Appendix A

Primitive data types

There are a number of integer number (whole number) data types available in Delphi which can be used depending on the minimum and maximum values you want to store in a variable. These numbers are used when we intend to only do integer calculations with a variable, e.g. the number of items that you purchased or a rugby team's score.

This is a summary of the details of these numbers:

Data type	Number of bytes it occupies in memory	Range
Byte	1 byte	0 to 255
ShortInt	1 byte	-127 to 127
Word	2 bytes	0 to 65,535
SmallInt	2 bytes	-32,768 to 32,767
LongWord	4 bytes	0 to 4,294,967,295
Cardinal	4 bytes	0 to 4,294,967,295
LongInt	4 bytes	-2,147,483,648 to 2,147,483,647
Integer	4 bytes	-2,147,483,648 to 2,147,483,647
Int64	8 bytes	-9,223,372,036,854,775,808 to 9,223,372,036,854,775,807

Examples	Example code

510
1000000
-305
The Left, Top, Width and Height properties of all components.
	var
	iCount, iAnswer: integer;
	iIndex: byte;
	
	iCount := StrToInt(edtCount.Text);
	iCount := sedCount.Value;
	lblResult.Caption := IntToStr(iAnswer);

No spaces or commas are allowed in an integer value in Delphi.

Numbers with decimal places are used when working with values such as monetary values, distances and weights.

This is a summary of the details of these numbers:

Data type	Number of bytes it occupies in memory	Range
Single	4 bytes	1.5×10^{-45} to $3.4 \times 10^{+38}$
Real	8 bytes	5.0×10^{-324} to 1.7×10^{308}
Double		
Currency	8 bytes	-922337203685477.5808 to 922337203685477.5807
Extended	(32-bit platforms)	
	10 bytes	3.4×10^{-4932} to $1.1 \times 10^{+4932}$
Extended	(64-bit platforms)	
	8 bytes	5.0×10^{-324} to $1.7 \times 10^{+308}$

Examples	Example code

2.5
0.14
-29345.56784
	var
	rAmount: currency;
	rTotal: real;
	
	rAmount := StrToFloat(edtAmount.text);
	lblResult.Caption := FloatToStr(rAmount);

Char (Occupies 1 byte in memory)		
Examples	**Range**	**Example code**

'M' ; '*' ; '?' ; 'ë' ; '9'	Any character in the ASCII table.	var
		cGender, cClass: char;
		
		cGender := edtGender.Text[1];
		lblOut.Caption := cClass;
		Since a char data type can only contain one character, and a Text property is of type string, you need to indicate to Delphi that only the first character of the Text property should be copied to the variable.

- A letter, number, punctuation mark or any other character from the ASCII table, e.g. the class or gender of a pupil.
- Must be a single character (written between single quotes).

String (Can occupy various numbers of bytes in memory depending on the way it was declared. It always uses one extra byte for a number indicating the length – the number of characters in the string.)		
Examples	**Range**	**Example code**
'Mary' 'The birds' 'CTX473 NW'	Any combination of characters.	var sName20 : string[20]; This string can contain 20 characters. sAddress: string; Unlimited number of characters. Delphi allocates memory to the string as needed. sName: ShortString; This string can contain 255 characters.
		sName := edtName.Text; lblOut.Caption := sAddress;

- In Delphi string values are written in single quotes. The smallest possible string contains 0 characters and is called an empty string. An empty string is indicated by two single quotes with no space in between ('').
- It is preferred to indicate the maximum number of bytes needed for a string in square brackets, e.g. String[20] as this will reserve only the number of bytes indicated in brackets + 1, in this case 21 bytes will be reserved in memory.

Boolean (Occupies 1 byte in memory.)		
Examples	**Range**	**Example code**
True False	True False	var bFound: boolean;

		btnDisplay.Enabled := False;
		imgDog.Visible := True;
		bFound := True;

- Often we want to indicate Yes or No, for example if a learner is going on a field trip or not. A Boolean variable can contain one of only two values, namely TRUE (-1) or FALSE (0).
- The 'value' of a Boolean variable can be displayed, for example:
  ShowMessage(BoolToStr(bFound));
  If bFound is True, the value *-1* will be displayed. If bFound is False, the value *0* will be displayed.
- Not used in input and output statements.
- No quotes are used.