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Remember: the more we make programmers do, the more likely they are going to make a mistake

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This concentrated the programmer's mind wonderfully!

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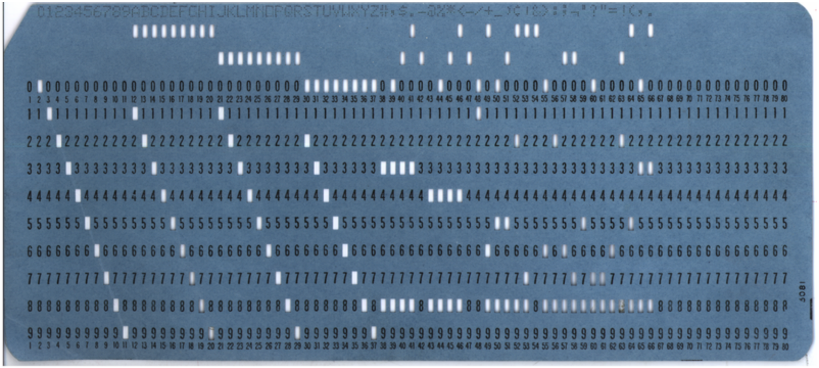

From Wikipedia. Encodes a single 80 character line

History

From Wikipedia. 5 and 8 hole paper tapes

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This made programming and program management easier, but there was still lots of human intervention needed

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So the operators would load many programs on to a fast medium, such as magnetic tape, and the computer would load and run them as fast as hardware allowed

This was called *spooling*, the first instance of addressing the disparity between human and computer speeds

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Again, this was because printers are slower than computers

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This would be directed by a *job control language*

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Of course “JCL” means “Job Control Language”, but JCL was just one of a few job control languages

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```
//IS198CPY JOB (IS198T30500),'COPY JOB',CLASS=L,MSGCLASS=X
//COPY01   EXEC PGM=IEBGENER
//SYSPRINT DD  SYSOUT=*
//SYSUT1   DD  DSN=OLDFILE,DISP=SHR
//SYSUT2   DD  DSN=NEWFILE,
//             DISP=(NEW,CATLG,DELETE),
//             SPACE=(CYL,(40,5),RLSE),
//             DCB=(LRECL=115,BLKSIZE=1150)
//SYSIN    DD  DUMMY
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(From Wikipedia) Any guesses?

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This copies OLDFILE to NEWFILE
This would be set on 9 punched cards

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A Fortran program, with data:

```
//CONVERT JOB USER=UGA001,MSGCLASS=6,NOTIFY=UGA001
//*MAIN CLASS=NITE,LINES=40,ORG=UGAIBM1.LOCAL
// EXEC FORTVCLG,REGION=2000K
//FORT.SYSIN DD *
       READ(5,10) CENT
    10 FORMAT(F6.2)
       FAHR=(CENT*9.0/5.0)+32.0
       WRITE(6,20) CENT,FAHR
    20 FORMAT(F6.2,' CENT = ',F6,2,'FAHR')
       STOP
       END
/*
//GO.SYSIN DD *
100.00
/*
//
```

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If a job ran out of its allotted time or space it would be killed

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Running in batches is more efficient, as we spend more time running our programs and less time messing around in the overheads of loading and unloading

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Exercise: look up *Portable Batch System*, PBS and compare with JCL

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