

```

PPPPPPPPPP RRRRRRRRRR IIIIIIIIII MM MM CCCCCCCCCC 000000000000 BBBB BBBB 11
PPPPPPPPPP RRRRRRRRRR IIIIIIIIII MMM MMM CCCCCCCCCC 000000000000 BBBB BBBB 111
PP PP PP RR RR II MM MM MM MM CC CC 00 00 BB BB 1111
PP PP PP RR RR II MM MM MM MM CC 00 00 BB BB 11
PPPPPPPPPP RRRRRRRRRR II MM MM MM CC 00 00 BBBB BBBB 11
PPPPPPPPPP RRRRRRRRRR II MM MM CC 00 00 BBBB BBBB 11
PP RR RR II MM MM CC 00 00 BB BB 11
PP RR RR II MM MM CC 00 00 BB BB 11
PP RR RR II MM MM CC CC 00 00 BB BB 11
PP RR RR IIIIIIIIII MM MM CCCCCCCCCC 000000000000 BBBB BBBB 11111111
PP RR RR IIIIIIIIII MM MM CCCCCCCCCC 000000000000 BBBB BBBB 11111111

```

```

JJJJJJJJJJ 3333333333 EEEEEEEEEEE
JJJJJJJJJJ 3333333333 EEEEEEEEEEE
JJ 33 33 EE
JJ 33 EE
JJ 33 EE
JJ 3333 EEEEEEE
JJ 3333 EEEEEEE
JJ 33 EE
JJ JJ 33 EE
JJ JJ 33 EE
JJJJJJJJ 3333333333 EEEEEEEEEEE
JJJJJJ 3333333333 EEEEEEEEEEE

```

****E	START	JOB	3	PRIMCOB1	Eratosthenes Sieve	ROOM	4.54.01	PM	16	JUN	25	PRINTER4	SYS	PI5B	JOB	3	START	E****
****E	START	JOB	3	PRIMCOB1	Eratosthenes Sieve	ROOM	4.54.01	PM	16	JUN	25	PRINTER4	SYS	PI5B	JOB	3	START	E****
****E	START	JOB	3	PRIMCOB1	Eratosthenes Sieve	ROOM	4.54.01	PM	16	JUN	25	PRINTER4	SYS	PI5B	JOB	3	START	E****
****E	START	JOB	3	PRIMCOB1	Eratosthenes Sieve	ROOM	4.54.01	PM	16	JUN	25	PRINTER4	SYS	PI5B	JOB	3	START	E****

J E S 2 J O B L O G

```
16.53.27 JOB    3  $HASP373 PRIMCOB1 STARTED - INIT  1 - CLASS A - SYS PI5B
16.53.27 JOB    3  IEF403I PRIMCOB1 - STARTED - TIME=16.53.27
16.53.27 JOB    3  IEFACTRT - Stepname  Procstep  Program  Retcode
16.53.27 JOB    3  PRIMCOB1  PRIMES    COB          IKFCBL00  RC= 0000
16.53.27 JOB    3  PRIMCOB1  PRIMES    GO           LOADER   RC= 0000
16.53.27 JOB    3  IEF404I PRIMCOB1 - ENDED - TIME=16.53.27
16.53.27 JOB    3  $HASP395 PRIMCOB1 ENDED
```

----- JES2 JOB STATISTICS -----

16 JUN 25 JOB EXECUTION DATE

168 CARDS READ

299 SYSOUT PRINT RECORDS

0 SYSOUT PUNCH RECORDS

0.00 MINUTES EXECUTION TIME

```

1  //PRIMCOB1 JOB (COBOL),                                JOB      3
   //          'Eratosthenes Sieve',
   //          CLASS=A,
   //          MSGCLASS=E,
   //          REGION=8M,TIME=1440,
   //          MSGLEVEL=(1,1),
   //          USER=SCOTT,PASSWORD=          GENERATED BY IKJEFF10
*****
***
*** Name: SYS2.JCLLIB(PRIMCOB1)
***
*** Desc: Sieve of Eratosthenes programmed in COBOL.
***       All prime numbers up to the value entered via
***       //GO.SYSIN DD are computed. Due to a COBOL
***       implementation limitation a maximum limit
***       of 32767 can be entered.
***
*****
2  //PRIMES      EXEC COBUCG,
   //          PARM.COB='FLAGW,LOAD,SUPMAP,SIZE=2048K,BUF=1024K'
3  XXCOBUCG PROC SOUT='*'                                00000100
4  XXCOB EXEC PGM=IKFCBL00,                                00000200
   XX          PARM='LOAD,SIZE=2048K,BUF=1024K'            00000300
5  XXSYSPRINT DD SYSOUT=&SOUT                              00000400
6  XXSYSUT1 DD UNIT=SYSDA,SPACE=(460,(700,100))           00000500
7  XXSYSUT2 DD UNIT=SYSDA,SPACE=(460,(700,100))           00000600
8  XXSYSUT3 DD UNIT=SYSDA,SPACE=(460,(700,100))           00000700
9  XXSYSUT4 DD UNIT=SYSDA,SPACE=(460,(700,100))           00000800
10 XXSYSLIN DD DSN=&LOADSET,DISP=(MOD,PASS),                00000900
   XX          UNIT=SYSDA,SPACE=(80,(500,100))            00001000
11 //COB.SYSPUNCH DD DUMMY
12 //COB.SYSIN   DD *
13 //COB.SYSLIB  DD DSN=SYS1.COBLIB,DISP=SHR
14 XXGO EXEC PGM=LOADER,PARM='MAP,LET',COND=(5,LT,COB)    00001100
15 XXSYSLIN DD DSN=*.COB.SYSLIN,DISP=(OLD,DELETE)         00001200
16 XXSYSLOUT DD SYSOUT=&SOUT                                00001300
17 XXSYSLIB DD DSN=SYS1.COBLIB,DISP=SHR                   00001400
18 //GO.SYSOUT  DD SYSOUT=*,DCB=(RECFM=FBA,LRECL=161,BLKSIZE=16100)
19 //GO.SYSIN   DD *

```

STMT NO. MESSAGE

```
5 IEF653I SUBSTITUTION JCL - SYSOUT=*
16 IEF653I SUBSTITUTION JCL - SYSOUT=*
IEF236I ALLOC. FOR PRIMCOB1 COB PRIMES
IEF237I JES2 ALLOCATED TO SYSPRINT
IEF237I 293 ALLOCATED TO SYSUT1
IEF237I 290 ALLOCATED TO SYSUT2
IEF237I 292 ALLOCATED TO SYSUT3
IEF237I 291 ALLOCATED TO SYSUT4
IEF237I 290 ALLOCATED TO SYSLIN
IEF237I DMY ALLOCATED TO SYSPUNCH
IEF237I JES2 ALLOCATED TO SYSIN
IEF237I 390 ALLOCATED TO SYSLIB
IEF142I PRIMCOB1 COB PRIMES - STEP WAS EXECUTED - COND CODE 0000
IEF285I JES2.JOB00003.S00103 SYSOUT
IEF285I SYS25167.T165327.RA000.PRIMCOB1.R0000001 DELETED *-----6
IEF285I VOL SER NOS= WORK04.
IEF285I SYS25167.T165327.RA000.PRIMCOB1.R0000002 DELETED *-----6
IEF285I VOL SER NOS= WORK01.
IEF285I SYS25167.T165327.RA000.PRIMCOB1.R0000003 DELETED *-----9
IEF285I VOL SER NOS= WORK03.
IEF285I SYS25167.T165327.RA000.PRIMCOB1.R0000004 DELETED *-----3
IEF285I VOL SER NOS= WORK02.
IEF285I SYS25167.T165327.RA000.PRIMCOB1.LOADSET PASSED *-----71
IEF285I VOL SER NOS= WORK01.
IEF285I JES2.JOB00003.SI0101 SYSIN
IEF285I SYS1.COBLIB KEPT *-----0
IEF285I VOL SER NOS= TK5RES.
IEF373I STEP /COB / START 25167.1653
IEF374I STEP /COB / STOP 25167.1653 CPU 0MIN 00.07SEC SRB 0MIN 00.02SEC VIRT 2076K SYS 220K
*****
* 1. Jobstep of job: PRIMCOB1 Stepname: COB Program name: IKFCBL00 Executed on 16.06.25 from 16.53.27 to 16.53.27 *
* elapsed time 00:00:00,21 CPU-Identifier: PI5B Page-in: 0 *
* CPU time 00:00:00,09 Virtual Storage used: 2076K Page-out: 0 *
* corr. CPU: 00:00:00,09 CPU time has been corrected by 1 / 1,0 multiplier *
*
* I/O Operation *
* Number of records read via DD * or DD DATA: 140 *
* DMY.....0 293.....6 290.....6 292.....9 291.....3 290.....71 DMY.....0 DMY.....0 390.....0 *
*
* Charge for step (w/o SYSOUT): 0,15 *
*****
IEF236I ALLOC. FOR PRIMCOB1 GO PRIMES
IEF237I 290 ALLOCATED TO SYSLIN
IEF237I JES2 ALLOCATED TO SYSLOUT
IEF237I 390 ALLOCATED TO SYSLIB
IEF237I JES2 ALLOCATED TO SYSOUT
IEF237I JES2 ALLOCATED TO SYSIN
IEF142I PRIMCOB1 GO PRIMES - STEP WAS EXECUTED - COND CODE 0000
IEF285I SYS25167.T165327.RA000.PRIMCOB1.LOADSET DELETED *-----72
IEF285I VOL SER NOS= WORK01.
IEF285I JES2.JOB00003.S00104 SYSOUT
IEF285I SYS1.COBLIB KEPT *-----29
IEF285I VOL SER NOS= TK5RES.
IEF285I JES2.JOB00003.S00105 SYSOUT
IEF285I JES2.JOB00003.SI0102 SYSIN
IEF373I STEP /GO / START 25167.1653
IEF374I STEP /GO / STOP 25167.1653 CPU 0MIN 00.02SEC SRB 0MIN 00.01SEC VIRT 332K SYS 208K
*****
* 2. Jobstep of job: PRIMCOB1 Stepname: GO Program name: LOADER Executed on 16.06.25 from 16.53.27 to 16.53.27 *
```

```
*      elapsed time 00:00:00,05      CPU-Identifier: PI5B      Page-in:      0      *
*      CPU time 00:00:00,03      Virtual Storage used: 332K      Page-out:      0      *
*      corr. CPU: 00:00:00,03      CPU time has been corrected by 1 / 1,0 multiplier      *
*
*      I/O Operation      *
*      Number of records read via DD * or DD DATA: 1      *
*      290.....72 DMY.....0 390.....29 DMY.....0 DMY.....0      *
*
*      Charge for step (w/o SYSOUT): 0,05      *
*****
IEF375I JOB /PRIMCOB1/ START 25167.1653
IEF376I JOB /PRIMCOB1/ STOP 25167.1653 CPU 0MIN 00.09SEC SRB 0MIN 00.03SEC
```

1

```
00001      10 * //////////////////////////////////////////// PRIME
00002      20 * // Name: Peter M. Maurer PRIME
00003      30 * // Program: Sieve of Eratosthenes PRIME
00004      40 * // Due: Never PRIME
00005      50 * // Language: COBOL PRIME
00006      60 * // PRIME
00007      70 * // Changes: PRIME
00008      80 * // - Juergen Winkelmann, 2014/10/25, o adaption to IBM OS COBOL PRIME
00009      90 * // o read limit from SYSIN PRIME
00010     100 * // o n**2 (sqrt) shortcut PRIME
00011     110 * // o skip even numbers PRIME
00012     120 * // o compact output format PRIME
00013     130 * // o 32767 prime flags PRIME
00014     140 * //////////////////////////////////////////// PRIME
00015     150 *** PRIME
00016     160 *** PRIME
00017     170 *** PRIME
00018     180 IDENTIFICATION DIVISION. PRIME
00019     190 PROGRAM-ID. 'PRIMES'. PRIME
00020     200 *** PRIME
00021     210 *** PRIME
00022     220 *** PRIME
00023     230 ENVIRONMENT DIVISION. PRIME
00024     240 ** PRIME
00025     250 ** PRIME
00026     260 CONFIGURATION SECTION. PRIME
00027     270 SOURCE-COMPUTER. IBM-360. PRIME
00028     280 OBJECT-COMPUTER. IBM-360. PRIME
00029     290 ** PRIME
00030     300 ** PRIME
00031     310 INPUT-OUTPUT SECTION. PRIME
00032     320 FILE-CONTROL. PRIME
00033     330 SELECT PRIMES-SYSIN PRIME
00034     340 ASSIGN TO UT-S-SYSIN. PRIME
00035     350 *** PRIME
00036     360 *** PRIME
00037     370 *** PRIME
00038     380 DATA DIVISION. PRIME
00039     390 ** PRIME
00040     400 ** PRIME
00041     410 FILE SECTION. PRIME
00042     420 FD PRIMES-SYSIN PRIME
00043     430 RECORDING MODE IS F PRIME
00044     440 RECORD CONTAINS 80 CHARACTERS PRIME
00045     450 BLOCK CONTAINS 1 RECORDS PRIME
00046     460 LABEL RECORDS ARE OMITTED PRIME
00047     470 DATA RECORD IS PRIMES-SYSIN-RECORD. PRIME
00048     480 01 PRIMES-SYSIN-RECORD. PRIME
00049     490 02 PRIMES-SYSIN-NUMBER PIC 99999999 OCCURS 10. PRIME
00050     500 ** PRIME
00051     510 ** PRIME
00052     520 WORKING-STORAGE SECTION. PRIME
00053     530 77 I PIC 99999999 COMP VALUE 1. PRIME
00054     540 77 J PIC 99999999 COMP. PRIME
```

00055	550	77 K PIC 99999999 COMP VALUE 1.	PRIME
00056	560	77 N PIC 99999999 COMP.	PRIME
00057	570	77 N-2 PIC 99999999 COMP.	PRIME
00058	580	77 SQRTN PIC 99999999 COMP.	PRIME
00059	590	77 PRODUCT PIC 99999999 COMP.	PRIME
00060	600	01 BLANK-LINE PIC X(160).	PRIME
00061	610	01 OUT-INTEGER.	PRIME
00062	620	02 SHOWIT PIC ZZZZZZZZ OCCURS 20.	PRIME
00063	630	01 OUT REDEFINES OUT-INTEGER.	PRIME
00064	640	02 OUT-LINE PIC X(160).	PRIME
00065	650	01 PRIME-FLAGS.	PRIME
00066	660	02 ISPRIME PIC 9 OCCURS 32767.	PRIME
00067	670	***	PRIME
00068	680	***	PRIME
00069	690	***	PRIME
00070	700	PROCEDURE DIVISION.	PRIME
00071	710	**	PRIME
00072	720	**	PRIME
00073	730	MAIN-PART.	PRIME
00074	740	OPEN INPUT PRIMES-SYSIN.	PRIME
00075	750	READ PRIMES-SYSIN AT END DISPLAY '** EOF on SYSIN **'.	PRIME
00076	760	MOVE PRIMES-SYSIN-NUMBER (1) TO N.	PRIME
00077	770	CLOSE PRIMES-SYSIN.	PRIME
00078	780	SUBTRACT 2 FROM N GIVING N-2.	PRIME
00079	790	*	PRIME
00080	800	PERFORM NEXT-SQUARE UNTIL SQRTN GREATER N.	PRIME
00081	810	MOVE I TO SQRTN.	PRIME
00082	820	*	PRIME
00083	830	MOVE 3 TO I.	PRIME
00084	840	PERFORM INIT-1 UNTIL I GREATER N.	PRIME
00085	850	*	PRIME
00086	860	MOVE 3 TO I.	PRIME
00087	870	PERFORM CHECK-NUMBER UNTIL I GREATER SQRTN OR EQUAL SQRTN.	PRIME
00088	880	*	PRIME
00089	890	MOVE 3 TO I.	PRIME
00090	900	MOVE 2 TO J.	PRIME
00091	910	MOVE J TO SHOWIT (K).	PRIME
00092	920	PERFORM PRINT UNTIL I GREATER N.	PRIME
00093	930	*	PRIME
00094	940	MOVE K TO SHOWIT (1).	PRIME
00095	950	MOVE N TO SHOWIT (2).	PRIME
00096	960	DISPLAY ' '.	PRIME
00097	970	DISPLAY SHOWIT (1), ' primes up to ', SHOWIT (2), ' found.'.	PRIME
00098	980	STOP RUN.	PRIME
00099	990	**	PRIME
00100	1000	**	PRIME
00101	1010	INIT-1.	PRIME
00102	1020	MOVE 1 TO ISPRIME (I).	PRIME
00103	1030	ADD 2 TO I.	PRIME
00104	1040	**	PRIME
00105	1050	**	PRIME
00106	1060	CHECK-NUMBER.	PRIME
00107	1070	PERFORM ADVANCE UNTIL I GREATER THAN SQRTN OR EQUAL TO SQRT	PRIME
00108	1080	- N OR ISPRIME (I) EQUAL TO 1.	PRIME
00109	1090	IF ISPRIME (I) EQUAL TO 1	PRIME
00110	1100	ADD I I GIVING J	PRIME
00111	1110	MULTIPLY I BY I GIVING PRODUCT	PRIME

00112	1120	PERFORM CROSS-OUT UNTIL PRODUCT GREATER THAN N.	PRIME
00113	1130	ADD 2 TO I.	PRIME
00114	1140	**	PRIME
00115	1150	**	PRIME
00116	1160	ADVANCE.	PRIME
00117	1170	ADD 2 TO I.	PRIME
00118	1180	**	PRIME
00119	1190	**	PRIME
00120	1200	CROSS-OUT.	PRIME
00121	1210	MOVE 0 TO ISPRIME (PRODUCT).	PRIME
00122	1220	ADD J TO PRODUCT.	PRIME
00123	1230	**	PRIME
00124	1240	**	PRIME
00125	1250	NEXT-SQUARE.	PRIME
00126	1260	ADD 1 TO I.	PRIME
00127	1270	MULTIPLY I BY I GIVING SQRTN.	PRIME
00128	1280	**	PRIME
00129	1290	**	PRIME
00130	1300	PRINT.	PRIME
00131	1310	IF ISPRIME (I) EQUAL TO 1	PRIME
00132	1320	MOVE I TO SHOWIT (J)	PRIME
00133	1330	ADD 1 TO K	PRIME
00134	1340	ADD 1 TO J	PRIME
00135	1350	IF J GREATER 20	PRIME
00136	1360	DISPLAY OUT-LINE	PRIME
00137	1370	MOVE BLANK-LINE TO OUT-LINE	PRIME
00138	1380	MOVE 1 TO J.	PRIME
00139	1390	IF I GREATER N-2 AND J NOT EQUAL 1 DISPLAY OUT-LINE.	PRIME
00140	1400	ADD 2 TO I.	PRIME

```
*STATISTICS*      SOURCE RECORDS =   140      DATA DIVISION STATEMENTS =    17      PROCEDURE DIVISION STATEMENTS =    45
*OPTIONS IN EFFECT*  SIZE = 2097152  BUF = 1048576  LINECNT = 57  SPACE1, FLAGW,   SEQ,   SOURCE
*OPTIONS IN EFFECT*  NODMAP, NOPMAP, NOCLIST,   SUPMAP, NOXREF,   LOAD, NODECK, APOST, NOTRUNC, NOLIB, NOVERB
*OPTIONS IN EFFECT*      ZWB
```

VS LOADER

OPTIONS USED - PRINT,MAP,LET,CALL,RES,NOTERM,SIZE=307200,NAME=**GO

NAME	TYPE	ADDR	NAME	TYPE	ADDR	NAME	TYPE	ADDR	NAME	TYPE	ADDR	NAME	TYPE	ADDR
PRIMES	SD	AC010	ILBOSTP0*	SD	B4D40	ILBOSTP1*	LR	B4D56	ILB0DSP0*	SD	B4D78	ILB0BID0*	SD	B5478
ILBOBID2*	LR	B5484	ILBOBID1*	LR	B5498	ILB0IDB0*	SD	B54E0	ILB0IDB1*	LR	B54FC			

TOTAL LENGTH 9538
ENTRY ADDRESS AC010

2	3	5	7	11	13	17	19	23	29	31	37	41	43	47	53
73	79	83	89	97	101	103	107	109	113	127	131	137	139	149	151
179	181	191	193	197	199	211	223	227	229	233	239	241	251	257	263
283	293	307	311	313	317	331	337	347	349	353	359	367	373	379	383
419	421	431	433	439	443	449	457	461	463	467	479	487	491	499	503
547	557	563	569	571	577	587	593	599	601	607	613	617	619	631	641
661	673	677	683	691	701	709	719	727	733	739	743	751	757	761	769
811	821	823	827	829	839	853	857	859	863	877	881	883	887	907	911
947	953	967	971	977	983	991	997	1009	1013	1019	1021	1031	1033	1039	1049
1087	1091	1093	1097	1103	1109	1117	1123	1129	1151	1153	1163	1171	1181	1187	1193
1229	1231	1237	1249	1259	1277	1279	1283	1289	1291	1297	1301	1303	1307	1319	1321
1381	1399	1409	1423	1427	1429	1433	1439	1447	1451	1453	1459	1471	1481	1483	1487
1523	1531	1543	1549	1553	1559	1567	1571	1579	1583	1597	1601	1607	1609	1613	1619
1663	1667	1669	1693	1697	1699	1709	1721	1723	1733	1741	1747	1753	1759	1777	1783
1823	1831	1847	1861	1867	1871	1873	1877	1879	1889	1901	1907	1913	1931	1933	1949
1993	1997	1999													

303 primes up to 2000 found.

PPPPPPPPPP	RRRRRRRRRR	IIIIIIIIII	MM	MM	CCCCCCCC	0000000000	BBBBBBBBBB	11				
PPPPPPPPPP	RRRRRRRRRR	IIIIIIIIII	MMM	MMM	CCCCCCCC	0000000000	BBBBBBBBBB	111				
PP	PP	RR	RR	II	MM	MM	CC	00	00	BB	BB	1111
PP	PP	RR	RR	II	MM	MM	CC	00	00	BB	BB	11
PP	PP	RR	RR	II	MM	MM	CC	00	00	BB	BB	11
PPPPPPPPPP	RRRRRRRRRR	II	MM	MM	CC	00	00	BB	BB	11		
PPPPPPPPPP	RRRRRRRRRR	II	MM	MM	CC	00	00	BB	BB	11		
PP	RR	RR	II	MM	MM	CC	00	00	BB	BB	11	
PP	RR	RR	II	MM	MM	CC	00	00	BB	BB	11	
PP	RR	RR	II	MM	MM	CC	00	00	BB	BB	11	
PP	RR	RR	IIIIIIIIII	MM	MM	CCCCCCCC	0000000000	BBBBBBBBBB	11111111			
PP	RR	RR	IIIIIIIIII	MM	MM	CCCCCCCC	0000000000	BBBBBBBBBB	11111111			

JJJJJJJJJ	333333333	EEEEEEEEEEEE	
JJJJJJJJJ	3333333333	EEEEEEEEEEEE	
JJ	33	33	EE
JJ		33	EE
JJ		33	EE
JJ	3333		EEEEEEEE
JJ	3333		EEEEEEEE
JJ		33	EE
JJ		33	EE
JJ	33	33	EE
JJJJJJJ	3333333333	EEEEEEEEEEEE	
JJJJJ	333333333	EEEEEEEEEEEE	

****E	END	JOB	3	PRIMCOB1	Eratosthenes Sieve	ROOM	4.54.01	PM	16	JUN	25	PRINTER4	SYS	PI5B	JOB	3	END	E****
****E	END	JOB	3	PRIMCOB1	Eratosthenes Sieve	ROOM	4.54.01	PM	16	JUN	25	PRINTER4	SYS	PI5B	JOB	3	END	E****
****E	END	JOB	3	PRIMCOB1	Eratosthenes Sieve	ROOM	4.54.01	PM	16	JUN	25	PRINTER4	SYS	PI5B	JOB	3	END	E****
****E	END	JOB	3	PRIMCOB1	Eratosthenes Sieve	ROOM	4.54.01	PM	16	JUN	25	PRINTER4	SYS	PI5B	JOB	3	END	E****