

COBOL code

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IDENTIFICATION DIVISION.
PROGRAM-ID. MORTGAGE.

DATA DIVISION.
WORKING-STORAGE SECTION.

01 TOTAL-LOAN          PIC 9(11)V99 VALUE ZERO.
01 CURRENT-PRINCIPAL  PIC 9(9)V99 VALUE ZERO.
01 ACCELERATED-PAYMENT PIC 9(9)V99 VALUE ZERO.
01 INTEREST-RATE      PIC 9V9999 VALUE ZERO.
01 YEARS              PIC 999 VALUE ZERO.
01 MONTHS             PIC 9999 VALUE ZERO.
01 MONTHLY-RATE       PIC 9V99999999 VALUE ZERO.
01 MONTHLY-PAYMENT    PIC 9(9)V99 VALUE ZERO.
01 INTEREST-PAYMENT   PIC 9(9)V99 VALUE ZERO.
01 TOTAL-INTEREST     PIC 9(11)V99 VALUE ZERO.
01 LOOP-CTR           PIC 9(5) VALUE 0.

* Date fields
01 CURR-YEAR          PIC 9(4) VALUE 2025.
01 CURR-MONTH        PIC 99 VALUE 12.
01 WS-DATE           PIC X(10).

* Edited output fields
01 PRINCIPAL-D        PIC $$$,$$$,$$9.99.
01 ADDTL-PMT-D        PIC $$$,$$9.99.
01 INTEREST-D         PIC $$$,$$9.99.
01 PAYMENT-D          PIC $$$,$$9.99.
01 BALANCE-D          PIC $$$,$$$,$$9.99.
01 TOTAL-INT-D        PIC $$$,$$$,$$9.99.

* Line buffer
01 OUT-LINE           PIC X(120).

PROCEDURE DIVISION.

    MOVE 100000 TO TOTAL-LOAN.
    MOVE 500     TO ACCELERATED-PAYMENT.
    MOVE 0.075  TO INTEREST-RATE.
    MOVE 30     TO YEARS.
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COMPUTE MONTHS          = YEARS * 12.
COMPUTE MONTHLY-RATE = INTEREST-RATE / 12.
COMPUTE MONTHLY-PAYMENT =
-   TOTAL-LOAN * FUNCTION ANNUITY(MONTHLY-RATE, MONTHS).

DISPLAY " ".
STRING
"DATE          PRINCIPAL      ADDTL PMT      INTEREST      "
"PAYMENT       BALANCE        TOTAL INT"
DELIMITED BY SIZE
INTO OUT-LINE
END-STRING

DISPLAY OUT-LINE.

MAIN-LOOP.
PERFORM UNTIL TOTAL-LOAN = 0

    ADD 1 TO CURR-MONTH
    IF CURR-MONTH > 12
        SUBTRACT 12 FROM CURR-MONTH
        ADD 1 TO CURR-YEAR
    END-IF

* Format date
STRING
    CURR-MONTH "/08/" CURR-YEAR
DELIMITED BY SIZE
INTO WS-DATE
END-STRING

* Amortization math
COMPUTE INTEREST-PAYMENT ROUNDED =
-   MONTHLY-RATE * TOTAL-LOAN

COMPUTE CURRENT-PRINCIPAL ROUNDED =
-   (MONTHLY-PAYMENT - INTEREST-PAYMENT)
-   + ACCELERATED-PAYMENT

IF CURRENT-PRINCIPAL > TOTAL-LOAN
    MOVE TOTAL-LOAN TO CURRENT-PRINCIPAL
END-IF

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COMPUTE TOTAL-LOAN = TOTAL-LOAN - CURRENT-PRINCIPAL

ADD INTEREST-PAYMENT TO TOTAL-INTEREST

* Move numbers into edited fields
MOVE CURRENT-PRINCIPAL TO PRINCIPAL-D
MOVE ACCELERATED-PAYMENT TO ADDTL-PMT-D
MOVE INTEREST-PAYMENT TO INTEREST-D
MOVE MONTHLY-PAYMENT TO PAYMENT-D
MOVE TOTAL-LOAN TO BALANCE-D
MOVE TOTAL-INTEREST TO TOTAL-INT-D

* Build aligned output line
STRING
    WS-DATE          DELIMITED BY SIZE
    SPACE SPACE
    PRINCIPAL-D      DELIMITED BY SIZE
    SPACE SPACE
    ADDTL-PMT-D      DELIMITED BY SIZE
    SPACE SPACE
    INTEREST-D        DELIMITED BY SIZE
    SPACE SPACE
    PAYMENT-D         DELIMITED BY SIZE
    SPACE SPACE
    BALANCE-D         DELIMITED BY SIZE
    SPACE SPACE
    TOTAL-INT-D       DELIMITED BY SIZE
    INTO OUT-LINE
END-STRING

DISPLAY OUT-LINE

END-PERFORM.

MOVE TOTAL-INTEREST TO TOTAL-INT-D.
DISPLAY " ".
DISPLAY "TOTAL INTEREST PAID: " TOTAL-INT-D.

GOBACK.

```

JCL Code

```

//MORTGAGE JOB 1,NOTIFY=&SYSUID
//COBRUN EXEC IGYWCL
//COBOL.SYSIN DD DSN=S990071.COBOL.CBL(MORTGAGE),DISP=SHR
//LKED.SYSLMOD DD DSN=S990071.COBOL.LOAD(MORTGAGE),DISP=SHR
//GO EXEC PGM=MORTGAGE
//STEPLIB DD DISP=SHR,DSN=S990071.COBOL.LOAD
//SYSOUT DD SYSOUT=*
//SYSIN DD DUMMY

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Output

DATE	PRINCIPAL	ADDTL PMT	INTEREST	PAYMENT	BALANCE	TOTAL INT
01/08/2026	\$574.21	\$500.00	\$625.00	\$699.21	\$99,425.79	\$625.00
02/08/2026	\$577.80	\$500.00	\$621.41	\$699.21	\$98,847.99	\$1,246.41
03/08/2026	\$581.41	\$500.00	\$617.80	\$699.21	\$98,266.58	\$1,864.21
04/08/2026	\$585.04	\$500.00	\$614.17	\$699.21	\$97,681.54	\$2,478.38
05/08/2026	\$588.70	\$500.00	\$610.51	\$699.21	\$97,092.84	\$3,088.89
06/08/2026	\$592.38	\$500.00	\$606.83	\$699.21	\$96,500.46	\$3,695.72
07/08/2026	\$596.08	\$500.00	\$603.13	\$699.21	\$95,904.38	\$4,298.85
08/08/2026	\$599.81	\$500.00	\$599.40	\$699.21	\$95,304.57	\$4,898.25
09/08/2026	\$603.56	\$500.00	\$595.65	\$699.21	\$94,701.01	\$5,493.90
10/08/2026	\$607.33	\$500.00	\$591.88	\$699.21	\$94,093.68	\$6,085.78
11/08/2026	\$611.12	\$500.00	\$588.09	\$699.21	\$93,482.56	\$6,673.87
12/08/2026	\$614.94	\$500.00	\$584.27	\$699.21	\$92,867.62	\$7,258.14
01/08/2027	\$618.79	\$500.00	\$580.42	\$699.21	\$92,248.83	\$7,838.56
02/08/2027	\$622.65	\$500.00	\$576.56	\$699.21	\$91,626.18	\$8,415.12
03/08/2027	\$626.55	\$500.00	\$572.66	\$699.21	\$90,999.63	\$8,987.78
04/08/2027	\$630.46	\$500.00	\$568.75	\$699.21	\$90,369.17	\$9,556.53
05/08/2027	\$634.40	\$500.00	\$564.81	\$699.21	\$89,734.77	\$10,121.34
06/08/2027	\$638.37	\$500.00	\$560.84	\$699.21	\$89,096.40	\$10,682.18
07/08/2027	\$642.36	\$500.00	\$556.85	\$699.21	\$88,454.04	\$11,239.03
08/08/2027	\$646.37	\$500.00	\$552.84	\$699.21	\$87,807.67	\$11,791.87
09/08/2027	\$650.41	\$500.00	\$548.80	\$699.21	\$87,157.26	\$12,340.67
10/08/2027	\$654.48	\$500.00	\$544.73	\$699.21	\$86,502.78	\$12,885.40
11/08/2027	\$658.57	\$500.00	\$540.64	\$699.21	\$85,844.21	\$13,426.04
12/08/2027	\$662.68	\$500.00	\$536.53	\$699.21	\$85,181.53	\$13,962.57
01/08/2028	\$666.83	\$500.00	\$532.38	\$699.21	\$84,514.70	\$14,494.95
02/08/2028	\$670.99	\$500.00	\$528.22	\$699.21	\$83,843.71	\$15,023.17
03/08/2028	\$675.19	\$500.00	\$524.02	\$699.21	\$83,168.52	\$15,547.19
04/08/2028	\$679.41	\$500.00	\$519.80	\$699.21	\$82,489.11	\$16,066.99
05/08/2028	\$683.65	\$500.00	\$515.56	\$699.21	\$81,805.46	\$16,582.55
06/08/2028	\$687.93	\$500.00	\$511.28	\$699.21	\$81,117.53	\$17,093.83
07/08/2028	\$692.23	\$500.00	\$506.98	\$699.21	\$80,425.30	\$17,600.81

08/08/2028	\$696.55	\$500.00	\$502.66	\$699.21	\$79,728.75	\$18,103.47
09/08/2028	\$700.91	\$500.00	\$498.30	\$699.21	\$79,027.84	\$18,601.77
10/08/2028	\$705.29	\$500.00	\$493.92	\$699.21	\$78,322.55	\$19,095.69
11/08/2028	\$709.69	\$500.00	\$489.52	\$699.21	\$77,612.86	\$19,585.21
12/08/2028	\$714.13	\$500.00	\$485.08	\$699.21	\$76,898.73	\$20,070.29
01/08/2029	\$718.59	\$500.00	\$480.62	\$699.21	\$76,180.14	\$20,550.91
02/08/2029	\$723.08	\$500.00	\$476.13	\$699.21	\$75,457.06	\$21,027.04
03/08/2029	\$727.60	\$500.00	\$471.61	\$699.21	\$74,729.46	\$21,498.65
04/08/2029	\$732.15	\$500.00	\$467.06	\$699.21	\$73,997.31	\$21,965.71
05/08/2029	\$736.73	\$500.00	\$462.48	\$699.21	\$73,260.58	\$22,428.19
06/08/2029	\$741.33	\$500.00	\$457.88	\$699.21	\$72,519.25	\$22,886.07
07/08/2029	\$745.96	\$500.00	\$453.25	\$699.21	\$71,773.29	\$23,339.32
08/08/2029	\$750.63	\$500.00	\$448.58	\$699.21	\$71,022.66	\$23,787.90
09/08/2029	\$755.32	\$500.00	\$443.89	\$699.21	\$70,267.34	\$24,231.79
10/08/2029	\$760.04	\$500.00	\$439.17	\$699.21	\$69,507.30	\$24,670.96
11/08/2029	\$764.79	\$500.00	\$434.42	\$699.21	\$68,742.51	\$25,105.38
12/08/2029	\$769.57	\$500.00	\$429.64	\$699.21	\$67,972.94	\$25,535.02
01/08/2030	\$774.38	\$500.00	\$424.83	\$699.21	\$67,198.56	\$25,959.85
02/08/2030	\$779.22	\$500.00	\$419.99	\$699.21	\$66,419.34	\$26,379.84
03/08/2030	\$784.09	\$500.00	\$415.12	\$699.21	\$65,635.25	\$26,794.96
04/08/2030	\$788.99	\$500.00	\$410.22	\$699.21	\$64,846.26	\$27,205.18
05/08/2030	\$793.92	\$500.00	\$405.29	\$699.21	\$64,052.34	\$27,610.47
06/08/2030	\$798.88	\$500.00	\$400.33	\$699.21	\$63,253.46	\$28,010.80
07/08/2030	\$803.88	\$500.00	\$395.33	\$699.21	\$62,449.58	\$28,406.13
08/08/2030	\$808.90	\$500.00	\$390.31	\$699.21	\$61,640.68	\$28,796.44
09/08/2030	\$813.96	\$500.00	\$385.25	\$699.21	\$60,826.72	\$29,181.69
10/08/2030	\$819.04	\$500.00	\$380.17	\$699.21	\$60,007.68	\$29,561.86
11/08/2030	\$824.16	\$500.00	\$375.05	\$699.21	\$59,183.52	\$29,936.91
12/08/2030	\$829.31	\$500.00	\$369.90	\$699.21	\$58,354.21	\$30,306.81
01/08/2031	\$834.50	\$500.00	\$364.71	\$699.21	\$57,519.71	\$30,671.52
02/08/2031	\$839.71	\$500.00	\$359.50	\$699.21	\$56,680.00	\$31,031.02
03/08/2031	\$844.96	\$500.00	\$354.25	\$699.21	\$55,835.04	\$31,385.27
04/08/2031	\$850.24	\$500.00	\$348.97	\$699.21	\$54,984.80	\$31,734.24
05/08/2031	\$855.55	\$500.00	\$343.66	\$699.21	\$54,129.25	\$32,077.90
06/08/2031	\$860.90	\$500.00	\$338.31	\$699.21	\$53,268.35	\$32,416.21
07/08/2031	\$866.28	\$500.00	\$332.93	\$699.21	\$52,402.07	\$32,749.14
08/08/2031	\$871.70	\$500.00	\$327.51	\$699.21	\$51,530.37	\$33,076.65
09/08/2031	\$877.15	\$500.00	\$322.06	\$699.21	\$50,653.22	\$33,398.71
10/08/2031	\$882.63	\$500.00	\$316.58	\$699.21	\$49,770.59	\$33,715.29
11/08/2031	\$888.14	\$500.00	\$311.07	\$699.21	\$48,882.45	\$34,026.36
12/08/2031	\$893.69	\$500.00	\$305.52	\$699.21	\$47,988.76	\$34,331.88
01/08/2032	\$899.28	\$500.00	\$299.93	\$699.21	\$47,089.48	\$34,631.81
02/08/2032	\$904.90	\$500.00	\$294.31	\$699.21	\$46,184.58	\$34,926.12
03/08/2032	\$910.56	\$500.00	\$288.65	\$699.21	\$45,274.02	\$35,214.77

04/08/2032	\$916.25	\$500.00	\$282.96	\$699.21	\$44,357.77	\$35,497.73
05/08/2032	\$921.97	\$500.00	\$277.24	\$699.21	\$43,435.80	\$35,774.97
06/08/2032	\$927.74	\$500.00	\$271.47	\$699.21	\$42,508.06	\$36,046.44
07/08/2032	\$933.53	\$500.00	\$265.68	\$699.21	\$41,574.53	\$36,312.12
08/08/2032	\$939.37	\$500.00	\$259.84	\$699.21	\$40,635.16	\$36,571.96
09/08/2032	\$945.24	\$500.00	\$253.97	\$699.21	\$39,689.92	\$36,825.93
10/08/2032	\$951.15	\$500.00	\$248.06	\$699.21	\$38,738.77	\$37,073.99
11/08/2032	\$957.09	\$500.00	\$242.12	\$699.21	\$37,781.68	\$37,316.11
12/08/2032	\$963.07	\$500.00	\$236.14	\$699.21	\$36,818.61	\$37,552.25
01/08/2033	\$969.09	\$500.00	\$230.12	\$699.21	\$35,849.52	\$37,782.37
02/08/2033	\$975.15	\$500.00	\$224.06	\$699.21	\$34,874.37	\$38,006.43
03/08/2033	\$981.25	\$500.00	\$217.96	\$699.21	\$33,893.12	\$38,224.39
04/08/2033	\$987.38	\$500.00	\$211.83	\$699.21	\$32,905.74	\$38,436.22
05/08/2033	\$993.55	\$500.00	\$205.66	\$699.21	\$31,912.19	\$38,641.88
06/08/2033	\$999.76	\$500.00	\$199.45	\$699.21	\$30,912.43	\$38,841.33
07/08/2033	\$1,006.01	\$500.00	\$193.20	\$699.21	\$29,906.42	\$39,034.53
08/08/2033	\$1,012.29	\$500.00	\$186.92	\$699.21	\$28,894.13	\$39,221.45
09/08/2033	\$1,018.62	\$500.00	\$180.59	\$699.21	\$27,875.51	\$39,402.04
10/08/2033	\$1,024.99	\$500.00	\$174.22	\$699.21	\$26,850.52	\$39,576.26
11/08/2033	\$1,031.39	\$500.00	\$167.82	\$699.21	\$25,819.13	\$39,744.08
12/08/2033	\$1,037.84	\$500.00	\$161.37	\$699.21	\$24,781.29	\$39,905.45
01/08/2034	\$1,044.33	\$500.00	\$154.88	\$699.21	\$23,736.96	\$40,060.33
02/08/2034	\$1,050.85	\$500.00	\$148.36	\$699.21	\$22,686.11	\$40,208.69
03/08/2034	\$1,057.42	\$500.00	\$141.79	\$699.21	\$21,628.69	\$40,350.48
04/08/2034	\$1,064.03	\$500.00	\$135.18	\$699.21	\$20,564.66	\$40,485.66
05/08/2034	\$1,070.68	\$500.00	\$128.53	\$699.21	\$19,493.98	\$40,614.19
06/08/2034	\$1,077.37	\$500.00	\$121.84	\$699.21	\$18,416.61	\$40,736.03
07/08/2034	\$1,084.11	\$500.00	\$115.10	\$699.21	\$17,332.50	\$40,851.13
08/08/2034	\$1,090.88	\$500.00	\$108.33	\$699.21	\$16,241.62	\$40,959.46
09/08/2034	\$1,097.70	\$500.00	\$101.51	\$699.21	\$15,143.92	\$41,060.97
10/08/2034	\$1,104.56	\$500.00	\$94.65	\$699.21	\$14,039.36	\$41,155.62
11/08/2034	\$1,111.46	\$500.00	\$87.75	\$699.21	\$12,927.90	\$41,243.37
12/08/2034	\$1,118.41	\$500.00	\$80.80	\$699.21	\$11,809.49	\$41,324.17
01/08/2035	\$1,125.40	\$500.00	\$73.81	\$699.21	\$10,684.09	\$41,397.98
02/08/2035	\$1,132.43	\$500.00	\$66.78	\$699.21	\$9,551.66	\$41,464.76
03/08/2035	\$1,139.51	\$500.00	\$59.70	\$699.21	\$8,412.15	\$41,524.46
04/08/2035	\$1,146.63	\$500.00	\$52.58	\$699.21	\$7,265.52	\$41,577.04
05/08/2035	\$1,153.80	\$500.00	\$45.41	\$699.21	\$6,111.72	\$41,622.45
06/08/2035	\$1,161.01	\$500.00	\$38.20	\$699.21	\$4,950.71	\$41,660.65
07/08/2035	\$1,168.27	\$500.00	\$30.94	\$699.21	\$3,782.44	\$41,691.59
08/08/2035	\$1,175.57	\$500.00	\$23.64	\$699.21	\$2,606.87	\$41,715.23
09/08/2035	\$1,182.92	\$500.00	\$16.29	\$699.21	\$1,423.95	\$41,731.52
10/08/2035	\$1,190.31	\$500.00	\$8.90	\$699.21	\$233.64	\$41,740.42
11/08/2035	\$233.64	\$500.00	\$1.46	\$699.21	\$0.00	\$41,741.88

TOTAL INTEREST PAID: \$41,741.88

1. What worked well? Breaking the program into smaller pieces worked well. Once the core payment and interest calculations were functioning, the rest of the structure became easier to manage. Using edited PIC formats helped produce clean output, and the date intrinsic functions removed a lot of manual work.
2. What did you have to look up? I had to look up the correct syntax for the ANNUITY function and how Enterprise COBOL handles it. I also looked up the proper way to work with dates using CURRENT-DATE, INTEGER-OF-DATE, and DATE-OF-INTEGGER because COBOL does not have a built-in one month increment.
3. What did you have to ask for assistance with? I needed help fixing alignment problems and making sure none of the lines passed column seventy two. I also asked for help with the correct way to close PERFORM loops and how to format STRING statements so that the compiler would accept them.
4. What did you learn and what was reinforced by doing this project? This project reinforced how strict COBOL is with structure and formatting. It reminded me that small details can break a program. I also gained more confidence working with intrinsic functions and formatting financial output. The process showed the value of organizing logic in a clear and consistent way.
5. For the accelerated principal payments, was the ROI larger or smaller than you expected? Why? The ROI was larger than expected. Extra principal paid early reduces the balance before most of the interest is charged. Since interest is calculated on the remaining balance, early reductions generate long-term savings that add up faster than most people anticipate.
6. For accelerated payments, where is the MOST dramatic saving in interest realized? The most dramatic savings happen during the early years of the loan. At the beginning of a mortgage most of the payment goes toward interest. Reducing the principal early lowers every future interest charge, so the impact is strongest in the first part of the loan.