DEPARTMENT of CSIS

COBOL Example Programs

These pages contain a large number of example COBOL programs. The programs may be downloaded, or viewed in your browser. Test data for the example COBOL programs is also provided where appropriate.

The programs have been compiled and tested using Microfocus NetExpress but they should work on any COBOL-85 complient compiler with very few changes.
You may have to reformat the programs if your compiler does not have the equivalent of the $ SET SOURCEFORMAT"FREE". This compiler directive frees Microfocus COBOL programs from the normal COBOL formatting conventions.
You may also have to remove the ORGANIZATION IS LINE SEQUENTIAL phrase in the SELECT and ASSIGN clause of sequential files. In Microfocus COBOL, LINE SEQUENTIAL files terminate each record with a carriage return and line feed.

Beginners programs

Program Name	Description	Major constructs	Action
Shortest.cbl	This example program is almost the shortest COBOL program we can have. We could make it shorter still by leaving out the STOP RUN.	DISPLAY	Download View
Accept.cbl	The program accepts a simple student record from the user and displays the individual fields. Also shows how the ACCEPT may be used to get and DISPLAY the system time and date.	ACCEPT, DISPLAY, ACCEPT FROM DATE, ACCEPT FROM DAY, ACCEPT FROM TIME	Download View
Multiplier.cbl	Accepts two single digit numbers from the user, multiplies them together and displays the result.	ACCEPT, DISPLAY, MULTIPLY	Download View

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Selection and Interation

Program Name	Description	Major constructs	Action
IterIf.cbl	An example program that implements a primative calculator. The calculator only does additions and multiplications.	IF, PERFORM..TIMES, ADD, MULTIPLY	Download View
Conditions.cbl	An example program demonstrating the use of Condition Names (level 88's).	Condition Names (level 88's), EVALUATE, PERFORM..UNTIL	Download View
Perform1.cbl	An example program demonstrating how the first format of the PERFORM may be used to change the flow of control through a program.	PERFORM	Download View
Perform2.cbl	Demonstrates the second format of the PERFORM. The PERFORM..TIMES may be used to execute a block of code x number of times.	PERFORM..TIMES	Download View
Perform3.cbl	Demonstrates how the PERFORM..UNTIL (third format) may be used to process a stream of values where the length of the stream cannot be determined in advance (although in this case there is a set maximum number of values in the stream).	PERFORM..UNTI, ADD, COMPUTE, ON SIZE ERROR, INITIALIZE	Download View
Perform4.cbl	Demonstrates how the PERFORM..VARYING and the PERFORM..VARYING..AFTER (fourth format) may be used for counting iteration. Also introduces the WITH TEST BEFORE and WITH TEST AFTER phrases.	PERFORM..VARYING..AFTER, DISPLAY	Download View
MileageCount.cbl	Demonstrates how the PERFORM..VARYING and the PERFORM..VARYING..AFTER (fourth format) may be used to simulate a mileage counter.	PERFORM..VARYING..AFTER, DISPLAY	Download View

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Sequential Files

Program Name	Description	Major constructs	Action
SeqWrite.cbl	Example program demonstrating how to create a sequential file from data input by the user.	Sequential Files, WRITE, OPEN, CLOSE, File Description (FD), SELECT..ASSIGN	Download View
SeqReadno88.cbl	An example program that reads a sequential file and displays the records. This version does not use level 88's to signal when the end of the file has been reached. To test the program download thistestdata file.	Sequential Files, READ, OPEN, CLOSE, File Description (FD), SELECT..ASSIGN	Download View
SeqRead.cbl	An example program that reads a sequential file and displays the records. This is the correct version which uses the Condition Name (level 88) "EndOfFile"to signal when the end of the file has been reached. To test the program download this testdata file.	Sequential Files, Condition Names (level 88's) READ, OPEN, CLOSE, File Description (FD), SELECT..ASSIGN	Download View
SeqInsert.cbl	Demonstrates how to insert records into a sequential file from a file of transaction records. A new file is created which contains the inserted records. To test this program you will need to download Student Masterfile - Students.Dat and the Transaction file	Sequential Files, Condition Names (level 88's) READ, WRITE	Download View

Transins.dat.

SeqRpt.cbl	This program reads records from the student file, counts the total number of student records in the file and the number records for females and males. Prints the results in a very short report. To test the program download Students.Dat	Sequential Files, Condition Names (level 88's) READ, WRITE, Writing to a report file.	Download View

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Sorting and Merging

Program Name	Description	Major constructs	Action
InputSort.cbl	Uses the SORT and an INPUT PROCEDURE to accept records from the user and sort them on ascending StudentId.	SORT, Input Procedure	Download View
MaleSort.cbl	Sorts the student masterfile (sorted on ascending Student Id) and produces a new file, sorted on ascending student name, containing only the records of male students. To test the program download Students.Dat	SORT, Input Procedure	Download View
Merge.cbl	Uses the MERGE to insert records from a transaction file into a sequential master file. . To test this program you will need to download Student Masterfile - Students.Dat and the Transaction file Transins.dat.	MERGE	Download View
AromaSalesRpt.Cbl	Exam paper model answer. A program is required to produce a summary sales report from an unsorted sequential file containing the details of sales of essential and base oils to Aromamora customers. Read the program specification first. The required data files may be downloaded from there.	SORT with Input Procedure and Output Procedure, Print Files, Sequential Files, COMPUTE	Download View
CSISEmailDomain.Cbl	Exam paper model answer. A program is required which will produce a file, sorted on ascending email domain, from the unsorted GraduateInfo file. Read the program specification first. The required data files may be downloaded from there.	SORT with Input Procedure and Output Procedure, Sequential Files, Pre-Defined Tables, Run time filled tables, SEARCH	Download View
BestSellers.Cbl	Exam paper model answer. The Folio Society is a Book Club that sells fine books to customers all over the world. A program is required to print a list of the ten best selling books (by copies sold) in the Book Club. Read the program specification first. The required data files may be downloaded from there.	(Sequential Files, Print Files, SORT with Input Procedure and Output Procedure, Tables)	Download View
DueSubRpt.Cbl	Exam paper model answer. NetNews is a company which runs an NNTP server carrying the complete USENET news feed with over 15,000 news groups. Access to this server is available to internet users all over the world. Users of the system pay a subscription fee for access. A program is required to produce a report showing the subscriptions which are now due. The report will be based on the Due Subscriptions file.	(Sequential Files, Print Files, SORT with Input Procedure, Tables, SEARCH ALL)	Download View

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Direct Access Files

Program Name	Description	Major constructs	Action
Seq2Rel.cbl	Creates a direct access Relative file from a Sequential File. Note that Relative files are not standard ASCII files and so cannot be created with an editor as Sequential files can. To create the Relative file you will need to download the supplier file SEQSUPP.DAT	Relative files, Sequential Files, ACCESS MODE, RELATIVE KEY, FILE STATUS, READ..AT END, WRITE..INVALID KEY	Download View
ReadRel.cbl	Reads the Relative file - RELSUPP.DAT - created in the previous example program and displays the records. Allows the user to choose to read through and display all the records in the file sequentially, or to use a key to read just one record directly.	Relative files, ACCESS MODE, RELATIVE KEY, FILE STATUS, READ..NEXT RECORD, READ..INVALID KEY, Condition Names, IF	Download View
Seq2Index.cbl	Creates a direct access Indexed file from a Sequential file. Note that Microfocus Indexed files actually consist of two files - the data file and the index file (.idx). To create the Indexed file you will need to download the supplier file SEQVIDEO.DAT	Indexed files, Sequential Files, RECORD KEY, ALTERNATE KEY,READ..AT END, WRITE..INVALID KEY	Download View
DirectReadIdx.cbl	Does a direct read on the Indexed file created by the previous example program. Allows the user to choose which of the keys to use for the direct read.	Indexed files, READ..KEY IS.	Download View
SeqReadIdx.cbl	Reads the Indexed file sequentially on whichever key is chosen by the user. Displays all the records in the file.	Indexed files, READ..NEXT RECORD, START	Download View
StudFees.cbl	Exam paper model answer. A program which applies a transaction file of student payments to a Student Master File and which then produces a report showing those students whose fees are partially or wholly outstanding. Read the program specification first. The required data files may be downloaded from there.	Indexed files, Print files, READ..NEXT RECORD, START, WRITE, REWRITE, IF, PERFORM, ADD, SUBTRACT	Download View
Aroma96.cbl	Exam paper model answer. A program is required which will apply a file of sorted, validated transactions to the Oil-Stock-File and then produce a report based on the contents of both the Oil-Details-File and the Oil-Stock-File. The report writer must be used to produce the report which must be printed sequenced on ascending Oil-Name. Read the program specification first. The required data files may be downloaded from there.	Indexed files, Relative Files, Sequential Files, EVALUATE, COMPUTE, READ, WRITE, REWRITE, START, Report Writer, Report Section, INITIATE, GENERATE, TERMINATE,	Download View
BookshopRpt91.Cbl	Exam paper model answer. A program is required to produce a Purchase Requirements Report from the Publisher, Book and Purchase Requirements files. The report should be sequenced on ascending Publisher Name and should only detail the purchase requirements for the semester under scrutiny. Read the program specification first. The required data files may be downloaded from there.	Indexed files, Report Writer, Report Section, INITIATE, GENERATE, TERMINATE, READ, WRITE, REWRITE, START	Download View
LibRoyaltyRpt.Cbl	Exam paper model answer. Each time a book is borrowed, the Pascal Memorial Library pays the author a small sum	Indexed Files, Print Files, READ..NEXT RECORD,	Download View

	of money as royalty.• Royalties are paid to authors through their agents. A report is required which processes the Authors file and the Books File to produce a report which shows the amount to be sent to each agent, shows the breakdown of the agent payment into author payments, and shows the breakdown of each author payment into royalty payments per book. Read the program specification first. The required data files may be downloaded from there.	READ..KEY IS, START, REWRITE, WRITE, MULTIPLY, SET	
TopSuppliersRpt.Cbl	Exam paper model answer. The manager of Metropolis Videos has asked you to write a program to produce a report showing the top three Video Suppliers (by total store video earnings) and for each of the top three the most popular video title (by average earnings) must be shown. Read the program specification first. The required data files may be downloaded from there.	Indexed Files, Relative Files, Print Files, READ, START, Tables, DIVIDE	Download View

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CALLing sub-programs

Program Name	Description	Major constructs	Action
DriverProg.cbl	This program demonstrates the CALL verb by calling three external sub-programs. The "MultiplyNums" sub-program demonstrates flow of control - from caller to called and back again - and the use of parameters. The "Fickle" sub-program demonstrates State Memory. The "Steadfast" sub-program shows how a sub-program can use the IS INITIAL phrase to avoid State Memory.	Calling external sub-programs. CALL..BY REFERENCE, CALL..BY CONTENT, COMP, CANCEL	Download View
MultiplyNums.cbl	The "MultiplyNums" sub-program, called from the driver program above, demonstrates the flow of control from the driver program to the called sub-program and back again. It uses numeric and string parameters and demonstrates the BY REFERENCE (the default) and BY CONTENT parameter passing mechanisms.	Calling external sub-programs, LINKAGE SECTION, EXIT PROGRAM	Download View
Fickle.cbl	Fickle is a sub-program called from DriverProg.cbl above. Fickle is a program that demonstrates State Memory. Each time the program is called it remembers its state from the previous call.	Calling external sub-programs, LINKAGE SECTION, EXIT PROGRAM	Download View
Steadfast.cbl	Steadfast is a sub-program called from DriverProg.cbl above. Steadfast is identical to Fickle except that it uses the IS INITIAL phrase to avoid State Memory.	Calling external sub-programs, IS INITIAL, LINKAGE SECTION, EXIT PROGRAM	Download View
DateDriver.cbl	A driver program for the date validation sub-program below. Accepts a date from the user, passes it to the date validation sub-program and interprets and displays the result.	External sub-programs, CALL, ACCEPT, DISPLAY, EVALUATE	Download View
ValiDate.cbl	A date validation sub-program. Takes a date parameter in the form DDMMYYYY and returns a code indicating if the date was valid or not. If not valid, the code indicates why the date was not valid (e.g. day to great for month).	External sub-programs, IS INITIAL, LINKAGE SECTION, EVALUATE, IF..ELSE, DIVIDE..REMAINDER, SET ConditionName, EXIT	Download View

		PROGRAM	
DayDiffDriver.cbl	A driver program that accepts two dates from the user and displays the difference in days between them. This program uses the ValiDate.cbl sub-program above and also contains a number of contained sub-programs.	CALL, LINKAGE SECTION, Contained Sub-Programs, External Sub-Programs, Intrinsic Functions, EXIT PROGRAM, END PROGRAM, FUNCTION INTEGER-OF-DATE	Download View
ACME99.cbl	Exam paper model answer. A program is required which will process the Stock and Manufacturer files to create an Orders file containing ordering information for all the parts that need to be re-ordered (i.e. where the QtyInStock is less than the ReorderLevel). For EU countries only, the COSTOFITEMS and POSTAGE fields of each Orders file record must be calculated. The Postage rate is obtained by calling an existing program. Read the program specification first. The required data files may be downloaded from there.	Indexed files, Relative Files, SubPrograms, CALL..USING, READ, WRITE, REWRITE, Condition Names (level 88s), EVALUATE, UNSTRING, MULTIPLY..ON SIZE ERROR	Download View
SFbyMail.cbl	Exam paper model answer. A program is required to apply the Orders file (containing customer orders) to the indexed Book Stock file and to produce the Processed Orders file. Read the program specification first. The required data files may be downloaded from there.	CALL, subprograms, Sequential files, Indexed files, READ, WRITE, REWRITE, COMPUTE, UNSTRING	Download View

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String handling

Program Name	Description	Major constructs	Action
RefMod.cbl	Solves a number of string handling tasks such as : - Extracting a substring from a string given the start position and length of the substring. Extracting the first x number of chars from a string. Extracting the last x number of chars from a string. Removing trailing blanks from a string. Removing leading blanks from a string. Finding the location of the first occurrence of any of a substring's chars in a string	Reference Modification, INSPECT, Intrinsic Functions, FUNCTION REVERSE	Download View
UnstringFileEg.cbl	An example showing the unpacking of comma separated records and the size validation of the unpacked fields. To test this program use the data file VarLen.dat.	UNSTRING, Reference Modification, IF, Condition Names, Sequential files	Download View
FileConv.Cbl	Exam paper model answer. A program is required to convert the unsorted Client-Names file of free-format, variable length, records into a sorted file of fixed length records. The sorted file must be sorted into ascending Client-Name within ascending County-Name. In addition to converting and sorting the file, the program must ensure that the county name is valid and must convert it to a county number. Read the program specification first. The required data	Sequential files, SORT with Input Procedure, Pre-Defined Table of values, STRING, UNSTRING, INSPECT, SEARCH ALL	Download View

files may be downloaded from there.

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The COBOL Report Writer

Program Name	Description	Major constructs	Action
RepWriteA.cbl	A simplified version of RepWriteFull.cbl using only one control break. All four of these Report Writer programs use the GBsales.dat data file.	Report Writer, Report Section, INITIATE, GENERATE, TERMINATE	Download View
RepWriteB.cbl	A simplified version of RepWriteFull.cbl containing all the control breaks but not using Declaratives. All four of these Report Writer programs use the GBsales.dat data file.	Report Writer, Report Section, INITIATE, GENERATE, TERMINATE	Download View
RepWriteFull.cbl	The full version of the report program containing all the control breaks and using Declaratives to calculate the salesperson salary and commission. All four of these Report Writer programs use the GBsales.dat data file.	Report Writer, Report Section, INITIATE, GENERATE, TERMINATE, Declaratives, USE BEFORE REPORTING	Download View
RepWriteSumm.cbl	The summary version of the full report program containing all the control breaks and using Declaratives to calculate the salesperson salary and commission. All four of these Report Writer programs use the GBsales.dat data file.	Report Writer, Report Section, INITIATE, GENERATE, TERMINATE, Declaratives, USE BEFORE REPORTING	Download View

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COBOL Tables

Program Name	Description	Major constructs	Action
MonthTable.cbl	This program counts the number of students born in each month and displays the result. The program uses a pre-filled table of month names. This program is the solution to one of the programming exercises. Read the program specification first.	Pre-Filled Tables, Sequential files, PERFORM..VARYING, PERFORM..UNTIL	Download View
FlyByNight.cbl	Exam paper model answer. A program is required which will read the Booking Master file to produce a Summary file sequenced upon ascending Destination-Name. Read the program specification first. The required data files may be downloaded from there.	Pre-Filled Tables, Sequential Files, SORT with Input Procedure, SEARCH, INSPECT	Download View
USSRship.cbl	Exam paper model answer. A program is required to produce a report detailing the major vessels (Vessels of tonnage 3,500 or greater and all submarines) in each of oceans and major seas of the world. Read the program specification first. The required data files may be downloaded from there.	Sequential files, SORT with Input Procedure, Print Files, Pre-defined tables, Condition Names	Download View

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