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Visual Basic - Basic

Module 5 - Data Types in Visual Basic

Visual Basic classifies information into two major data types, the numeric data types, and the non-numeric data type



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Numeric Data Types



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In Visual Basic, numeric data types are types of data comprises numbers that can be calculated using various standard arithmetic operators. Examples of numeric data types are examination marks, height, body weight, the number of students in a class, share values, the price of goods, monthly bills, fees, bus fares and more.



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Numeric data that involve round figures are classified as Integer or Long integer. Data that require high precision calculation are classified as single and double precision data types, they are also called floating point numbers.



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Numeric data that involve money are classified as currency data types. Lastly, data that require more precision and involve many decimal points are classified as decimal data types. These data types are summarized in Table below:

Numeric Data Types		
Type	Storage	Range of Values
Byte	1 byte	0 to 255
Integer	2 bytes	-32,768 to 32,767
Long	4 bytes	-2,147,483,648 to 2,147,483,648
Single	4 bytes	-3.402823E+38 to -1.401298E-45 for negative values 1.401298E-45 to 3.402823E+38 for positive values.
Double	8 bytes	-1.79769313486232e+308 to -4.94065645841247E-324 for negative values 4.94065645841247E-324 to 1.79769313486232e+308 for positive values.
Currency	8 bytes	-922,337,203,685,477.5808 to 922,337,203,685,477.5807
Decimal	12 bytes	+/- 79,228,162,514,264,337,593,543,950,335 if no decimal is use +/- 7.9228162514264337593543950335 (28 decimal places).



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Non-numeric Data Types

In Visual Basic, non-numeric data types are data that cannot be calculated using standard arithmetic operators.

The non-numeric data comprises text or string data types, the Date data types, the Boolean data types that store only two values (true or false), Object data type and Variant data type. They are summarized in Table below:

Non-numeric Data Types		
Type	Storage	Range
String(fixed length)	Length of string	1 to 65,400 characters
String(variable length)	Length + 10 bytes	0 to 2 billion characters
Date	8 bytes	January 1, 100 to December 31, 9999
Boolean	2 bytes	True or False
Object	4 bytes	Any embedded object
Variant(numeric)	16 bytes	Any value as large as Double
Variant(text)	Length+22 bytes	Same as variable-length string

Suffixes for Literals

Literals are values that you assign to data. In some cases, we need to add a suffix behind a literal so that Visual Basic can handle the calculations more accurately.

For example, we can use num=1.3089! for a single precision data type, num=1.3089# for a double precision data type, num=130890& to indicate long integer data type and num=1.3089@ to indicate currency data type. The suffixes are summarized in Table below.

Table	
Suffix	Data Type
&	Long
!	Single
#	Double
@	Currency

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Assignment

Ques 1: Calculate and Display Monthly Expenses

Question: Write a Visual Basic program that calculates and displays the total monthly expenses for a household. Use appropriate data types for the following inputs:

- Rent (Decimal)
- Utilities (Decimal)
- Groceries (Decimal)
- Miscellaneous (Decimal)
- Number of family members (Integer)

Instructions:

1. Create a Windows Forms application.
2. Add TextBox controls for each of the inputs: Rent, Utilities, Groceries, Miscellaneous, and Number of family members.
3. Add a Button to calculate the total monthly expenses.
4. Add a Label or TextBox to display the total monthly expenses.
5. Write the event handler for the button to calculate the total expenses by summing up Rent, Utilities, Groceries, and Miscellaneous. Also, divide the total expenses by the number of family members to find the per-person expense.
6. Display the total and per-person expenses.

Ques 2. Store and Display Book Information

Question: Write a Visual Basic program that stores and displays information about a book. Use appropriate data types for the following attributes:

- Title (String)
- Author (String)
- ISBN (String)
- Price (Decimal)
- Published Year (Integer)
- Number of Pages (Short)

Instructions:

1. Create a Windows Forms application.
2. Add TextBox controls for each of the inputs: Title, Author, ISBN, Price, Published Year, and Number of Pages.
3. Add a Button to store the book information.
4. Add a ListBox to display the stored book information.
5. Write the event handler for the button to create a formatted string containing all the book information and add it to the ListBox.

3. Calculate Body Mass Index (BMI)

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Question: Write a Visual Basic program that calculates and displays the Body Mass Index (BMI) of a person. Use appropriate data types for the following inputs:

- Height in meters (Single)
- Weight in kilograms (Single)

Instructions:

1. Create a Windows Forms application.
2. Add TextBox controls for the inputs: Height and Weight.
3. Add a Button to calculate the BMI.
4. Add a Label or TextBox to display the calculated BMI.
5. Write the event handler for the button to calculate the BMI using the formula:
 $BMI = \text{Weight} / (\text{Height} * \text{Height})$.
6. Display the calculated BMI.

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