

Direct Manipulation

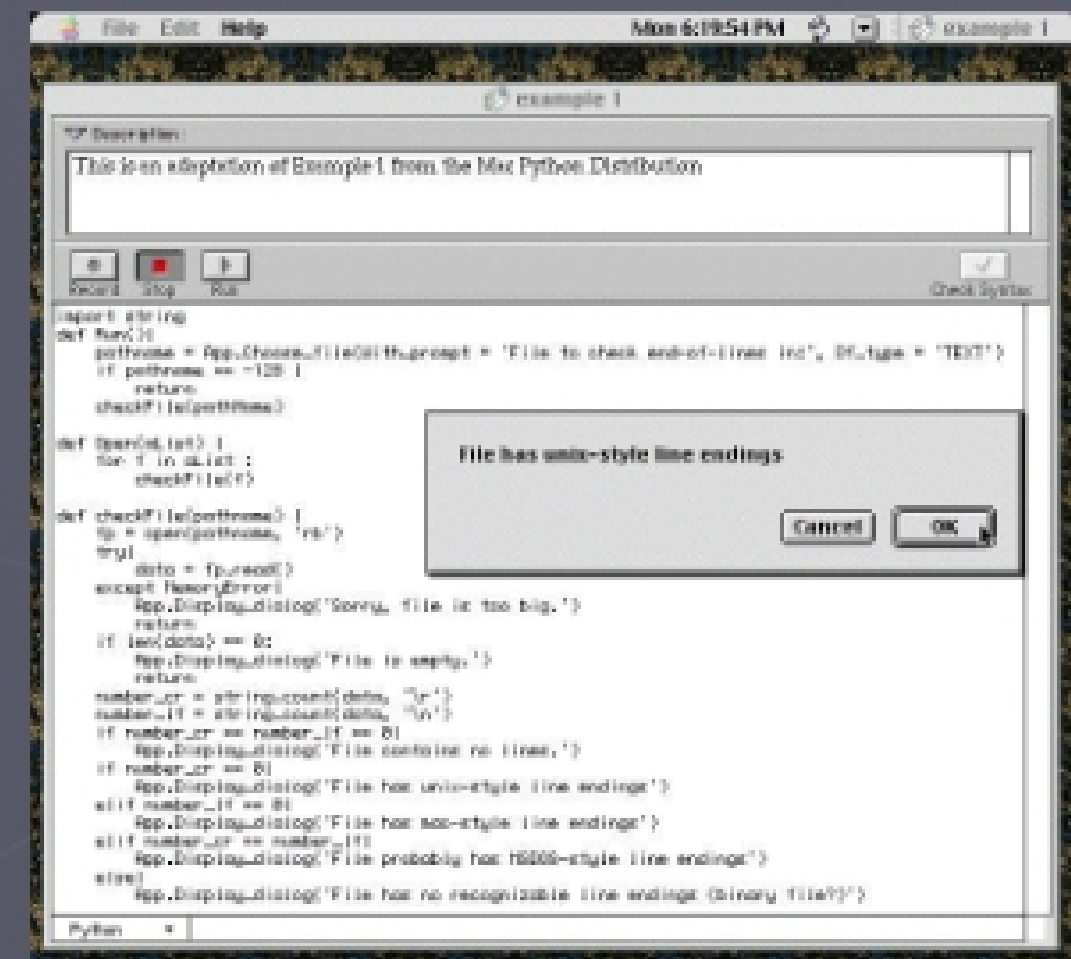
Human Computer Interaction

CIS 6930/4930

Section 4188/4186

Introduction

- ▶ Interactive systems can produce reactions that non-interactive systems are less likely to produce
- ▶ Truly pleased user! They report...
 - Master of the interface
 - Competency of task performance
 - Ease of learning new and advanced features
 - Confidence of retention
 - Enjoyment
 - Eagerness to show to novices
 - Desire to explore



The image shows a Microsoft Excel spreadsheet titled 'ont2003.xls'. The spreadsheet displays tax-related data with columns for various income categories and their corresponding amounts. A cell containing '0.00' is highlighted with a box and labeled 'from Schedule 4'.

Line	Description	Amount	Amount
12	Total Income		
13	Employment income (box 14 on all T4 slips)	101	30,665.00
14	Commissions included on line 101 (box 42 on all T4 slips)	102	.00
15	Other employment income	104	.00
16	Old Age Security pension (box 13 on the T4A (OAS) slip)	103	.00
17	CRR or ORR benefits (box 20 on the T4A(R) slip)	104	.00
18	Disability benefits included on line 114 (box 18 on the T4A(P) slip)	102	.00
19	Other pension or superannuation	106	.00
20	Employment insurance benefits (box 14 on the T4E slip)	109	.00
21	Taxable amount of dividends from taxable Canadian corporations (see the guide)	120	.00
22	Interest and other financial income (attach Schedule 4)	121	.00
23	Net partnership income, limited on non-active partners only (complete Schedule 4)	122	.00
24	Rental income	Gross 126	Net 126
25	Taxable capital gains (attach Schedule 3)	127	.00
26	Support payments received	Total 128	Taxable amount 128
27	RRSP income (from all RRSP slips)	129	.00
28	Other income	Specify 130	.00
29	Self-employment income (see lines 135 to 143 in the guide)		
30	Business income	Gross 135	Net 135
31	Professional income	Gross 136	Net 136
32	Commission income	Gross 138	Net 139
33	Farming income	Gross 139	Net 140
34	Fishing income	Gross 140	Net 140
35	Workers' compensation benefits (box 10 on the T5007 slip)	144	.00
36	Social insurance payments	145	.00
37	Net federal supplements (box 21 on the T4A(OAS) slip)	146	.00

Direct Manipulation Interfaces

- ▶ Interfaces that provide:
 - Visibility of objects of interact
 - Rapid, reversible actions
 - Instead of typed commands, graphic actions, such as pointing to the item of interest
- ▶ Ex. Drag a file to a trash can
- ▶ What reasons is this better than 'rm'?
- ▶ Other areas of direct manipulation?
 - Games
 - Scientific Viz
 - VR/AR (gestures, gloves, tracked devices)
 - 2D/3D what's the difference?

