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**AND NOW FOR
SOMETHING
COMPLETELY
DIFFERENT**



Panorama

- RAM based database, super fast
- In continuous development since 1983
 - Non-forked source code for 27 years

<http://www.provue.com/panorama>

Major Panorama Code Transitions

1983	Alpha Micro (68K based minicomputer)
1984	Macintosh 128 (68K)
1999	Macintosh OS 9 (PPC) & Windows 98 (x86)
2003	Mac OS X (PPC)
Today	Mac OS X (Intel & PPC) & Windows 7 (x86)



DEC PDP-11



16 bit Minicomputer (1970's)

MACWORLD

Premier Issue \$4.00

Canada \$4.75

The Macintosh Magazine

Macintosh

Apple's Remarkable
New Personal
Computer

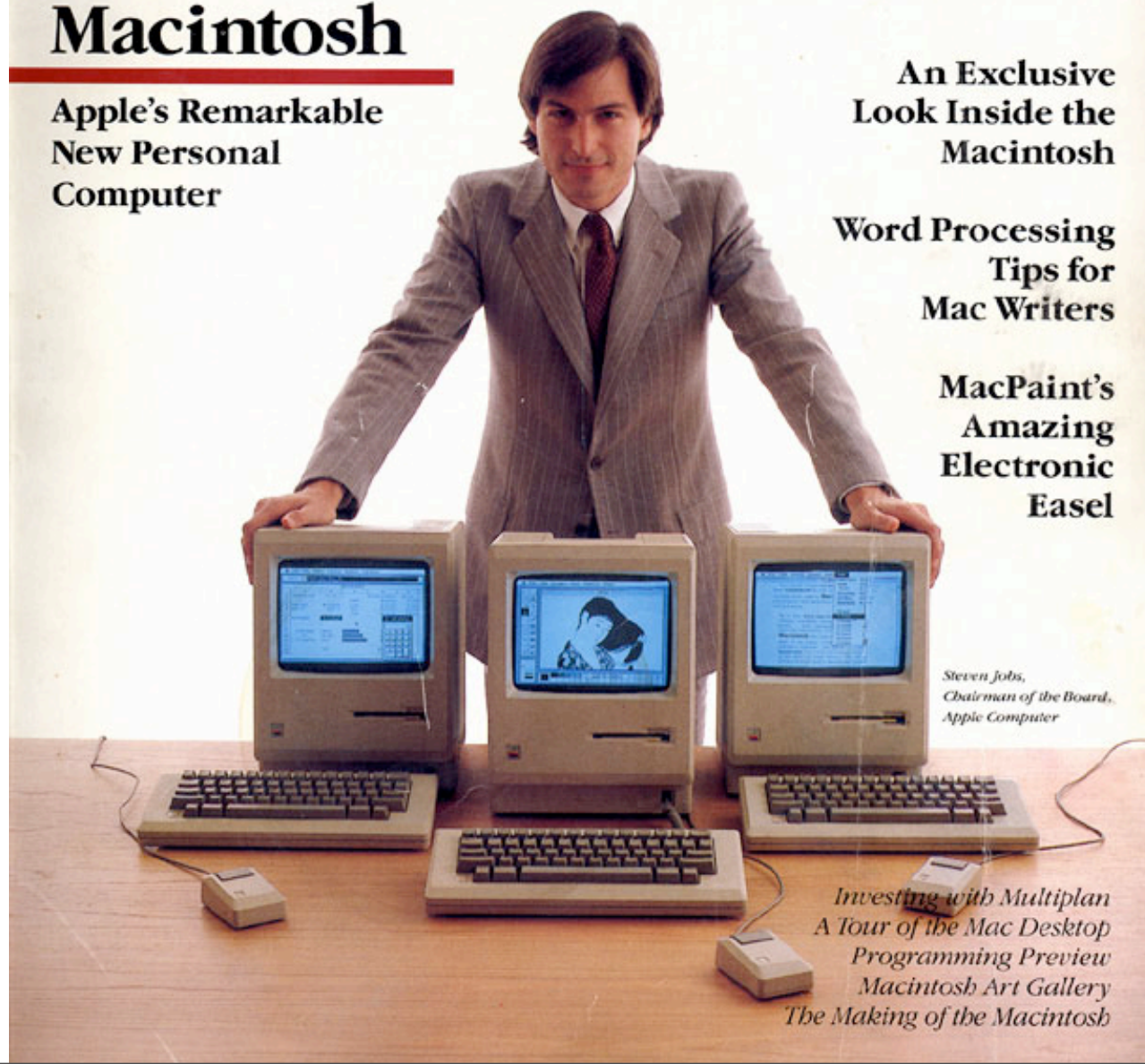
An Exclusive
Look Inside the
Macintosh

Word Processing
Tips for
Mac Writers

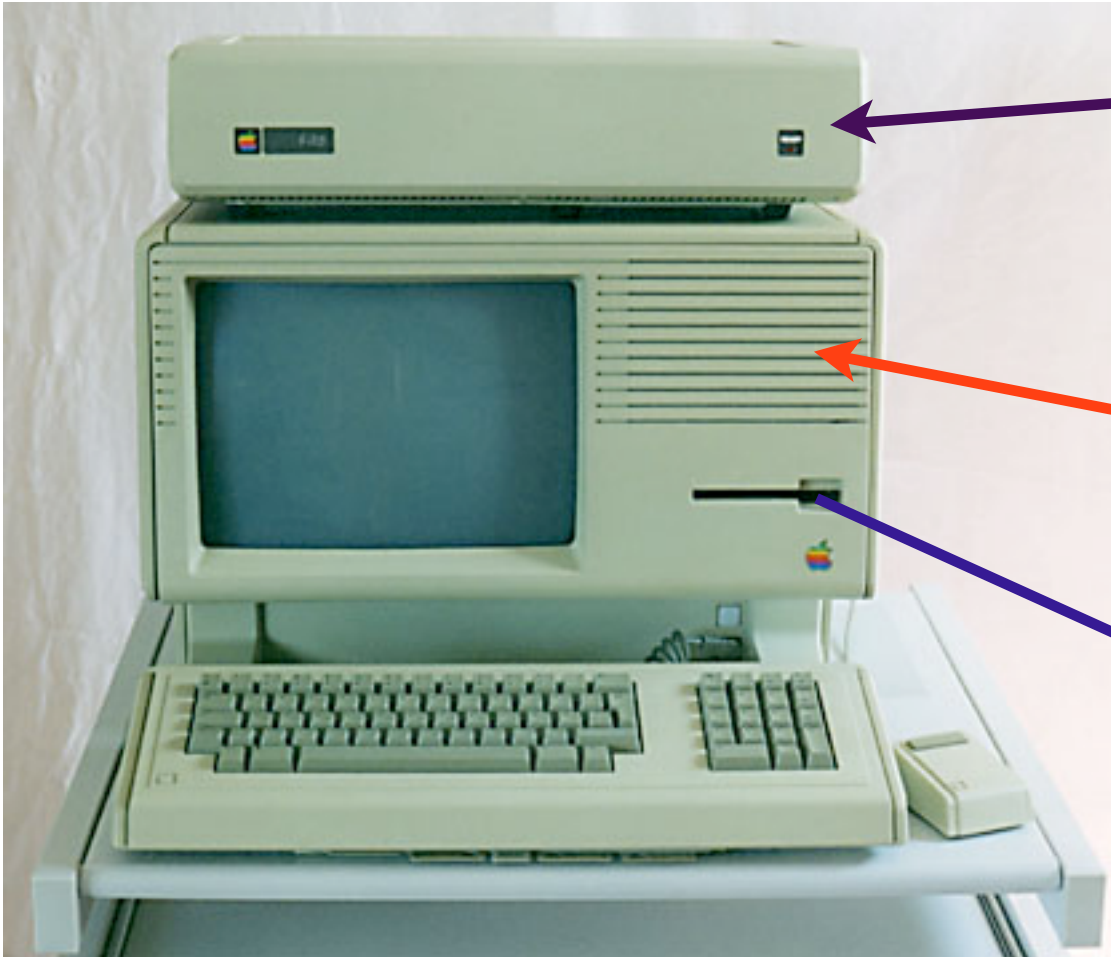
MacPaint's
Amazing
Electronic
Easel

Steven Jobs,
Chairman of the Board,
Apple Computer

Investing with Multiplan
A Tour of the Mac Desktop
Programming Preview
Macintosh Art Gallery
The Making of the Macintosh



Apple Lisa



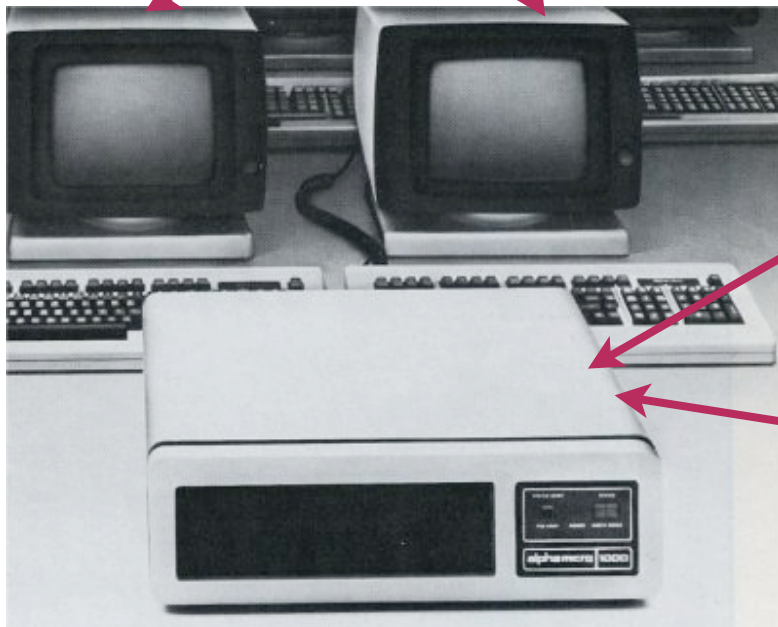
Very slow 5 megabyte (!!)
hard drive

Pascal compiler often
indicates syntax errors by
crashing during compile

Transfer compiler
output to Mac via
floppy disk
(sneakernet)

Alpha Micro (68k based minicomputer)

Multi-user, including source code management for multiple programmers



4 megabytes of RAM
100 meg hard drive
(both huge by 1984 standards)

Fast, assembler & linker with
powerful macro capability
(by 1984 standards)

PDP-11 code?

Alpha Micro



- Founded 1975
- Microprocessor based clone of PDP-11
- Programmer friendly processor architecture (C was originally developed on PDP-11's)

5 chip microprocessor

PDP-11 Architecture

- Programmer friendly architecture
- No “weird” rules or modes
 - 8 orthogonal registers
 - 8 orthogonal addressing modes
 - Memory mapped I/O
- C and UNIX first developed on PDP-11

“PDP-11 programmers viewed the assembly language as easy to learn and uniquely elegant”

http://en.wikipedia.org/wiki/PDP-11_architecture

Alpha Micro “PDP-11” Experience 1977-1981

- Worked at Alpha Micro 1977-1980
- Went “indie” in 1980
 - “Life is good”

Licensing problems...

(life is not so good...)

Motorola 68k (1981)



ETHOS

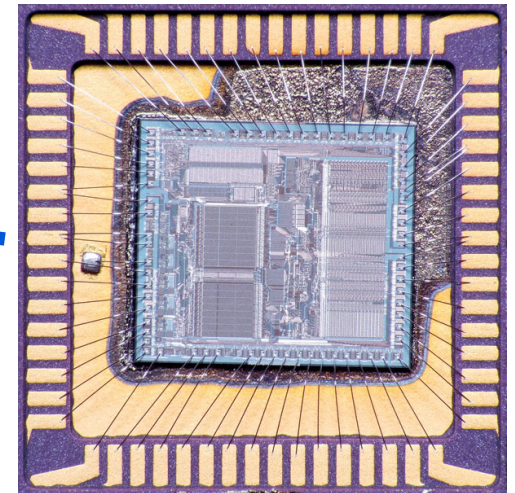
**MINI, MAXI,
O ALPHA MICRO?**

Sempre più difficile scegliere un computer. Tanti nomi, tante promesse, tanti dubbi. Allora, vediamo insieme. La capacità, intanto. Spesso si sceglie un sistema troppo piccolo, che non può crescere, solo perché apparentemente costa meno. Bene, Alpha Micro 1000, per esempio, non costa molto di più di un buon "personal", ma se solo avete bisogno di due posti di lavoro Alpha Micro costa meno. Fai due conti e vedi cosa ti conviene.

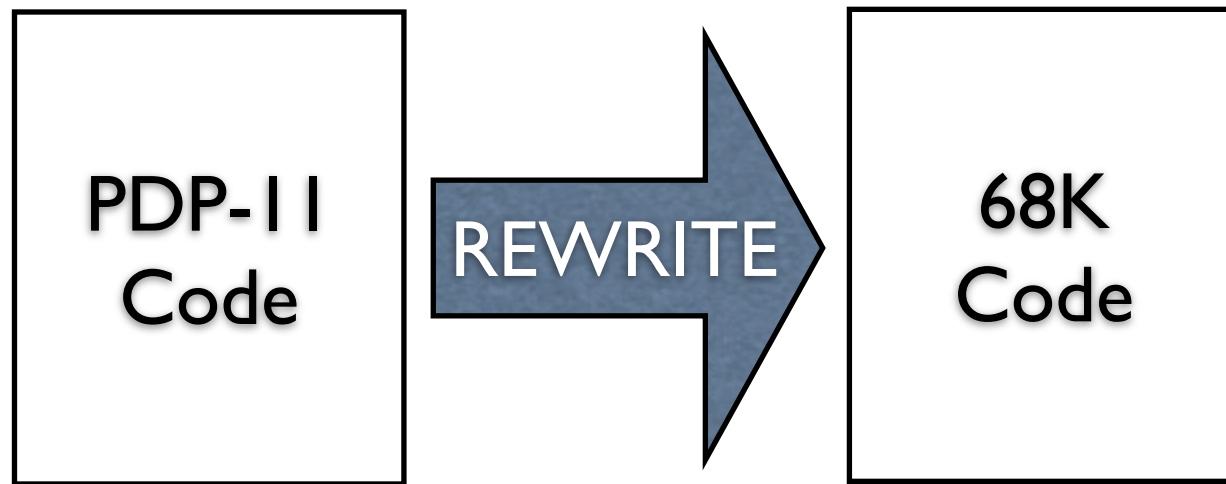
Altri, invece, scelgono sistemi inutilmente grandi

SHR s.r.l. Distribuzione esclusiva per l'Italia
via Faentina 175/A - 48010 Fornace Zarattini (RA)
tel. 0544/463200.

ALPHA MICRO



Converting from PDP-11 to 68k



Cons of Rewrite Strategy

- Lots of work!
- Makes new bugs
- Compared to PDP-11, 68k assembly programming sucks...
 - non-orthogonal
 - lots of weird modes & exceptions

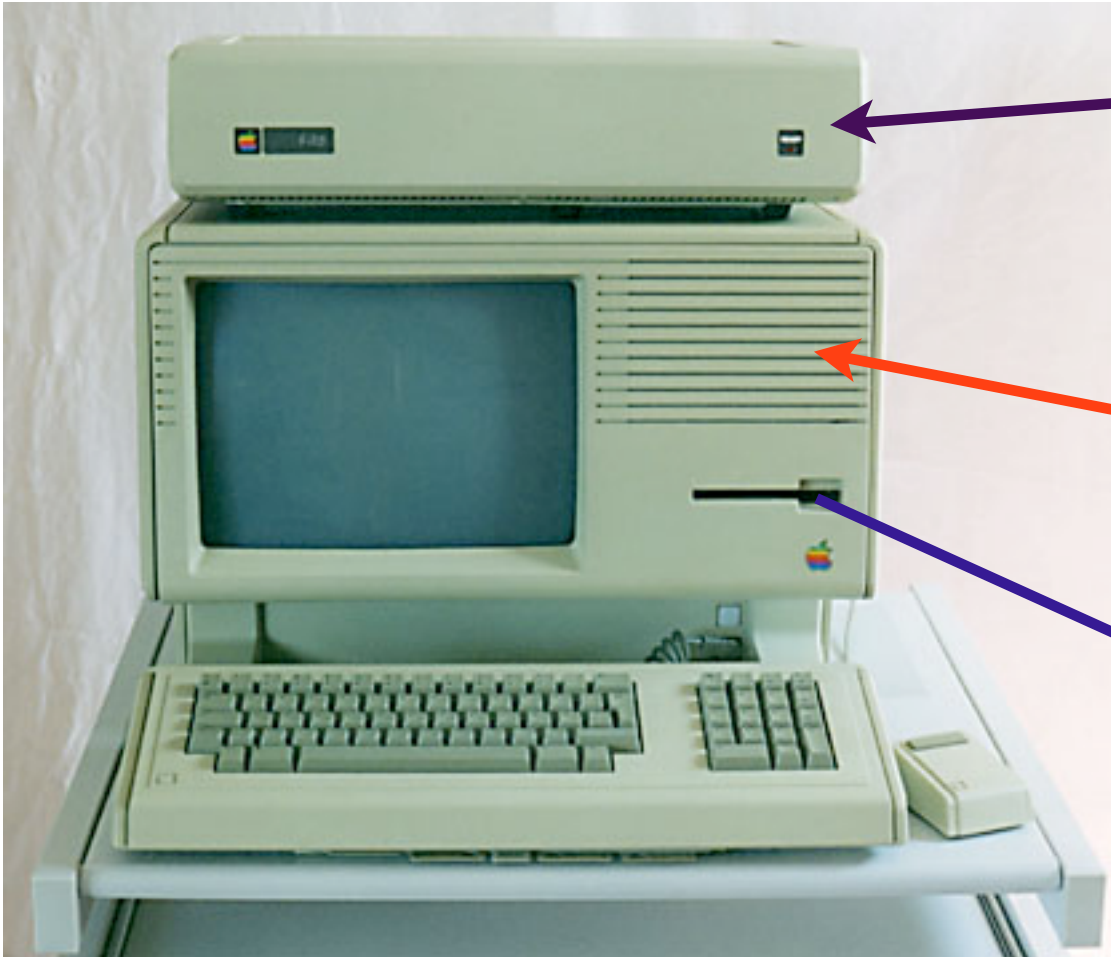
Converting from PDP-11 to 68k



40,000 lines ported in 10 weeks

easy, fast — *let's keep writing new code in PDP-11!*

Apple Lisa

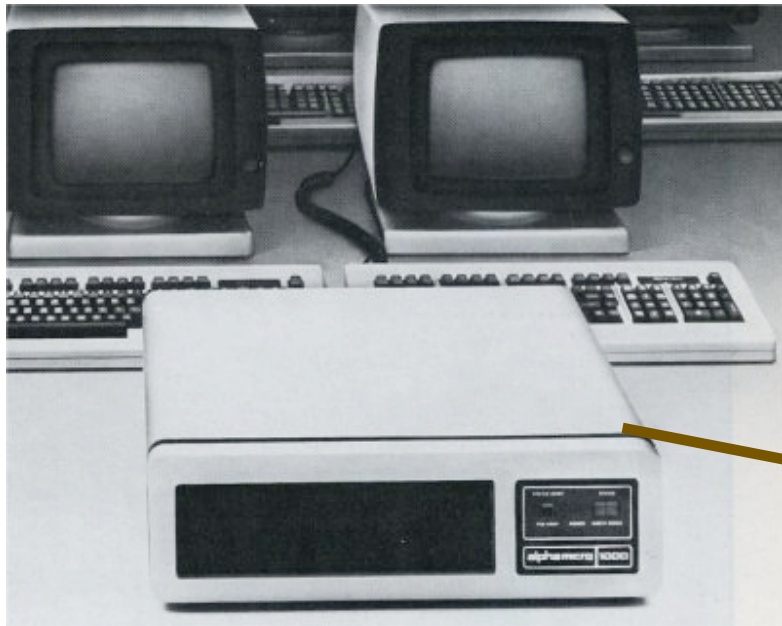


Very slow 5 megabyte (!!)
hard drive

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Transfer compiler
output to Mac via
floppy disk
(sneakernet)

Cross Development from Alpha Micro Minicomputer



Small RS-232 transmit program

Rewritten MacOS header files
for PDP-11 assembler

Transfer to Mac via
RS-232 Serial Link



Small RS-232
receive program



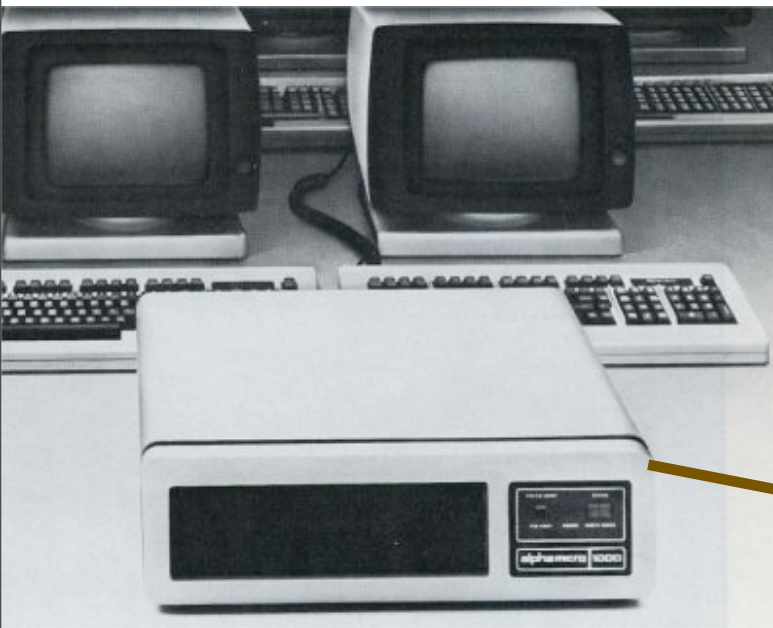
Debug on Mac 128k

Shipping!

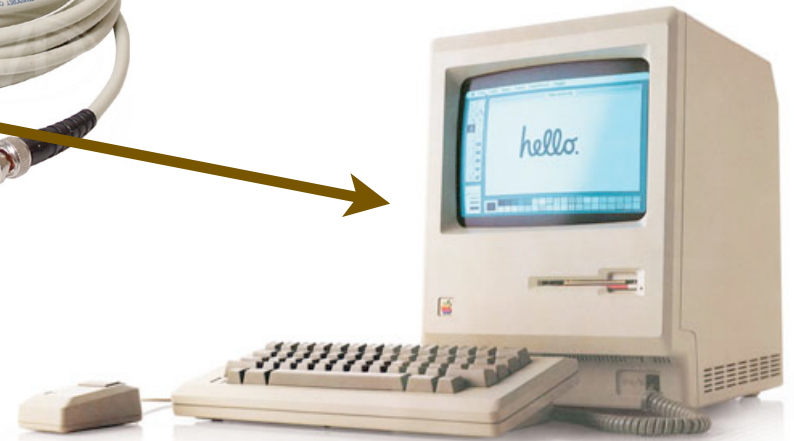


- Port from Alpha Micro version started in March '84
- Alpha version shown to Apple Evangelists in May '84
- Demo'd beta in Apple booth at NCC in July '84
- Shipped 1.0 version in September 1984

Cross Development from Alpha Micro Minicomputer (1989 version)



Transfer to Mac via
Video Link



The screenshot shows a Macintosh desktop with a 'CreateMake Options' dialog box open. The dialog is for creating a makefile named 'Count'. It has tabs for Program Name, Program Type, Target System, and Command Line. The Program Name tab is active, showing 'Count' in the text field. The Program Type tab shows 'Code Resource' selected. The Target System tab shows 'Fat Binary' selected. The Command Line tab shows a command line for building a program. The dialog also has buttons for 'Source Files...', 'Optimization...', 'Exported Symbols...', '68K Hardware Options...', 'Code Resource Options...', and 'Include File Options...'. The background shows a window titled '350MB:Development:MPW:Worksheet' with a list of files and a code editor showing a C program snippet.

CreateMake Options

Program Name Count

Source Files...

Program Type

- ☐ Application
- ☐ Tool
- ☐ Desk Accessory
- ☒ Code Resource
- ☐ SIOW App.
- ☐ Shared Library

Target System

- ☐ 68k Only
- ☐ PowerPC Only
- ☒ Fat Binary

Creator ????

☐ Debugger info

Optimization...

Exported Symbols...

68K Hardware Options...

Code Resource Options...

Include File Options...

Command Line

CreateMake Count -CR :Examples:CEXamples:Count.c :Examples:CEXamples:Count.r -fat -opt speed4

Help

Create a simple makefile for building a program for 68000-based Macintosh, PowerPC Macintosh, or both ('Fat Binary').

Cancel

CreateMake

4.0

350MB:Development:MPW:Worksheet

Close window... # Close [-y | -n | -c] [-a | window...]

Count file... # Count [-l] [-c] [file...] < file > counts

Cut /RegExp/... # Cut [-c count] selection [window]

Date option... # Date [-a | -s] [-d | -t] [-c seconds] | [-n] > date

Delete file... # Delete [-y | -n | -c] [-i] [-p] name... > progress

Duplicate name... target # Duplicate [-y | -n | -c] [-p] [-d | -n] name... target > progress

Echo parameter... # Echo [-n] [parameter...] > parameters

Eject volume... # Eject [-m] volume...

Equal name... target

Execute...

Files file...

Find /RegExp/...

Line number...

NewFolder name...

Open name...

Parameters parameter...

Print file...

Replace /RegExp/ string...

Save window...

Search /RegExp/ file...

Set name value...

Volumes volume...

Which name...

Searching

There occasionally

structure for insta

accomplish this:

search /RegExp/ `fi

Example:

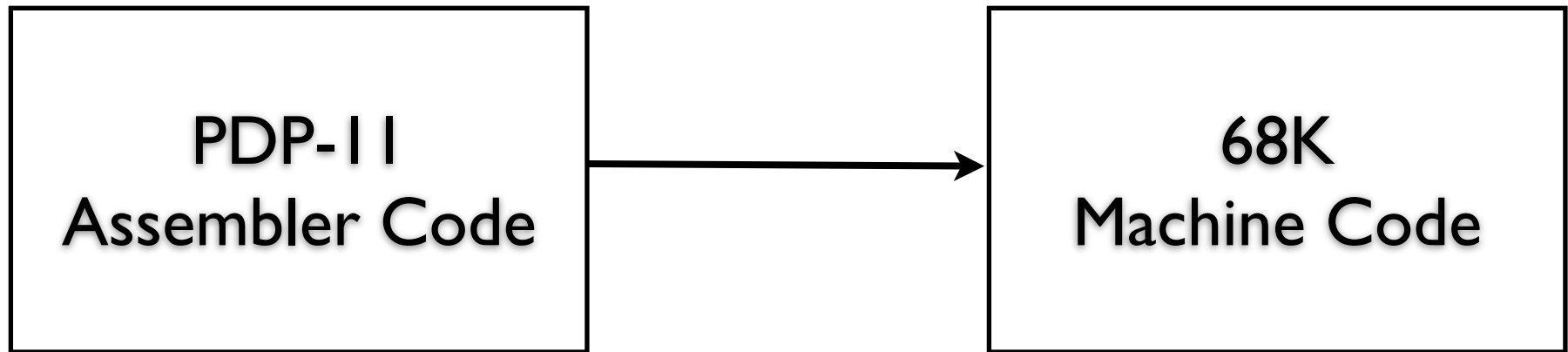
search /BitMapTonegray/ files 0 1 1 1

CreateMake...

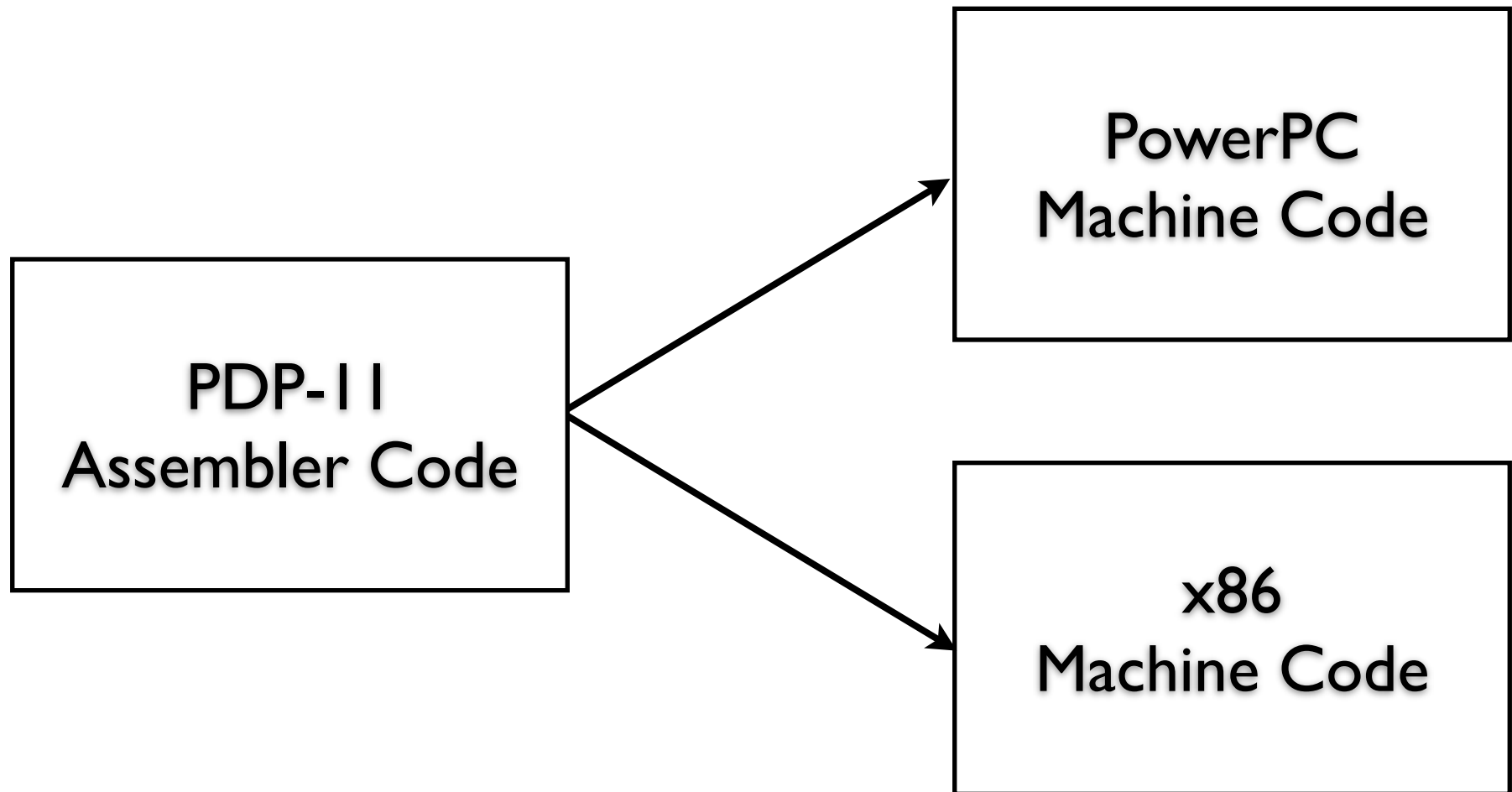
```
while ((charsRead = read(input, inputBuffer, InputSize)) > 0) {
    ptr = inputBuffer;
    inputBuffer[charsRead] = 0;
    characters += charsRead;
    while ((c = *ptr++) != 0 || ptr <= &inputBuffer[charsRead]) {
        if (c == '\n') {
            lines++;
            if ((lines & 0x0F) == 0)
                SpinCursor(1);
        }
    }
}
```

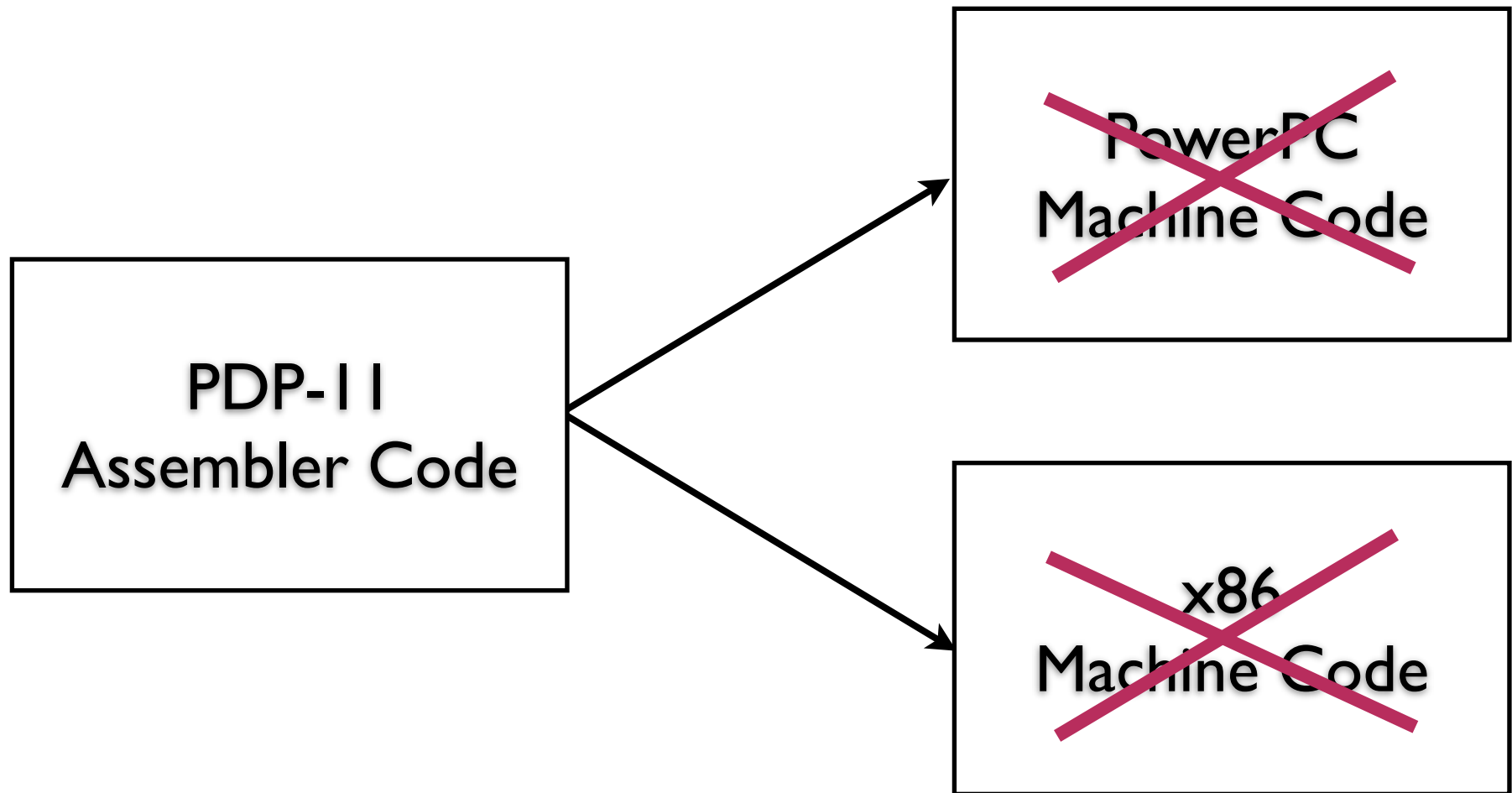
3 weeks for clean room rewrite of assembler/linker software (in C)

Machine Code Generation

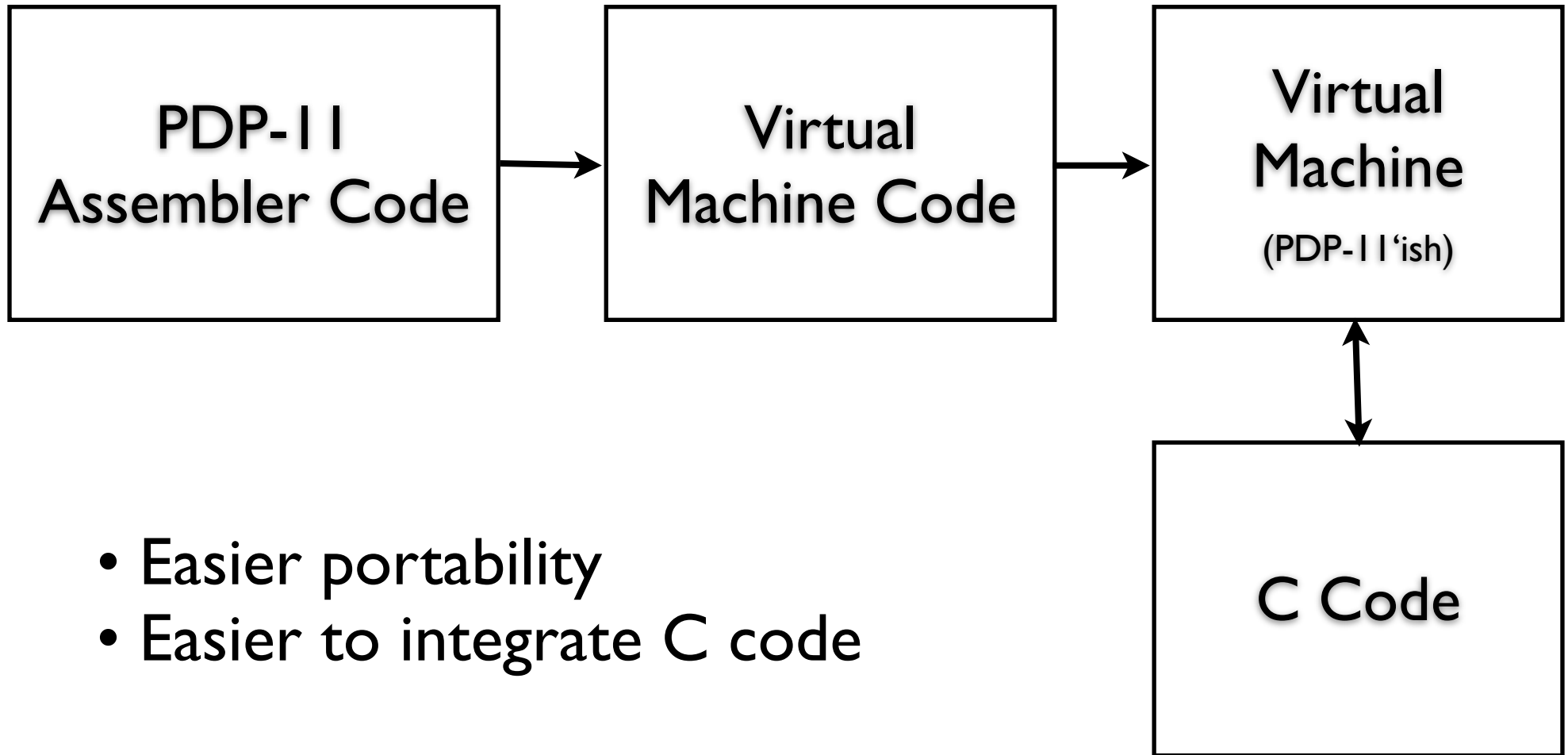


Machine Code Generation



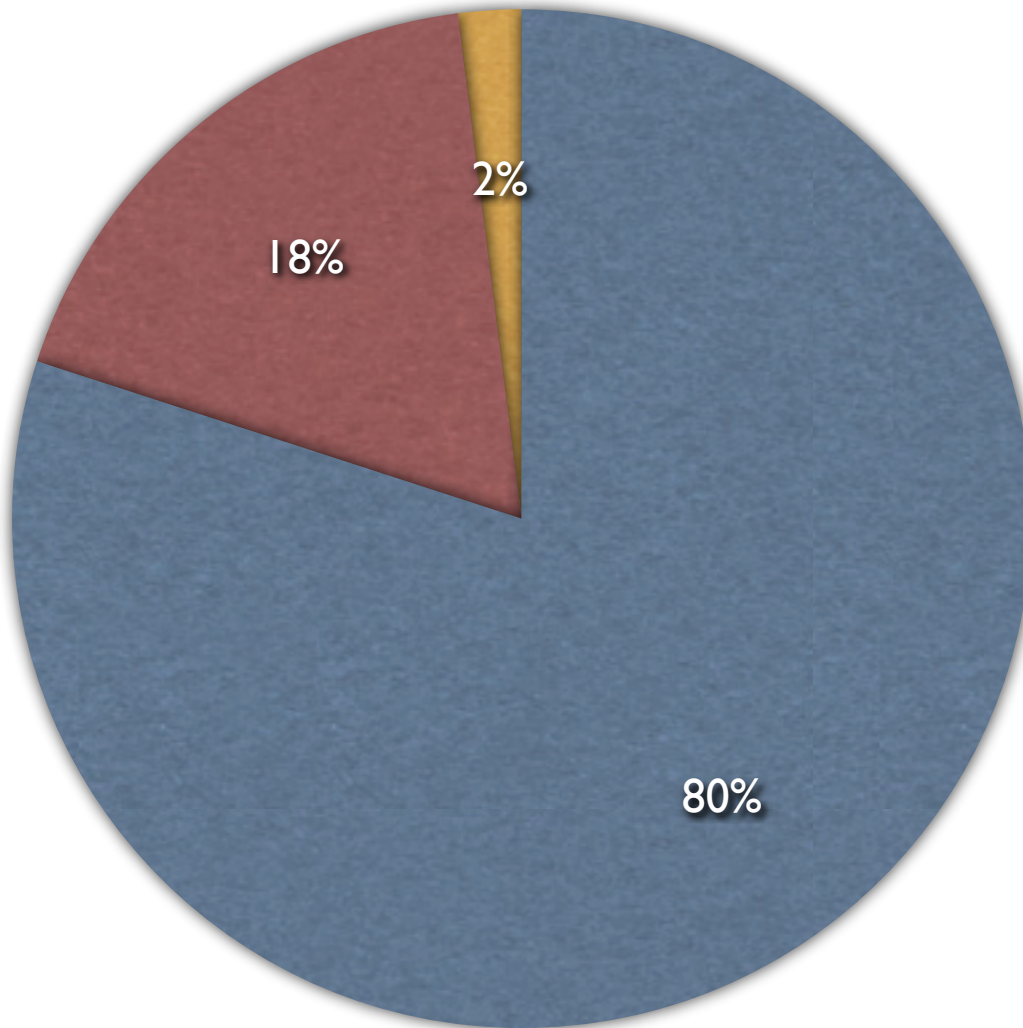


Virtual Machine



- Easier portability
- Easier to integrate C code

Source Code Languages



- Assembly Code
- C Code
- Assembler converted into C

Translating assembly code into C



8000 lines > 125 bugs

Panorama 1.0, 1.5, 2.0, 2.1, 3.0, 3.1, 4.0, 5.0, 5.5, 6.0



HobbyShopSales:Aqua Order Form

SEARCH DATA ADD DELETE PRINT VCARD DIAL EMAIL SYNC

Contact Information

Name: Laori Donnell
Address: 41 S.E. Millwood Ter
South Holland IL 60473
Country:
Phone: (312) 872-1056
Fax:
E-Mail:
Payment Information
Payment Type: American Express
Card Number: 3027-3046-3319-8380
Qty Description
1 Conrail SW1500
1 Santa Fe F7B
1 Canadian Pacific SW7
1 Western Pacific GP40-2
1 UP 40' Single Dome Tank Car
1 SP 50' Double Door Box
1 Pennsy 40' Stock Car

HobbyShopSales

Date	Last	First	Address	City	State
01/10/10	Josal	Mildred	236 N Porter Pl	Elbow Lake	MN
01/11/10	Scoville	Jean	5664 Cornell St.	Seabrook	TX
01/11/10	Hartley	Phyllis	38515 N.E. Lee Rd.	Wichita	KS
01/11/10	Block	Edith	732 S. Whitney Ter	Inverness	FL
01/11/10	Donnell	Laori	41 S.E. Millwood Ter	South Holland	IL
01/11/10	Watkins	Sarah	47571 N. Ashland Blvd	Pensacola	FL
01/11/10	Burdett	Alan	43792 S Allen Blvd	Shelby Townsh	MI
01/12/10	Olsen	Rachel	25788 E Ellis Blvd.	Sherwood	OR
01/12/10	Gross	Alan	40832 N.E. Cliff Ave	Portland	ME
01/12/10	Franks	Patrick	733 S.W Penrith Cir.	West Grove	PA
01/13/10	Gardener	Karen	699 N. Hart Cir.	Port Angeles	WA
01/13/10	Isler	Gary	8467 E. Benton Ave.	Mason City	IA
01/13/10	Davis	Joan	5501 N Chesapeake Rd	Alexandria	VA
01/13/10	Hardy	Catherine	5418 N. Waterman Rd	North Garden	VA
01/13/10	Bradford	Henry	494 S.W Lincoln Cir	Norman	OK
01/14/10	Burton	Carolyn	580 South Hope Circle	Ogden	UT
01/14/10	Travillian	Doris	349 W Plummer Ct	Allentown	PA
01/14/10	Mester	Gloria	44837 West Kendall Pkwy	Honolulu	HI
01/14/10	Marshall	Richard	409 S. Crest Trail	Windfield	PA
01/15/10	Gamble	Andrew	8974 S Heather Rt	Longmont	CO
01/15/10	Howell	Diana	834 S.W Bonner Cir.	Waco	TX
01/15/10	Flagg	Frances	22167 N. Hayden Pkwy	Portland	OR
01/15/10	Irwin	Helen	316 W. Hughes Ter	Phoenix	AZ
01/15/10	Jensen	Michelle	9530 E Albany St.	Riverside	CA
01/16/10	Gorman	Kenneth	6378 S.E. Nelson St	Memphis	TN
01/16/10	Hay	Karen	242 East Berkshire Trail	Woodland Hills	CA
01/16/10	Dennis	Sandra	40358 W. Windsor Blvd	Far Rockaway	NY
01/16/10	Blanc	Christine	7840 E. Cabrillo Avenue	Tulsa	OK
01/17/10	Byrum	Frank	434 N.W. Wisconsin Ter	Lansing	KS

1257 visible/1257 total

By the way, we were also implementing new features all along...






New development - *Eating our own “dog food”*



Built-in Dynamic (Interpreted) Scripting Language

Find/Select Dialog

Find/Select Records in Corporate Checkbook

Cancel Find Select

ALL of the following are true: ☒ Live Preview

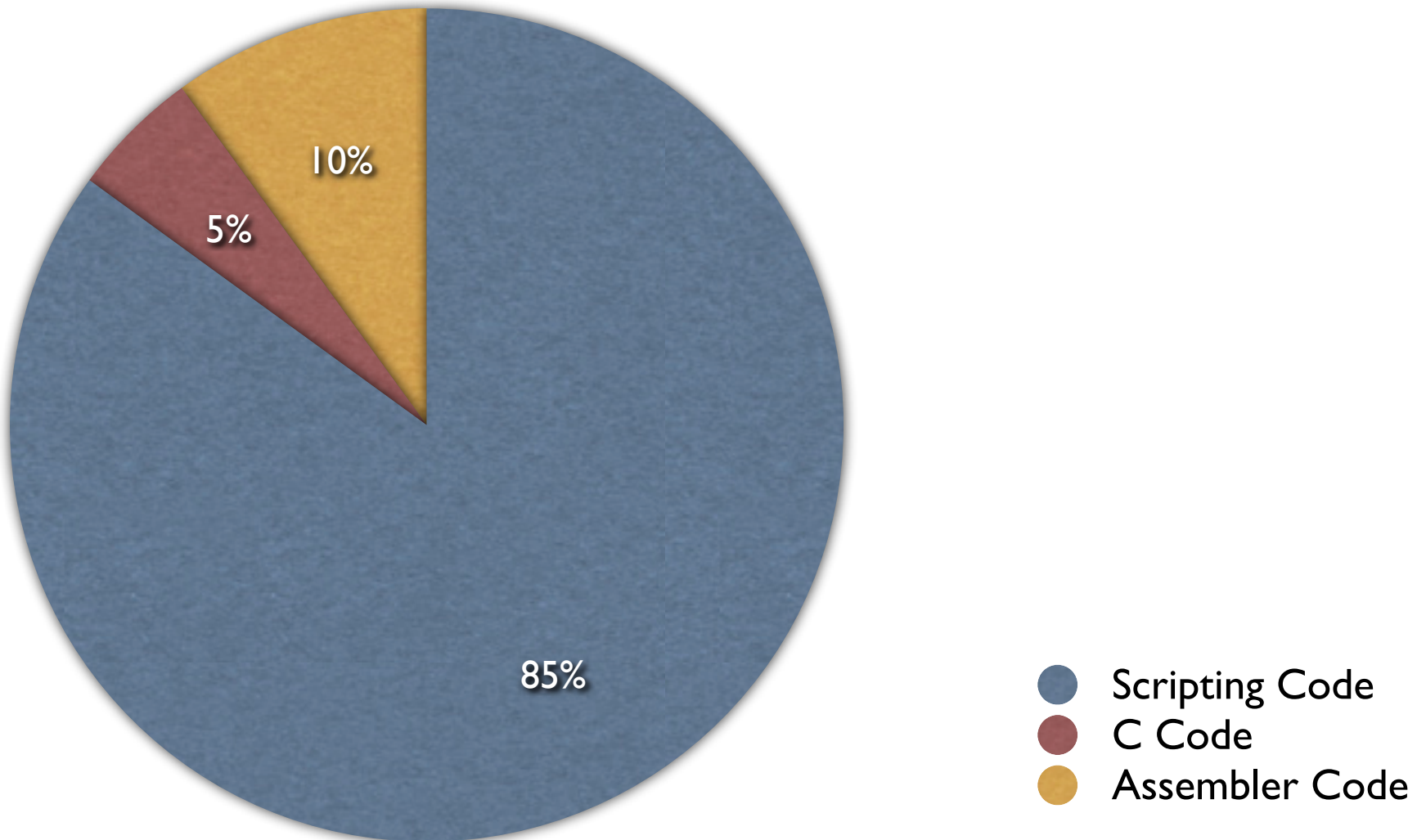
Any field contains ship

Debit Is Greater Than 100

Date	Check	PayTo	Category	Memo	Debit	Credit	Balance
May 1, 2009	106	UPS	Shipping		185.92		17,850.54
May 19, 2009	130	FedEx	Shipping	Invoice 75951	160.97		17,517.78
May 19, 2009	132	Champion Trucking	Shipping	Invoice 26309	171.79		17,678.75
Jun 2, 2009	147	Champion Trucking	Shipping	Invoice 67943	151.04		17,412.46
Jul 2, 2009	192	FedEx	Shipping	Invoice 18129	178.42		11,751.51
Jul 2, 2009	195	Post Office	Shipping		250.99		11,929.93
Jul 9, 2009	199	Airborne	Shipping	Invoice 48673	117.35		11,568.95
Jul 16, 2009	205	Post Office	Shipping		168.39		11,400.56
Jul 23, 2009	210	FedEx	Shipping	Invoice 81536	109.31		11,291.25
Jul 30, 2009	219	Post Office	Shipping		305.84		10,985.41

50 matches/515 total

Panorama 6 New Code



Debugging thoughts...

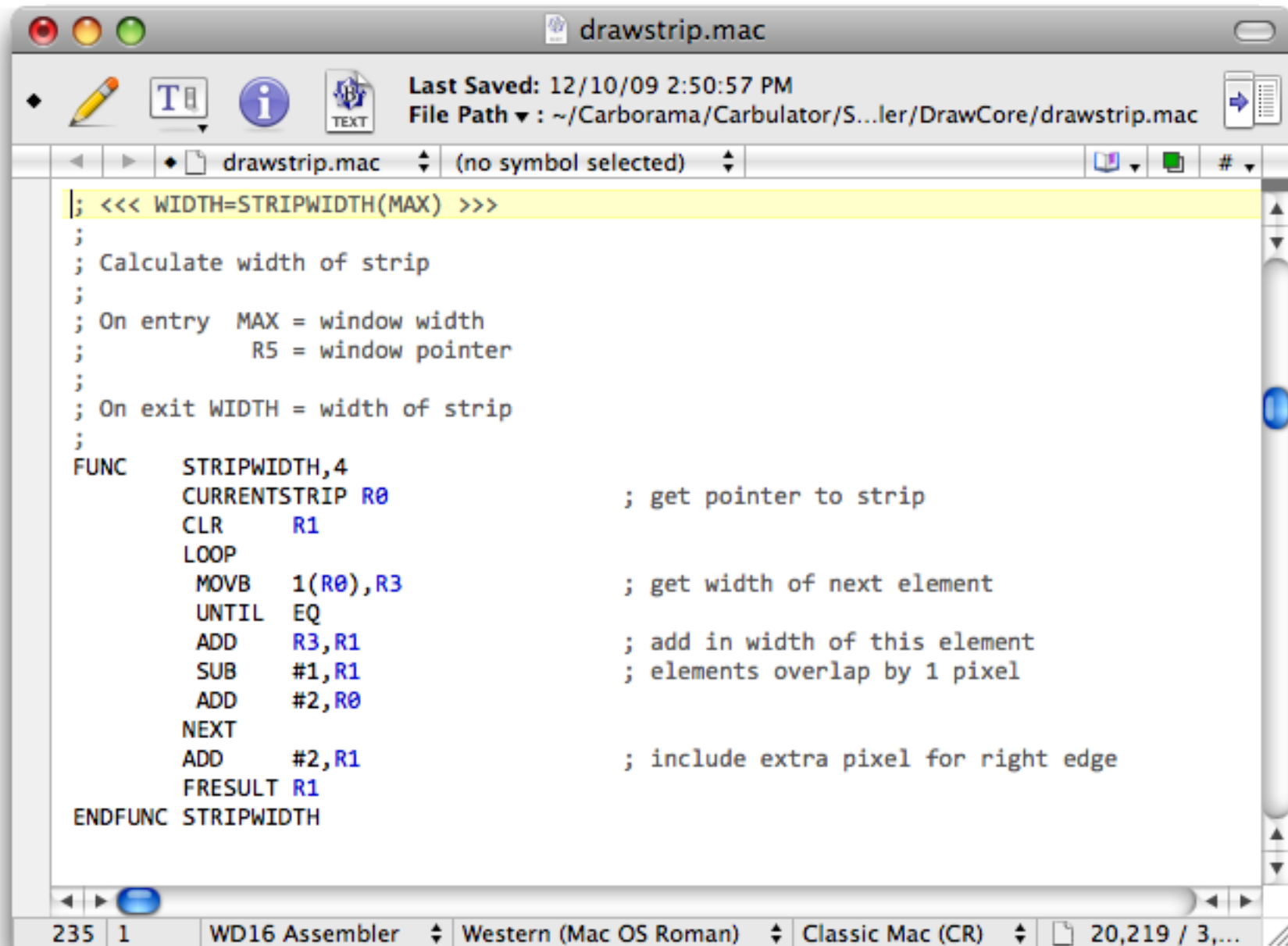
Rapid Build Turnaround

- C build 30-90 seconds
- Assembly build 1-3 seconds
- Script language build 0 seconds

Crash Recovery

- Recover state after crash - popular with users, and...
- Great debugging tool
 - zero time to reproduce problem after build
 - skips normal initialization code

Source Code



```
; <<< WIDTH=STRIPWIDTH(MAX) >>>
;
; Calculate width of strip
;
; On entry  MAX = window width
;           R5 = window pointer
;
; On exit WIDTH = width of strip
;
FUNC    STRIPWIDTH,4
CURRENTSTRIP R0                ; get pointer to strip
CLR     R1
LOOP
    MOVB  1(R0),R3              ; get width of next element
    UNTIL EQ
    ADD   R3,R1                ; add in width of this element
    SUB   #1,R1                ; elements overlap by 1 pixel
    ADD   #2,R0
NEXT
    ADD   #2,R1                ; include extra pixel for right edge
    FRESULT R1
ENDFUNC STRIPWIDTH
```

235 1 WD16 Assembler Western (Mac OS Roman) Classic Mac (CR) 20,219 / 3,...



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