CASE STUDIES ANSWERS

Collection Letter

<today_date>

Dear <title> <last_name>,

Our records indicate that you are past due <num_of_days>. If you do not pay within <pay_day>, then we will kindly repo your <color><style_ automobile>.

<greeting>.

Warm Regards,
<repo_man>

Example letter

December 18, 1999

Dear Mr. Harmon,

Our records indicate that you are past due 255 days. If you do not pay within 5 days from the date of this letter, then we will kindly repo your red Ford 150 Truck.

Please have a Merry Christmas and prosperous New Year.

Warm Regards
Rocky Balboa

Questions and other information

❖ The number of past due days (num of days) is date of letter minus the due date. Due date derived from the **Payment File**
❖ *Pay day* is calculated.
❖ **Repo Man** is read from the *Employee File*
❖ Title and Last Name are read from the *Customer File*
❖ The *greeting* is based upon the date of the letter and an appropriate message from the *Greeting File*.

What are the data elements? **8, today's date is counted because it is meaningful information.**
Is this letter an EO or an EQ, why? EO since pay day is calculated.
How many FTR's? **4 FTR's**

Control Inputs

Accounting

1. How many data elements are on the "Checking Preferences" control Screen?

   5 DET's one for each check box and the OK button.
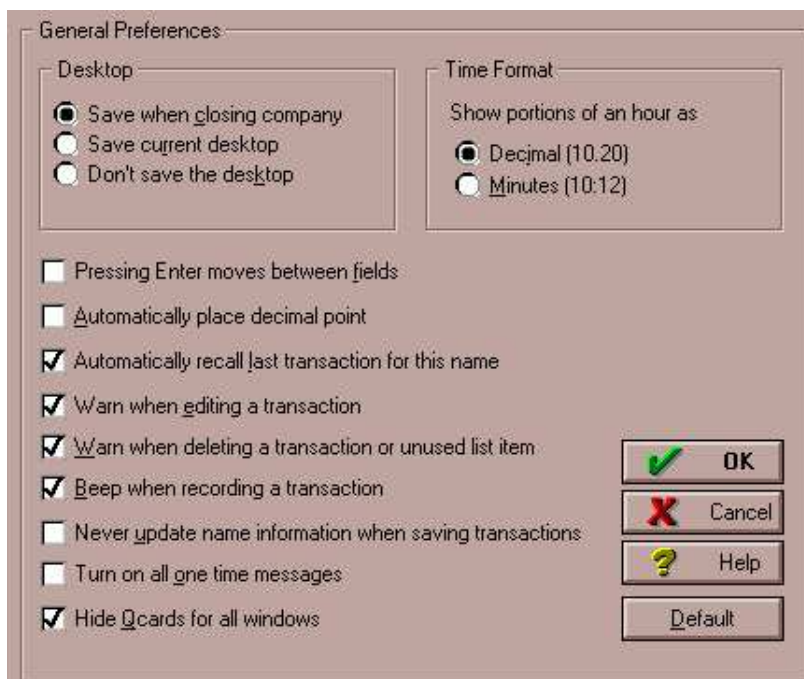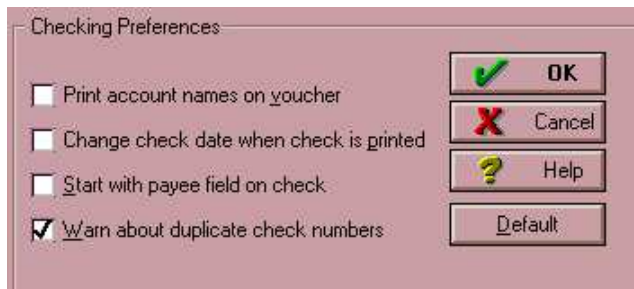
Checking

2. How many data elements are on the "General Preferences" control Screen?

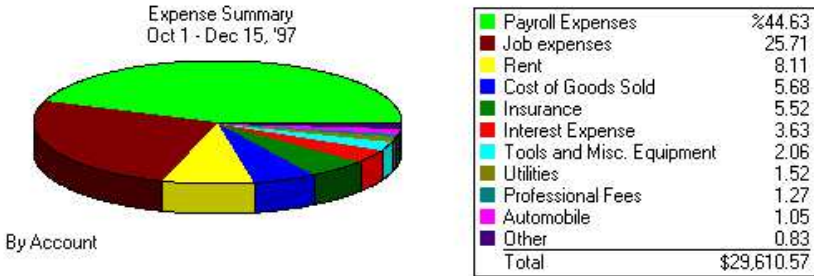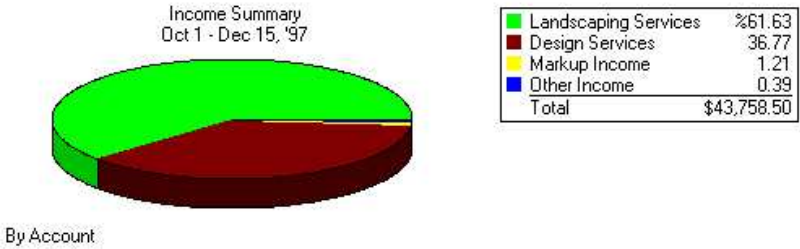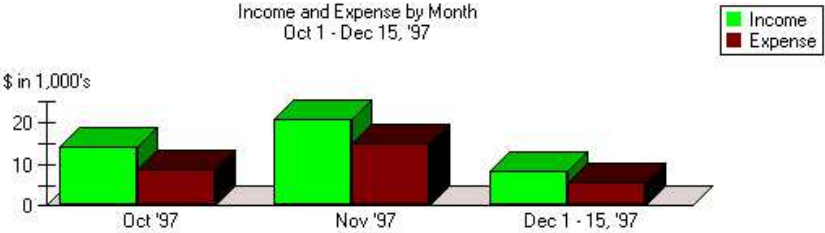   **12 total DET's, 9 check boxes, 2 radio buttons, and the OK**

Finance Charge

3. The how many control inputs are represented by the menu items to the right?

   Looks like it could be 4 control EI's, but need more information.

General

4. If the "default" reads values from a control file, then how is "default" treated? It would be treated as an EQ.

Iconbar

Menus

Checking Preferences

☐ Print account names on voucher

☐ Change check date when check is printed

☐ Start with payee field on check

☑ Warn about duplicate check numbers

✔ OK

✖ Cancel

? Help

Default

General Preferences

Desktop

◉ Save when closing company
○ Save current desktop
○ Don't save the desktop

Time Format

Show portions of an hour as

◉ Decimal (10.20)
○ Minutes (10:12)

☐ Pressing Enter moves between fields

☐ Automatically place decimal point

☑ Automatically recall last transaction for this name

☑ Warn when editing a transaction

☑ Warn when deleting a transaction or unused list item

☑ Beep when recording a transaction

☐ Never update name information when saving transactions

☐ Turn on all one time messages

☑ Hide Qcards for all windows

✔ OK

✖ Cancel

? Help

Default

Graphical Information

Income and Expense by Month
Oct 1 - Dec 15, '97

| | Income |
| | Expense |

$ in 1,000's

| Income Summary | |
Oct 1 - Dec 15, '97	
Landscaping Services	%61.63
Design Services	36.77
Markup Income	1.21
Other Income	0.39
Total	$43,758.50

By Account

| Expense Summary | |
Oct 1 - Dec 15, '97	
Payroll Expenses	%44.63
Job expenses	25.71
Rent	8.11
Cost of Goods Sold	5.68
Insurance	5.52
Interest Expense	3.63
Tools and Misc. Equipment	2.06
Utilities	1.52
Professional Fees	1.27
Automobile	1.05
Other	0.83
Total	$29,610.57

By Account

1. What are the external outputs?

   The three graphs (bar, and two pie)

2. What are the data elements for each EO?

   Date range, item, percentage and total.

3. How are the legends treated? **In this case the legends are part of the graphs.**

Graphs Part II

There are two data ILF's that contain information needed to produce the graph. There is an additional control file, which alters the way the graph looks.

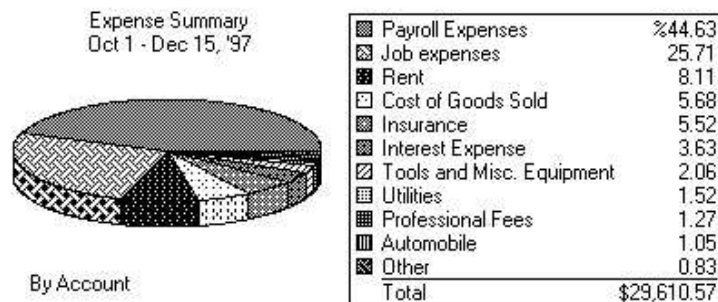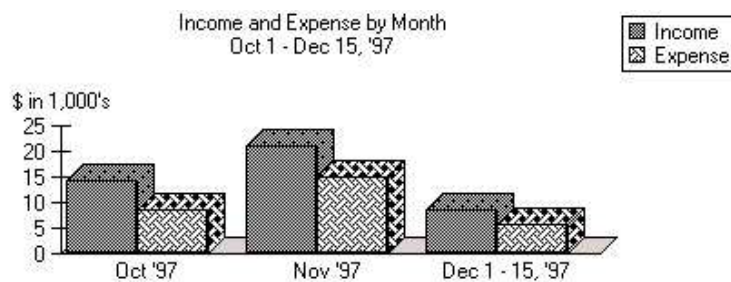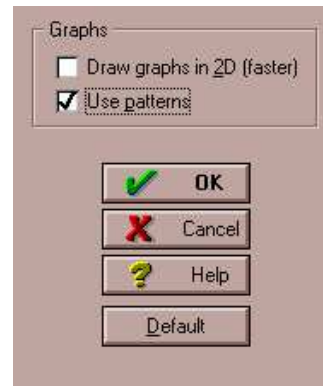1. Is there a control EI and control ILF for "graphs"?

   Yes… this will increase the number of FTR's

2. How many total FTR's are referenced for the graphs?

   3 Total, the two data and control

3. Does this graph represent another EO?

No, it is the same as before, but now there are more FTR's.

The Weather Application

Release 1.0

The following application was designed to capture temperature and rainfall by city and state. There is only one input screen, one file and one report. Each field on the following input screen can be modified (add, changed or deleted). The add and change functions are different. All previous entries viewed by using the scroll bar. Assume a VAF of 1.0.
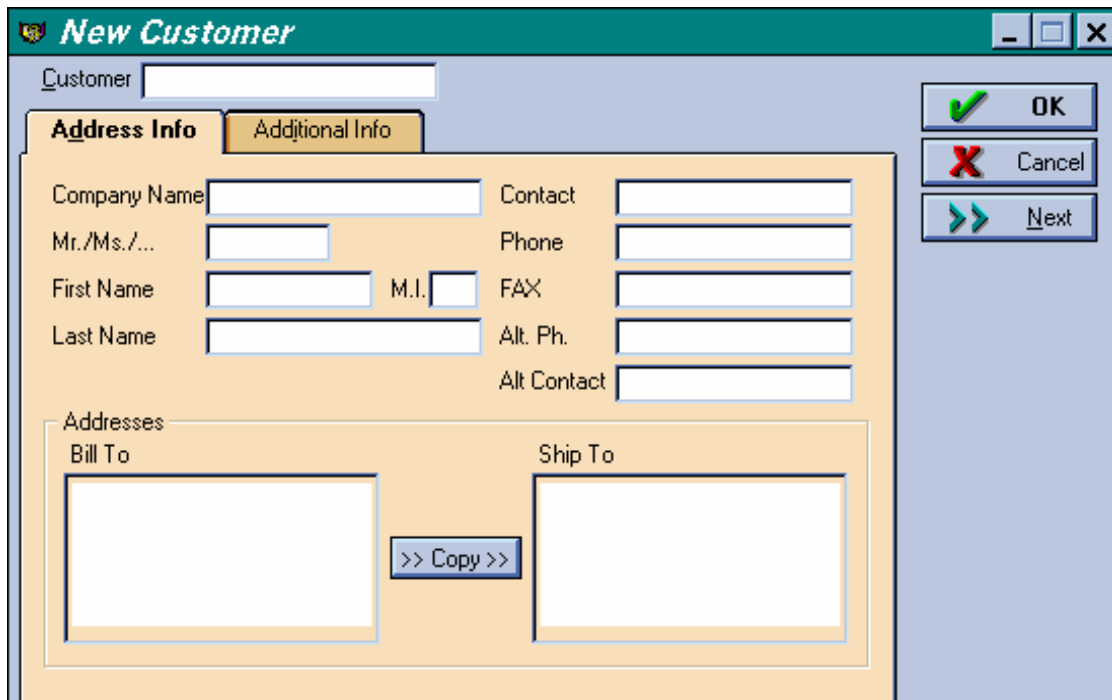
Weather Storage File				
City	State	Temperature	Rain Fall	Date

Average Temperature and Rain Fall by City and State				
		Temperature	Rain Fall	Date
City 1	State 1			
	Detail Readings for City 1			
	Averages			
City 2	State 2			
	Detail Readings for City2			
	Averages			

Based on the weather application fill in the following table. The exercise is designed to identify the exact number of data elements.

Component (EI,EXTERNAL OUTPUT, EQ, ILF and EIF)	Number of Data Elements?	What are the data elements?

What is the total unadjusted number of function points?

Explanation of Problem

Each EI has 6 data elements (the input field) and the action key. The EQ has 6 data elements also (the fields and the action key). The scroll button represents only one DET.

The ILF has only 5 DET's

The report has 7 data elements – do not forget average temperature and average rain fall (by the way there is no average date).

All the components are low.

Adding A New Customer

The following two screens are used to add a new customer to an application. The customer is not considered added until both Address information and Additional Information is completed.

The OK and Next buttons both save information to the file.

Figure 1

There are four drop down list boxes on the Additional Info tab (Type, Terms, Rep and Tax Item). The first three (Type, Terms and Rep) are read from files that are maintained by the application. Tax item is hard coded. Please ignore the "Define Fields" button.

Figure 2

The drop down lists Type, Rep and Terms are displayed at the end of this case study.

For this part of the application please answer the following questions.

1. How many external inputs are there?

Only one

2. How many total data elements are there on the external input?
23 (if I counted right), do not forget the customer is taxable field! And the action key.

3. What are the data elements?
   The fields that data can be input and the action key.
4. In terms of function points what are Type, Terms and Rep?

The are external inquiries

5. In terms of function points how are Type and Terms treated the second time they appear?
    The Rep and Terms drop down box are used again when invoices are created.

They are not counted as EQ's, but they would be treated as DET's for the EI's.

Enhanced Weather Application

Release 2.0

Release 2.0 is an enhancement to "The Weather Application" Release 1.0. The user wants the ability to save temperature as either Celsius or Fahrenheit. To accomplish this a radio button is added to the input screen, which allows the user to select either Celsius or Fahrenheit. An additional field is added to the file, and an additional field is added to the reports.   Assume that the value adjustment factor increases to 1.14.

How many "enhancement" function points does this represent?

What is the baseline function point of release 2.0?

Every item in the application changed. There was a new field on all the EI's, a new field on the EQ, EO and ILF.   Hence, the enhancement is the same size as the original baseline.

In the first version there was 3 Low EI's, one Low EQ, one Low EO and one Low ILF (9 + 3 + 4 + 7) or 26 unadjusted function points.

Just multiply 26 x 1.14, which is 29.6 (or 30) adjusted function points.

BikeWare
Release 1.0

BikeWare is a software product designed for competitive bike riders.   BikeWare captures and stores a variety of information.   BikeWare is for a single rider only. The rider wants to be able to change, add or delete information about a ride or rider. The following information is either entered by the rider or calculated. All **bold** items are stored. The following information is grouped logically into two major groups (ride and rider):

Ride Information
> **Average Speed**
> **Bike Chill Factor**
>> T = Temperature during the Ride
>> W = Average Speed
>> X = .303439 * sqr (W) - .0202886 * W
>> Bikechill = Int (91.9 - (91.4 - T) * (X + .474266))
>
> **Cadence**
> **Calories Burned** = Exponential $^{((.092037 * Average Speed) - 4.26)) * (Duration of Ride) * Weight of Rider)}$
>
> **Date of the Ride**
> **Distance of the Ride**
> **Duration of Ride**
> **Temperature during the Ride**

Rider Information
> **Age** (age of rider in years)
> **Weight** (weight of rider)
> **Sex** (sex either male or female)

Graphs

Four separate graphs (see below) can be created by days, by weeks or by months for each item below. A different set of calculations will be used depending of the graph is days, weeks or a months graph.   Each graph is available on line or as a hard copy and processing logic is different.
> **Distance of Ride**
> **Average Speed**
> **Duration of Ride**
> **Calories Burned**

For BikeWare determine the following information:

Identify the external inputs, how many data elements and how many files will be referenced?

Item	DETs	FTR's	Rating	Value
EI Ride Add	**8**	**2**	**Ave**	**4**
EI Ride Change	**8**	**2**	**Ave**	**4**
EI Ride Add	**8**	**1**	**Low**	**3**

Item	DETs	FTR's	Rating	Value
EI Rider Add	**1**	**1**	**Low**	**3**
EI Rider Change	**1**	**1**	**Low**	**3**
EI Rider Add	**1**	**1**	**Low**	**3**

How many files type referenced are there for the add, the change and the delete? Is it always the same?

There are two FTR's because the EI needs the other FTR to make a calculation. The second FTR does not need to be referenced to make a deletion.

How many internal logical files are there and what are the data elements?

There are two ILF's. There are 8 in the ride ILF and 3 in the rider ILF. Only those values that are saved are counted as DET's.

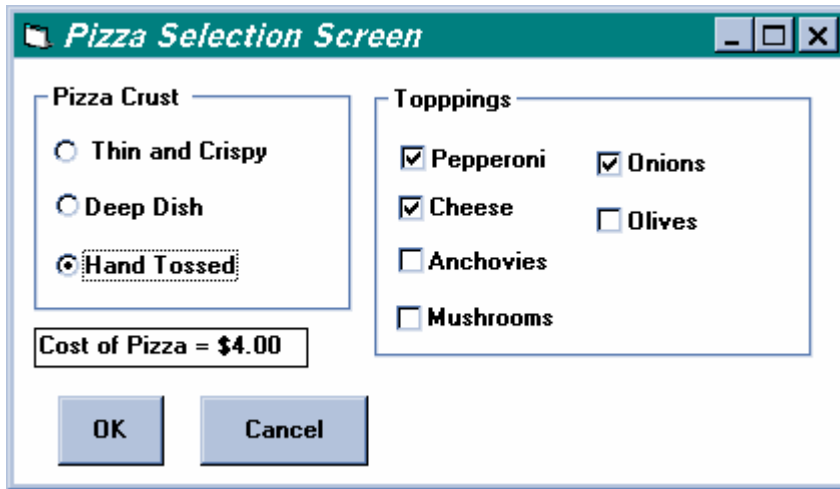How many external outputs? Describe the external outputs also?

There are 24 EO's.

	Days	Weeks	Months	Totals
Distance of Ride	1	1	1	3
Average Speed	1	1	1	3
Duration of Ride	1	1	1	3
Calories Burned	1	1	1	3
Total	4	4	4	12

Since there is online and hardcopy and processing logic is different there are 12 x 2 or 24 total EO's

How many data elements for each external output? **Just two ….**

Pizza Screen Design

Option 1

Toppings are read from another application (kitchen application). If the topping is not available it is not displayed.

The cost of the Pizza is calculated automatically.

Figure 3

When the OK button is clicked the Toppings, Pizza Crust Type and Cost of Pizza are saved.

Option 2
The Items in the drop down box are hard code – not read from a file.
Available Toppings are read from another application (kitchen application).
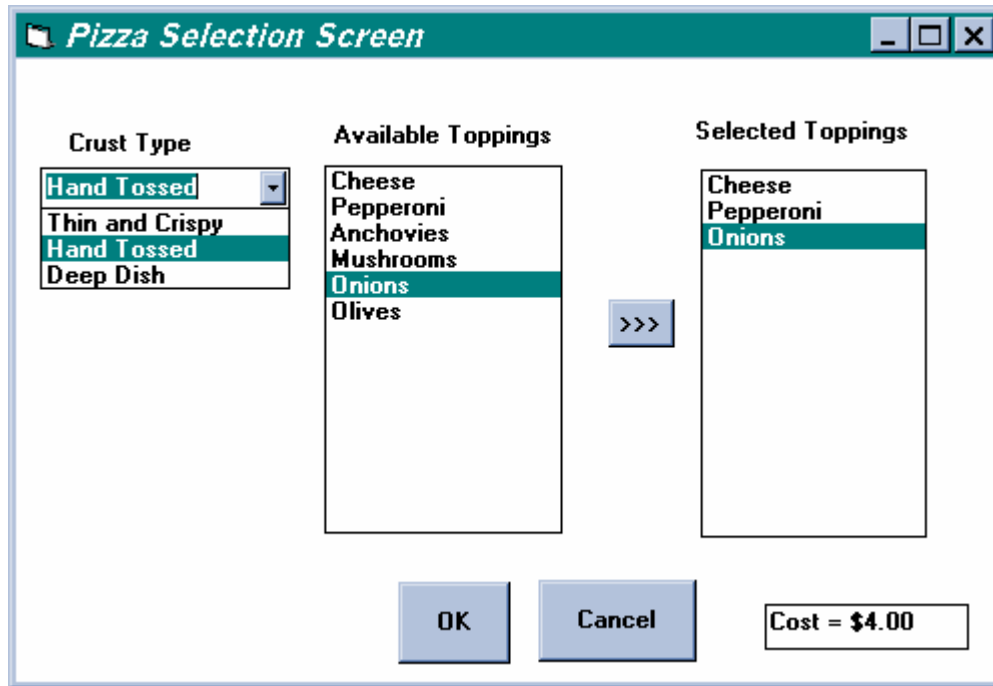When a Topping is selected from Available Toppings it is copied to Selected Toppings

Longstreet Consulting Inc.
www.SoftwareMetrics.Com

Figure 4

The Cost of the Pizza is automatically calculated.
When the OK button is clicked the Selected Toppings, Pizza Crust Type and Cost of Pizza are the saved.

What are the differences if any between Option 1 and Option 2? Please fill in the table below.

Option 1		Option 2	
Component	**Data Elements**	**Component**	**Data Elements**
Toppings (EQ)	**1 and very recursive**	**Same**	
EIF (from kitchen app)	**1 perhaps more but it is still a low**	**Same**	
EI Add	**4 DET's**	**Same**	

Problem Explained.
The number of components and DETs are exactly the same in both options. An EI can have derived data.

www.PIZZACLUB.COM

Part 1

WWW.PizzaClub allows customers to order pizza via the Internet. The following is only one screen of many screens.

1. Once the customer has accessed www.PizzaClub.Com they fill out this screen.
2. When the customer clicks on the form the information is saved to a file.
3. If any of the fields are not filled out (populated) the customer receives and error message telling them "All fields must be populated".
4. What are the data elements? **The fields, the error message and action key (9)**
5. How many unadjusted function points does this screen and one file represent. **10 (low EI and assumed low ILF.**

Figure 5

Part 2

Www.PizzaClub.com is going to be enhanced.   Instead of allowing the customer to type city and state, they will input the zip code number. The application will search the zip code file and then automatically populate City and State. The customer can override the populated fields. The zip code file is maintained by another application.

How many unadjusted function points does this enhancement represent?

What are the new components?

What data elements are impacted?

In the example there are two new components an EQ and an EIF. There is no impact to the existing application. The process of saving information to a file which we counted before remains exactly the same. There is now an transaction that proceeds the EI that we count. And this new EQ transaction uses one EIF.

It is important to note that the user can intervene prior to the EI. That means the EQ transaction stopped. If there was no user intervention. The EI would have two FTR's and the query transaction would be part of the EI and not a separate transaction.

Control Information

What are the data elements in the following control screen (alignment)?
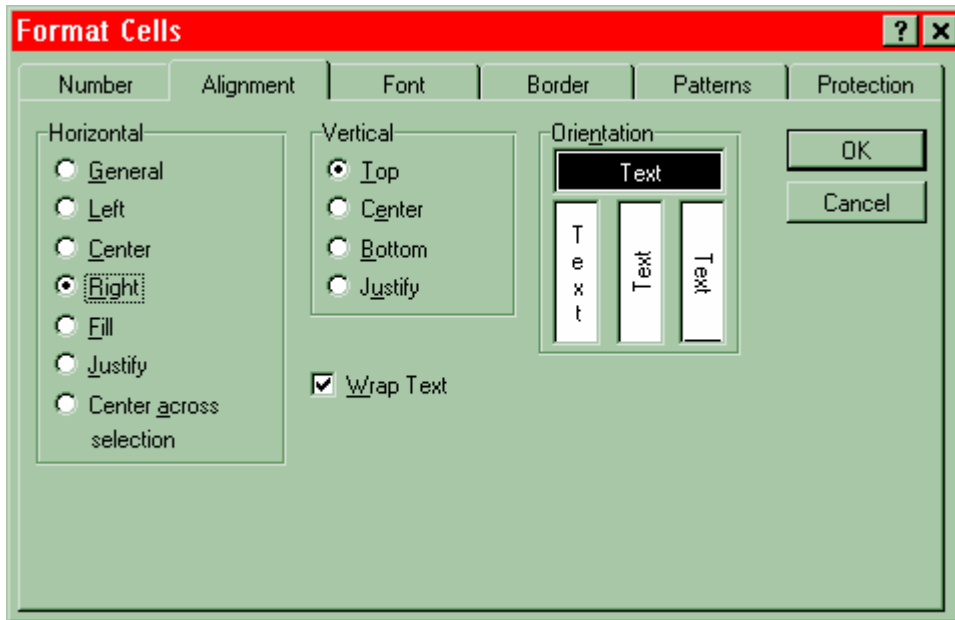
5 data elements

Figure 6 - Control Screen

How many data elements are there in the following "Data Entry Preferences" control screen? **9   6 DET's for the check boxes + 2 different radio buttons selections + 1 for the action key.**

If this control screen updates one internal logical file, then how many unadjusted function points does this represent? **10 (one low EI and one low ILF --- 3 plus 7)**
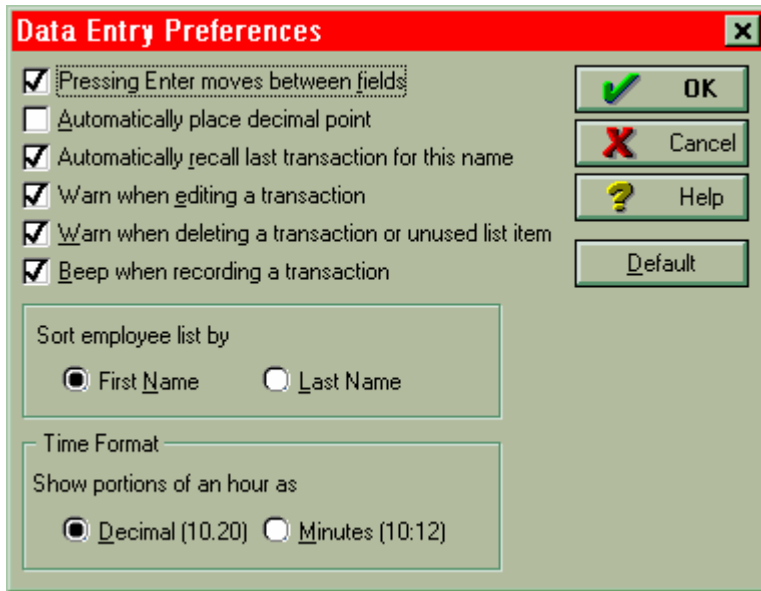

Figure 7