
          - Assembler'
Q004     DC CL3'004',CL80'Which manual describes Assembler instructi*
          ons such as CSECT and DSECT?'
Q005     DC CL3'005',CL80'Which manual describes Assembler I/O Macro*
          s?'
Q006     DC CL3'006',CL80'Which manual describes Assembler (Machine)*
          instructions such as L, AR, ST, etc?'
Q007     DC CL3'007',CL80'Which manual describes Assembler System Se*
          rvices Macros?'
Q008     DC CL3'008',CL80'What is two''s compliment? - Assembler'
Q009     DC CL3'009',CL80'What does batch TSO JCL look like? - IKJEF*
          T01'
Q010     DC CL3'010',CL80'How can I concatenate different LRECLs? - *
          IEBDG'
Q011     DC CL3'nnn',CL80' '
Q012     DC CL3'012',CL80'How can I check for a non-existent data se*
          t? - IDCAMS'
Q013     DC CL3'013',CL80'How can I check the contents of a CICS VSA*
          M data set? - CECI'
Q014     DC CL3'014',CL80'How do I define the IBM Supplied sample FI*
          LEA for CICS? - CEDA'
Q015     DC CL3'015',CL80'How can I produced a data set with a guar*
          nteed EOF? - IEBGENER IDCAMS'
Q016     DC CL3'nnn',CL80' '
Q017     DC CL3'017',CL80'How can I include date and/or time in a DS*
          N? - REXX INCLUDE'
Q018     DC CL3'018',CL80'How can I enlarge a VSAM LRECL using IEBGE*
          NER?'
Q019     DC CL3'019',CL80'How can I split a file? - IDCAMS'
Q020     DC CL3'020',CL80'How can I create a GDG from within REXX?'
```



Frequently Asked Questions (FAQ) Application

- Q021 DC CL3'021',CL80'How can I delete a GDG and its associations? - IDCAMS'
- Q022 DC CL3'022',CL80'How can I rename a GDG? - REXX'
- Q023 DC CL3'023',CL80'How can I perform a global change on a dataset? - IKJEFT01 TSO EDIT'
- Q024 DC CL3'024',CL80'How to pass parameters to a program from within REXX - LINKMVS?'
- Q025 DC CL3'025',CL80'How to pass parameters to a program from within REXX - LINKPGM?'
- Q026 DC CL3'026',CL80'How can individual members of a PDS or PDSE be extended? - REXX'
- Q027 DC CL3'027',CL80'Is it possible to calculate the number of records in a file? - REXX'
- Q028 DC CL3'028',CL80'How do I allocate a PDSE with IDCAMS?'
- Q029 DC CL3'029',CL80'How do I allocate a PDSE with IEFBR14?'
- Q030 DC CL3'030',CL80'How to deal with missing members? - IDCAMS'
- Q031 DC CL3'031',CL80'How to create a generic file reader utility? - PLI'
- Q032 DC CL3'032',CL80'How to check for and allocate a dataset? - IDCAMS'
- Q033 DC CL3'033',CL80'How do I allocate a PDSE with IEBUPDTE?'
- Q034 DC CL3'034',CL80'Can I allocate and copy a file dynamically? - IDCAMS'
- Q035 DC CL3'035',CL80'How do I split a record using IEBGENER?'
- Q036 DC CL3'036',CL80'How do I split a record using REXX in batch?'
- Q037 DC CL3'037',CL80'What do mainframe numbers look like? - Assembler'
- Q038 DC CL3'038',CL80'What is IDCAMS? - Utilities'
- Q039 DC CL3'039',CL80'What is IEBCOMPR? - Utilities SuperC'
- Q040 DC CL3'040',CL80'What is IEBCOPY? - Utilities'
- Q041 DC CL3'041',CL80'What is IEBDG? - Utilities'
- Q042 DC CL3'042',CL80'What is IEBEDIT? - Utilities'
- Q043 DC CL3'043',CL80'What is IEBGENER? - Utilities'
- Q044 DC CL3'nnn',CL80' '
- Q045 DC CL3'045',CL80'What is IEBTPCH? - Utilities'
- Q046 DC CL3'046',CL80'What is IEBUPDTE? - Utilities'
- Q047 DC CL3'047',CL80'What is IEFBR14? - Utilities'
- Q048 DC CL3'048',CL80'What is IEHLIST? - Utilities'
- Q049 DC CL3'049',CL80'What is IEHMOVE? - Utilities'
- Q050 DC CL3'050',CL80'What is IEHPROGM? - Utilities'
- Q051 DC CL3'051',CL80'What is IKJEFT01? - Utilities'
- Q052 DC CL3'052',CL80'What is abnormal termination? - ABTERMabend'
- Q053 DC CL3'053',CL80'How do I delete a dataset? - IEFBR14 IDCAMS'
- Q054 DC CL3'054',CL80'What is the hexadecimal collating sequence? - Assembler'
- Q055 DC CL3'055',CL80'How to migrate a PDS to a PDSE? - IEBCOPY allocate'



Frequently Asked Questions (FAQ) Application

```
Q056      DC CL3'056',CL80'Why not 32-bit addressing? - Assembler'  
Q057      DC CL3'057',CL80'How to compress a PDS? - IEBCOPY'  
Q058      DC CL3'058',CL80'How do instructions differ across addressi*  
           ng modes? - Assembler'  
Q059      DC CL3'059',CL80'How do I capture JES2 output in SDSF?'  
Q060      DC CL3'060',CL80'Can I display General Purpose Register (GP*  
           R) contents in Assembler?'  
Q061      DC CL3'061',CL80'What 's the capacity of a 3390 disk? - Har*  
           dware'  
Q062      DC CL3'062',CL80'What does a PDS(E) directory look like? -B*  
           PAM'  
Q063      DC CL3'063',CL80'What is an IBG? - disk cartridge tape'  
Q064      DC CL3'064',CL80'What is a BLKSIZE? - disk cartridge tape'  
Q065      DC CL3'065',CL80'What is a RECFM? - record format'  
Q066      DC CL3'066',CL80'What is packed decimal? - COMP-3 '  
Q067      DC CL3'067',CL80'What are Data Organisations? - DSORG BDAM *  
           BPAM BSAM QSAM VSAM ESDS KSDS RRDS'  
Q068      DC CL3'068',CL80'Why do messages look the way they do?'  
Q069      DC CL3'069',CL80'What is meant by Standard Labels? - tape c*  
           artridge'  
Q070      DC CL3'070',CL80'What 's the difference between TRT and SRS*  
           T? - Assembler search find'  
Q071      DC CL3'071',CL80'How can I create test data? - IEBDG'  
Q072      DC CL3'072',CL80'How can I enlarge a given LRECL using IEBD*  
           G? '  
Q073      DC CL3'073',CL80'How can I enlarge a given LRECL using IEBG*  
           ENER? '  
Q074      DC CL3'074',CL80'Is LISTDSI information reliable? - REXX, T*  
           SO '  
Q075      DC CL3'075',CL80'What are Data Structures? - Assembler, COB*  
           OL, PLI '  
Q076      DC CL3'076',CL80'Can REXX code be executed inline? - TSO '  
Q077      DC CL3'077',CL80'Can I read a PDS directory in COBOL? '  
Q078      DC CL3'078',CL80'Can I read a PDS directory in PLI? '  
Q079      DC CL3'079',CL80'Can I read a PDS directory in REXX? '  
Q080      DC CL3'080',CL80'How to Unload a PDS(E) using a High Level *  
           Language?- COBOL, REXX '  
FAQSEND  DS 0C                               The end of the questions.  
          END
```



Legac-E Education

Frequently Asked Questions (FAQ) Application

The URL File

This was a simple VSAM KSDS cluster with 80-byte records.

The first three bytes of each record held the key value which matched a question number in the Assembler table. The remaining 77 bytes would hold the URL of an HTML page containing information relating to the question.

To improve performance of the application the cluster was coupled to a CICS managed File Table capable of holding fifty percent of the records.



Legac-E Education

Frequently Asked Questions (FAQ) Application

Initial FAQ WEB Page

This page and all answer pages were stored in z/OS UNIX System Services.

```
<!DOCTYPE html PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN"
"http://www.w3.org/TR/html4/loose.dtd">
<head>
<meta http-equiv="Content-Language" content="en-gb" >
<meta http-equiv="Content-Type" content="text/html;
charset=windows-1252" >
<meta name="keywords" content="keywords" >
<link rel="stylesheet" type="text/css" href="css/formatting.css" >
<link rel="stylesheet" type="text/css" href="css/layout.css" >
<title>Legace ICT - Query Page</title>
</head>
<body>
<div style='border : 1px solid #808080; padding : 5px; height : 95%;
width : 95%; background : black; text-align : left; margin-
right:auto; margin-left:auto;'>
<div id="header">
<div id="nav1"></div>
<div id="title">
<p class="titletext">The Legac-e Education Learning Zone</p>
<span class="strap">Frequently Asked Questions</span></div>
<div id="nav2"><a class="topnavi" href="index.html">Home</a></div>
<div id="nav3"><a class="topnavi" href="aboutus.html">About</a></div>
<div id="nav4"><a class="topnavi" href="news.html">News</a></div>
<div id="nav5"><a class="topnavi" href="faq.html">FAQ</a></div>
<div id="nav6"><a class="topnavi"
href="contact.html">Contact</a></div>
</div>
<div id="leftcontainer">
<p class="leftheading">Enter a single word query below and
press the ENTER key to search.
<br><br>(NOTE - This is case sensitive)</b></p><br>
<form name="myQuery" method=post
action="http://www.legac-e.co.uk/faq">
<input type=TEXT NAME="WEBARG" size=20 maxlength=20>
</form><br>
<p class="leftheading">Example arguments:</p><ul>
<li>allocate
<li>Assembler
<li>Any Utility name
<li>Binary
<li>CICS
<li>COBOL
<li>Decimal
<li>enlarge
<li>expand
<li>file
<li>GDG
```



Legac-E Education

Frequently Asked Questions (FAQ) Application

```
<li>Hex
<li>number
<li>PDS
<li>PLI
<li>record
<li>REXX
<li>VSAM
</ul>
</div>
<div id="maincontent">
<div id="textcontent" style="width: 429px; height: 185px;
padding-right : 5px">
<p>Up until September 2013 our Frequently Asked Questions pages were
driven by JavaScript using a
number of arrays to assist search capability.<br><br>
This has now been changed to use a server facility based on IBM's
z/OS Operating System and
using CICS/TS as the actual WEB Server.<br><br>
The actual is incorporated in a COBOL program, which searches an in-
core table of questions,
from which it extracts a corresponding URL number. The URL number
provides a key to a VSAM KSDS
file holding the URLs which relate to the selected questions.<br><br>
To aid performance the KSDS file is fronted by a CICS Data
Table.<br><br>
The COBOL program constructs the HTML response and returns it to the
WEB Browser.</p><br>
<p>The rationale for switching from JavaScript to the current
solution was to demonstrate that as
an Education Provider, we actually practice the techniques we
teach.</p>
</div>
</div>
</div>
<div id="footcontainer">
<div id="foot1">
<a target="_blank" class="footer"
href="http://validator.w3.org/check/referer">HTML 4.01</a>
<font face="Arial" color="#FFFFFF">|</font>
<a class="footer" target="_blank" href="http://jigsaw.w3.org/css-
validator/check/referer?warning=no&amp;profile=css2">CSS 2</a>
|
<a class="footer" href="links.html">links</a>
| <a class="footer" href="privacy.html" target="blank">privacy
policy</a> |
<a class="footer" href="terms.html" target="blank">terms</a></div>
</div>
</body></html>
```

This is the end of "*Frequently Asked Questions (FAQ)*".