Data Validation in Excel

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MS Excel is the most popular spreadsheet software with a wide range of features, formulas, and functions. Data Validation is one of the essential features in MS Excel. When creating an Excel sheet for users or customers, we may often need to restrict the inputs based on different criteria to ensure that all the entries or inputs are correct and consistent. Data Validation is the solution that helps us control user inputs into specific cells or a range according to the specified rules.

In this article, we discuss the feature Data Validation in Excel and the method to insert/ apply it within the Excel sheet. The article also explains relevant examples with images to help us understand the concepts of Data Validation clearly.
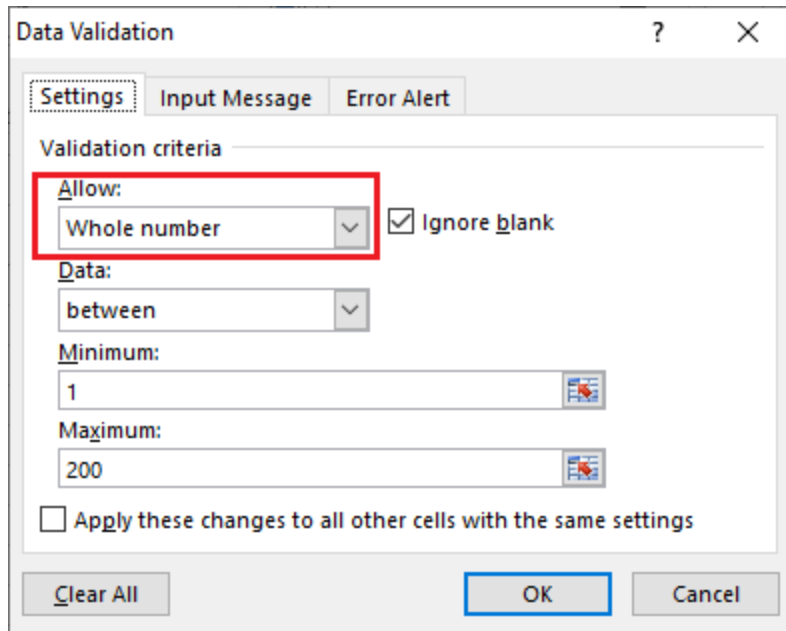
What is Data Validation?

Data Validation is an essential Excel feature that helps control or restricts user inputs/ entries in selected cells. It enables users to set the desired validation rules to control what type of data they can enter into the corresponding cells in an Excel sheet. For instance, we can restrict users to enter values between 1 to 10, enter names or passwords in less than 30 characters, enter or choose an entry from the predefined list of acceptable values, and more.

Some of the essential tasks (restrictions/ validations) that we can set using the Data Validation are as follows:

- Allow users to put **numeric** or **text** entries only
- Allow entering numbers less than, more than and between a specified **range**
- Allow data inputs of a specific **length**
- Restrict entries to predefined values in a **drop-down list**
- Restrict date and time entries outside or within a specific **range**
- Validate a specific entry based on **another cell**
- Display an **input message** informing users what the corresponding cell accepts when the user selects a cell
- Display a **warning or error message** when the user enters wrong data
- Locate **incorrect or wrong entries** in the validated cells

How does Data Validation work in Excel?

Applying Data Validation on any cell or range of cells in an Excel sheet restricts the users from entering any undesired entries in corresponding cells based on the validation rules. For instance, if we set validation to accept only numbers or numeric values, other users or we will not be able to enter any values other than numbers.

Data Validation can be configured to show an input message to users when the respective cell is selected, informing them what is allowed in it, as shown below:
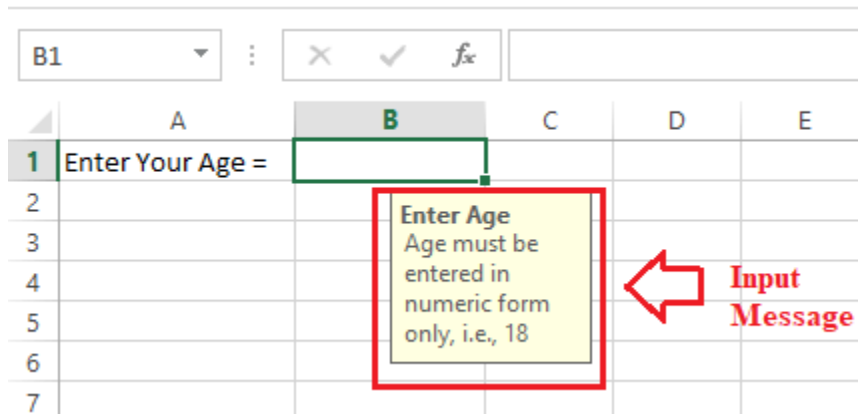

As soon as we try to enter any other type of data in restricted cells, Excel instantly displays an error message and even can display which type of data the respective cells can accept. The error message can be of different styles and customized or created manually while setting up the validation rules on the Excel sheet.
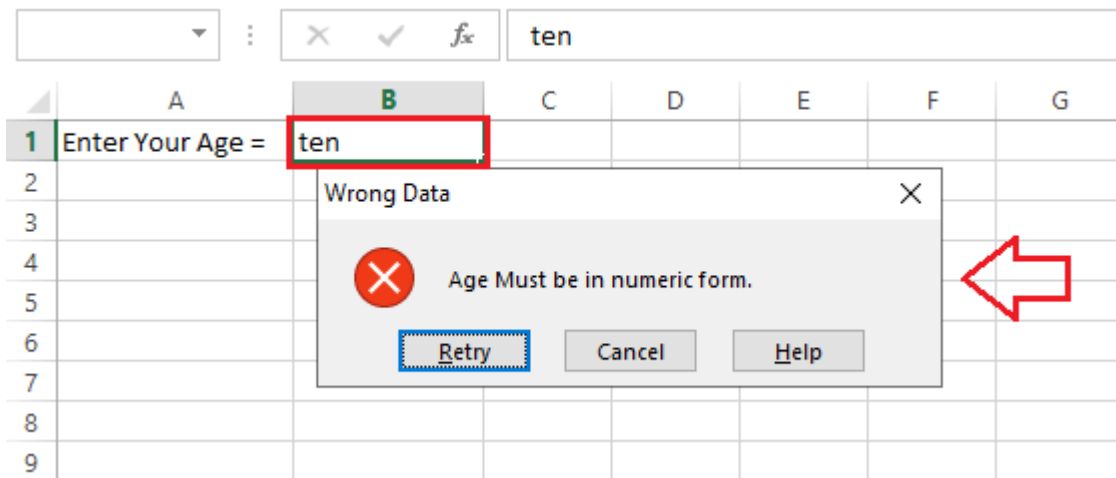
Data Validation Controls

The Data Validation feature or its controls can be found on the ribbon under the Data tab. By default, it is placed under the category 'Data Tools'.
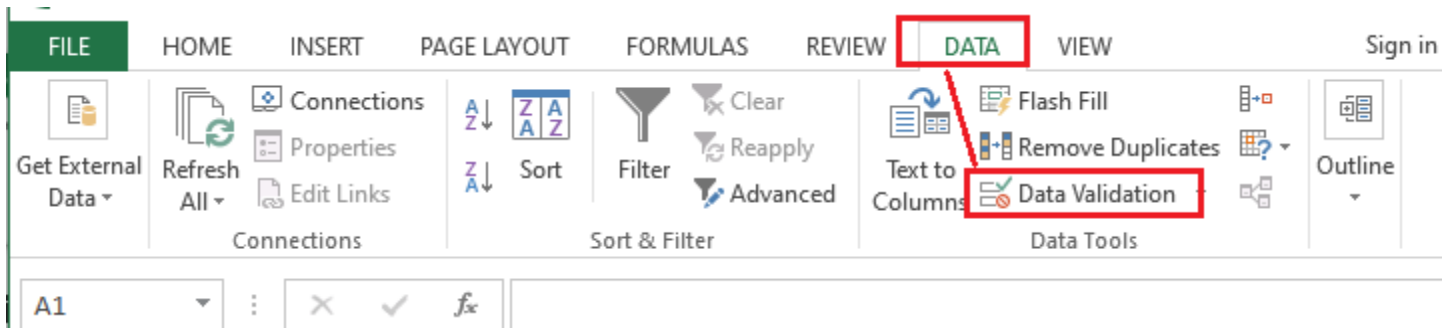

As soon we click the 'Data Validation' icon from the ribbon, it immediately launched a **Data Validation dialogue box**.

In addition to the Data Validation shortcut on the ribbon, we can also use the keyboard shortcut '**Alt + D + L**' without quotes. It will launch the Data Validation dialogue box instantly.

Using Data Validation Dialog Box to Define Validation Rules

The Data Validation dialogue box contains three essential options/ tabs: **Settings, Input Message**, and **Error Alert**.
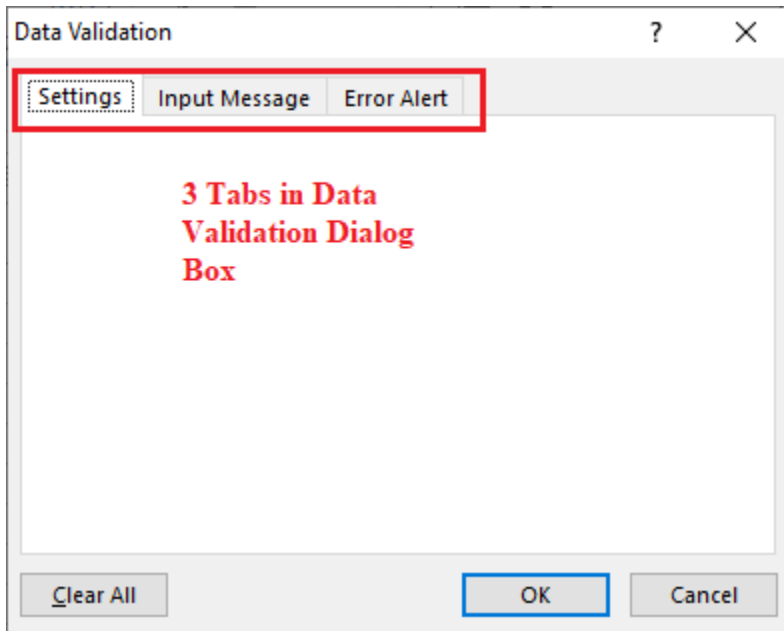
Let us understand each tab in detail:

Settings Tab

The settings tab provides us options to set validation criteria. The tab helps us choose the desired validation rules from the built-in options we want to allow in selected cells. Moreover, we can also set custom rules with the customized formula to validate user inputs. The settings tab contains all the **data validation options** present in Excel.
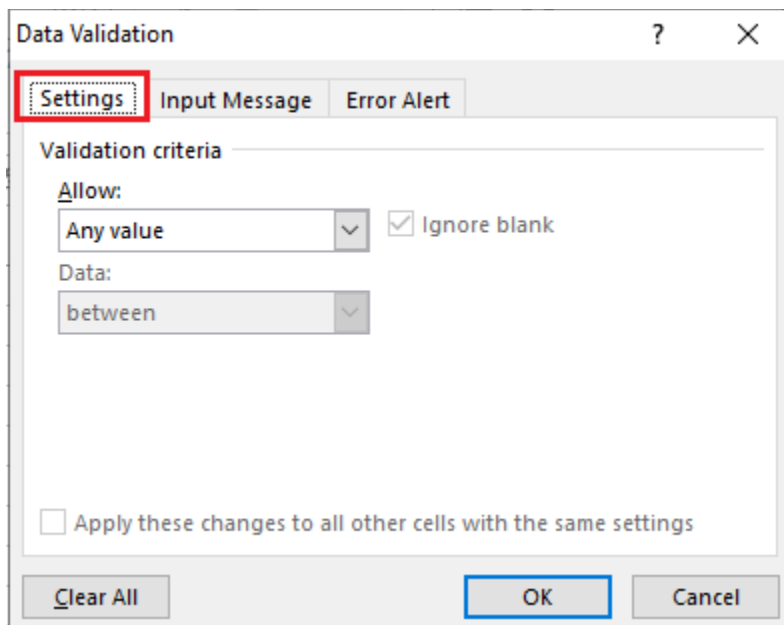

Input Message Tab

The input message tab has a text box to enter a message displayed as soon as the respective cell is selected. The input message is an optional feature of Data Validation. If we do not define any message as an input

message, excel does not show any message when the user selects the respective cell with data validation. It does not affect the working of the data validation and has no effect or control over what the user enters into a cell. However, it can be helpful to inform users about the allowed or expected data values.
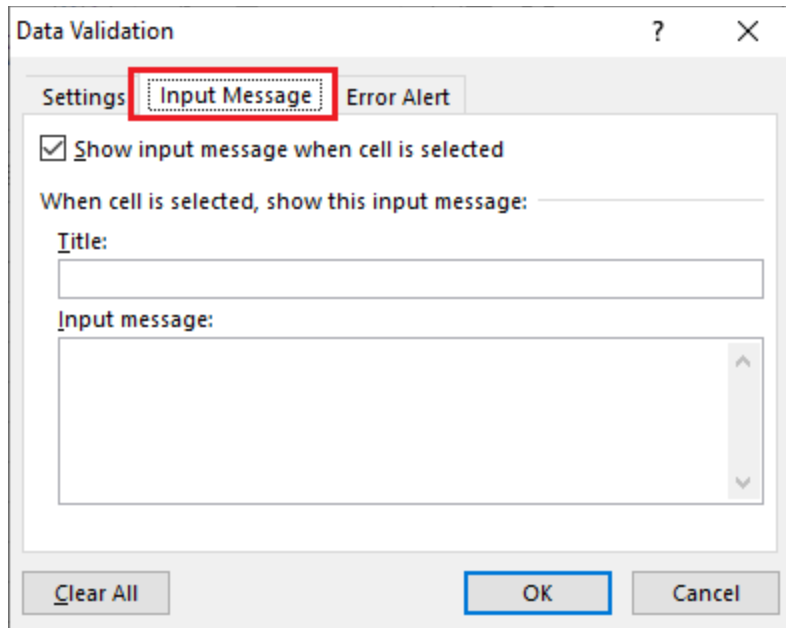

Error Alert Tab

The error alert tab provides us options to control the way how the validation is enforced. We can set criteria and then use any desired error style to accept or reject the user inputs accordingly. Additionally, we can also display a message to the user informing what the error is or what values must be entered in corresponding cells.
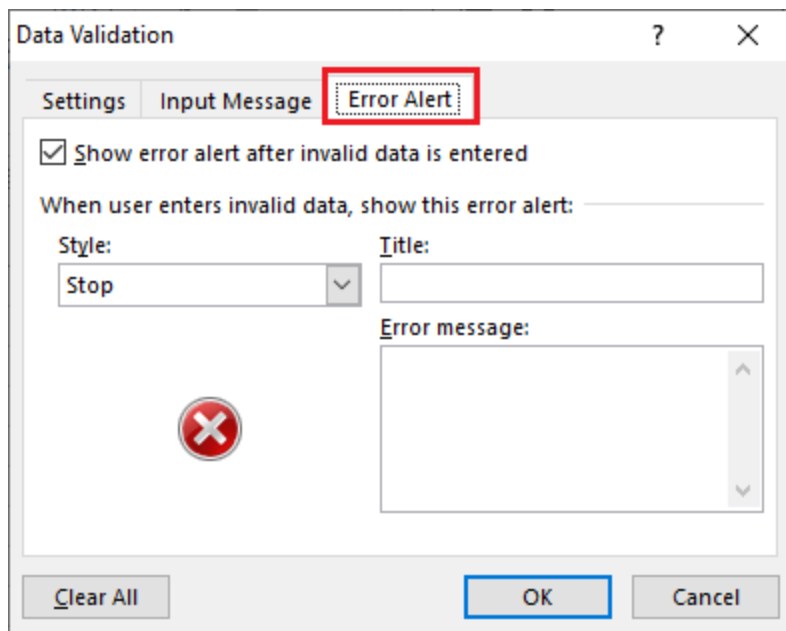

There are currently three types of error styles in MS Excel, as listed below:

o **Stop**: When the error style is set to 'Stop', Excel prevents users from entering invalid data in respective cells. If a user enters invalid data, it triggers a pop-up window with a specified message, and the input is rejected. The Stop alert window displays two options: **Retry** (to edit invalid data) and **Cancel** (to remove the invalid data). Although the Stop Alert window displays options to retry, users must enter the correct value, which passes validation when retrying.
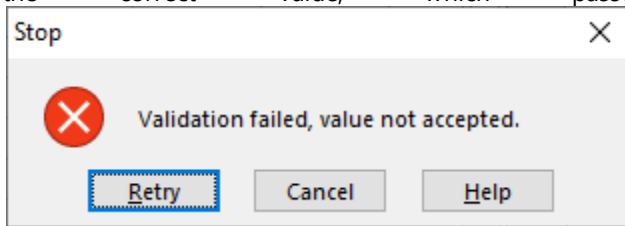
o **Warning**: When the error style is set to 'Warning', Excel warns users that the entered value is invalid. It also displays a different icon and the specified message. However, it does not prevent users from entering invalid values; users can ignore the warning message and register a value that does not even pass the validation. The Warning alert window displays three options: **Yes** (to accept invalid data), **No** (to edit invalid data) and **Cancel** (to remove the invalid data).
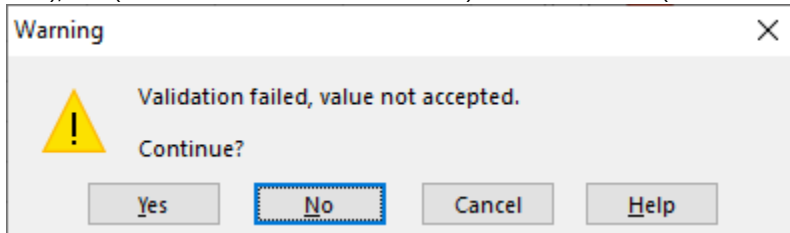

o **Information**: When the error style is set to 'Information', Excel informs users that the entered data is invalid. It displays a different icon and a specified message. Like the Warning error style, the Information error style also does nothing to prevent invalid data. Users can ignore the information message and register invalid data without passing the validation. The Information alert window displays two options: **OK** (to accept invalid data) and **Cancel** (to remove the invalid data).
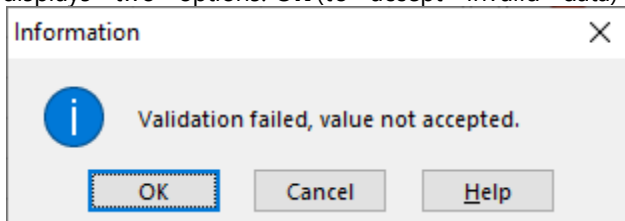
Data Validation Options

When creating a data validation rule from the settings tab, we have eight options to validate user inputs. They are as follows:
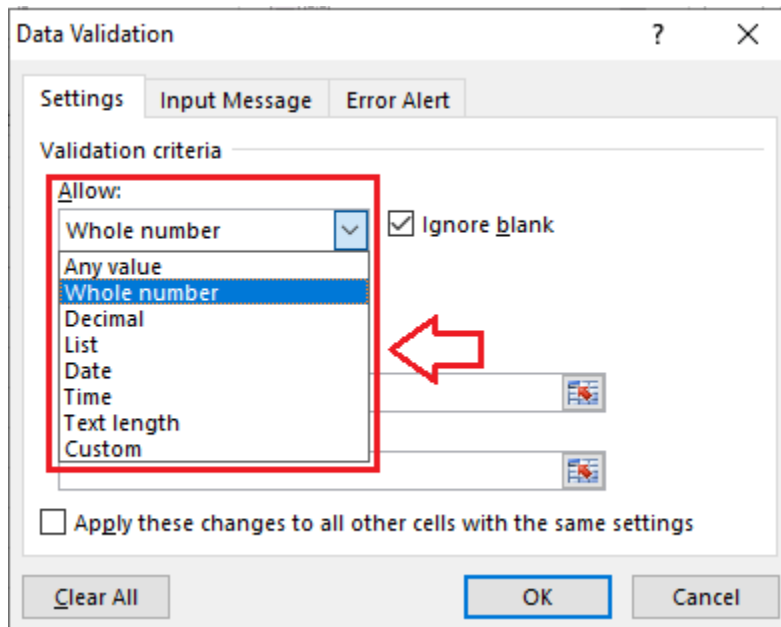
- o **Any Value**: It removes restrictions and allows every value in selected cells, making no validation at all. However, data validation in selected cells earlier with an input message displays the message while selecting the respective cells. Therefore, we must edit/ remove the input message when selecting the option 'Any Value'.

- o **Whole Number**: It restricts users to enter only the whole numbers. Once we select the' Whole Number' option, we get more options relevant to limiting user inputs. The other options typically include less than, more than, equal to, between, etc. For instance, we can restrict users to enter whole numbers between 1 to 100 in restricted cells.

- o **Decimal**: It is almost identical to the option 'Whole Number'. However, it allows users to enter values in decimal forms. For instance, if we restrict users to enter decimal values between 0 to 5, the respective cells can accept values like 2.3, 0.5, 0.9, 4.1, etc.

- o **List**: It is a typical type of validation. It restricts users to select values from a predefined list. Specifically, the predefined values are displayed to the user in the form of a drop-down menu. We can define values directly into the Settings tab or supply them as a range on the sheet. For instance, we can restrict users to select a Gender from a list having values like Male, Female and Others.

- o **Date**: It restricts users to enter values in the dates form. However, we can set some validation rules to allow previous dates, futures dates, dates between the specific range, etc. For instance, we can restrict cells to accept only the future dates in the appointment row/column.

- o **Time**: It is almost identical to the option 'Date'. However, it restricts users to enter times. We can set validations to allow time before, after a specific time, or between specific time ranges. For instance, we can restrict cells to accept time between 8:00 AM and 7:00 PM.

- o **Text Length**: It restricts users to enter values of the specific length. This typically means that the inputs are validated according to the number of characters or digits. For instance, if we restrict users to enter values with length 4 in the desired cells, the specified cells can only accept values with four characters or digits, such as JTP1, 0101, ABCD, etc.

- o **Custom**: It is an advanced option in data validation. This option can be used to set validation rules based on the custom formula. Specifically, we can enter the custom formula to validate user inputs. The use of formulas greatly extends the possibilities for the data validation rules. For instance, we can

use a custom formula to ensure that the entered value is uppercase or lowercase, check whether values include the characters 'abc', allow the weekdays only, and more.

Apart from the validation options, the settings tab also displays two checkboxes:

- o **Ignore Blank**: If this option is marked, it instructs Excel not to validate empty/ blank cells. In technical terms, this option mainly affects the command 'circle invalid data'. When selected as marked, the cells with no values are not circled even if they fail to pass validation.
- o **Apply these changes to all other cells with the same settings**: If this option is marked, Excel updates the applied validation to all the other cells when there is a match of the original validation of cell/cells being edited.
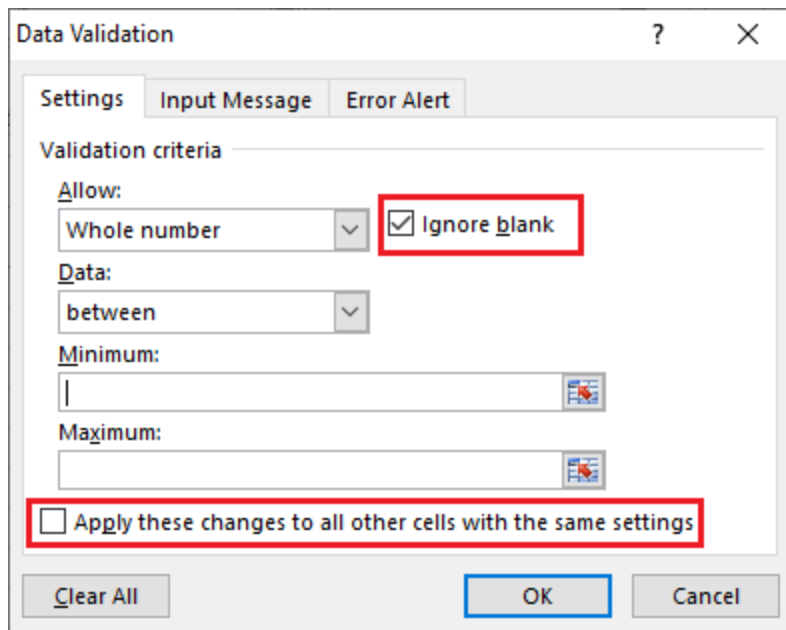

How to add Data Validation in Excel?

To add a data validation in an Excel sheet, we must perform the following steps:

Step 1: Launch the Data Validation dialogue Box

First, we must select all the cells or a range to which we wish to apply validation. Next, we need to navigate the **Data tab - Data Tools** group and select '**Data Validation**' to launch the data validation dialogue box.
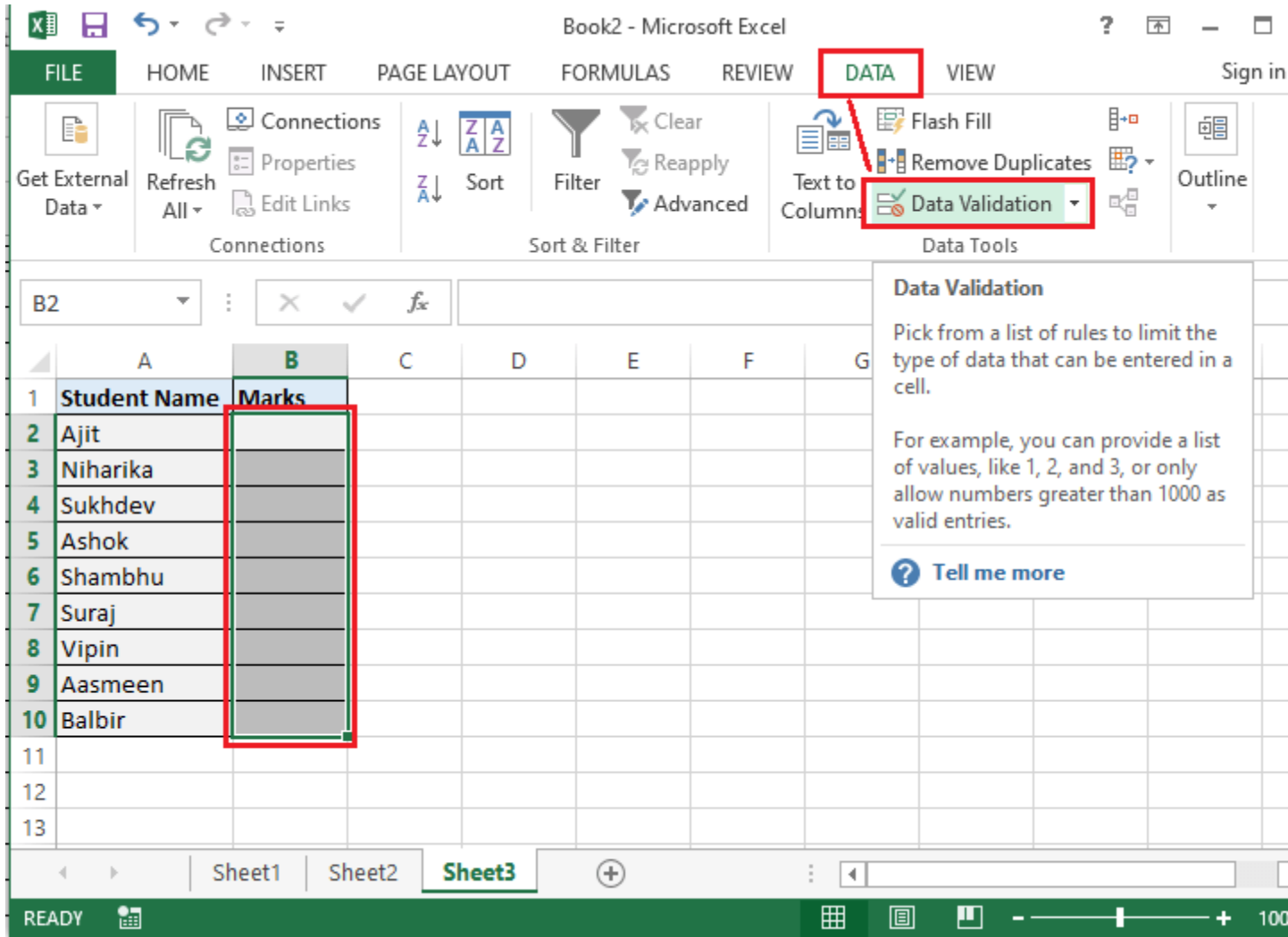
Step 2: Set the Data Validation Rule

After the data validation dialogue box is displayed, we need to go to the Settings tab to define validation criteria. We can provide the desired values, cell references, or formulas in the validation criteria.

Suppose we need to restrict users to enter marks for each student, but the marks must be supplied in between 0 to 100. This way, we can eliminate the chances of wrong inputs to some extent. For this, we need to set the criteria in the Settings tab as the following image:

After all the validation settings have been set, we need to click the OK button to close the validation dialogue box or move to the next tab to insert an input message and/or error alerts. The other two tabs are optional and used to inform users to enter appropriate values according to the validation rules.

Step 3: Create an Input Message to Display (Optional)

If we want to display a message to the user saying which type of data is supported or allowed in the selected cell, we can use the input message tab. Using the input message, we can inform the user regarding the allowed data type format when the user selects a corresponding cell/ cells.

For example, we can display the following message into the desired fields (cell/cells/range).
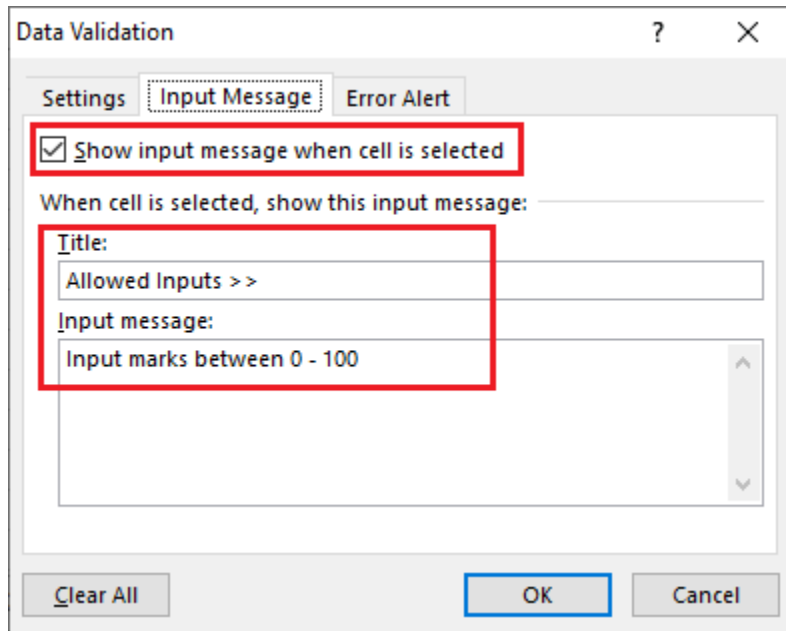
Once the input message is entered, we can click the OK button or move to the Error Alert tab further.

After setting up an input message, the corresponding cell (s) displays the message like this:


Step 4: Add an Error alert (Optional)

In addition to an input message, we can also set an error alert to display when the user enters invalid data into the respective cells. Moreover, we can also add a custom error message.
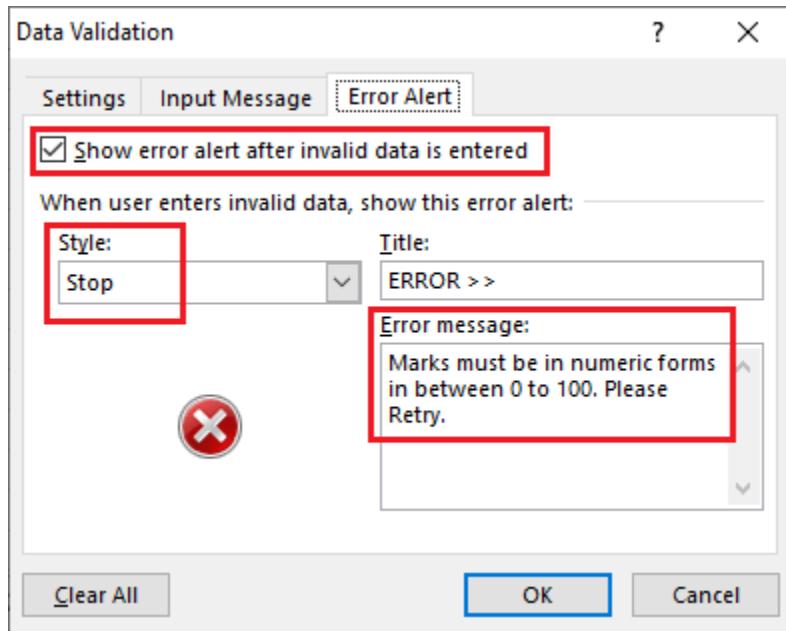
In the above image, we used the option '**Stop**' as an error alert style. We can use the other two styles, Warning and Information, accordingly. Lastly, we must click the **OK** button.

When the user enters invalid data, it triggers an error window with a message, and the invalid input is not allowed.
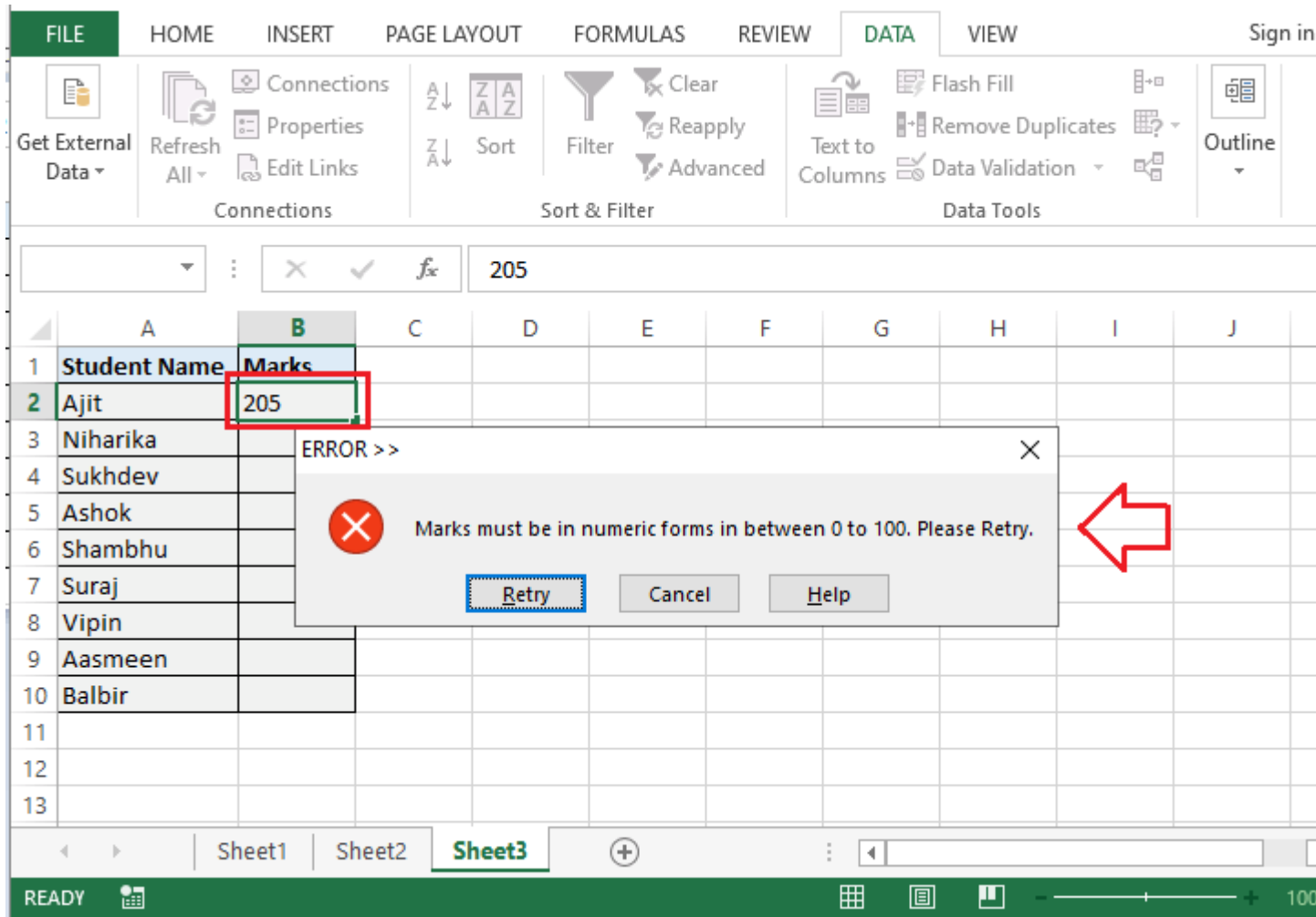
If we don't set a custom error alert and set the validation rules ins Excel cell(s), Excel automatically displays the default error alert with the predefined error message. It looks like this:
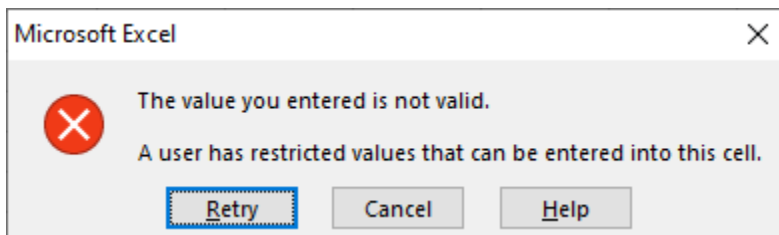
How to copy Validation Rules to other cells?

Suppose we have some cells with validation rules, and we want to apply the same validation rules on other cells. To do this, we can use Paste Special feature, as listed below:

- o   Select and copy the cells with validation using the shortcut **Ctrl + C**.
- o   Use the shortcut **Ctrl + Alt + V + N** to paste the copied cells onto the cells we wish to apply data validation. Alternately, we can launch the **paste special dialogue box** using the right-click menu options and select the '**Validation**' option.
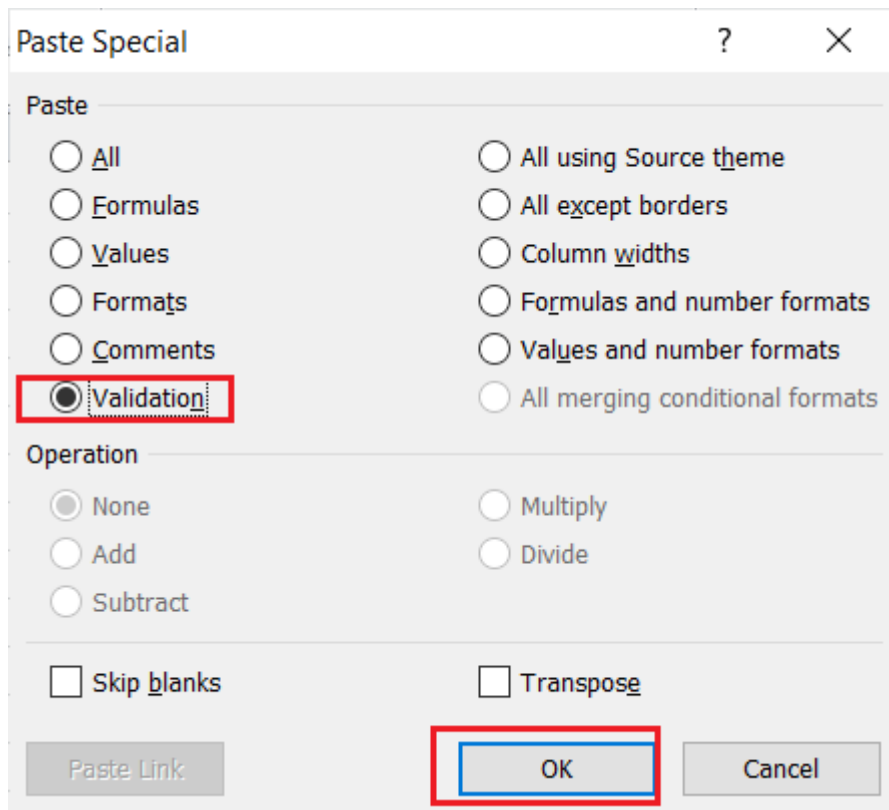
This will apply the same validation on other cells on which the contents are copied.

How to remove or clear Data Validation?

There are two common methods used to remove or clear all the validation in Excel:

Method 1: Clear Data Validation using the Data Validation Dialog Box

- o **Select all the cells** to remove data validation.
- o Launch the **Data Validation dialogue box** from the ribbon.
- o Click the option '**Clear All**' under the Settings tab and the **OK**
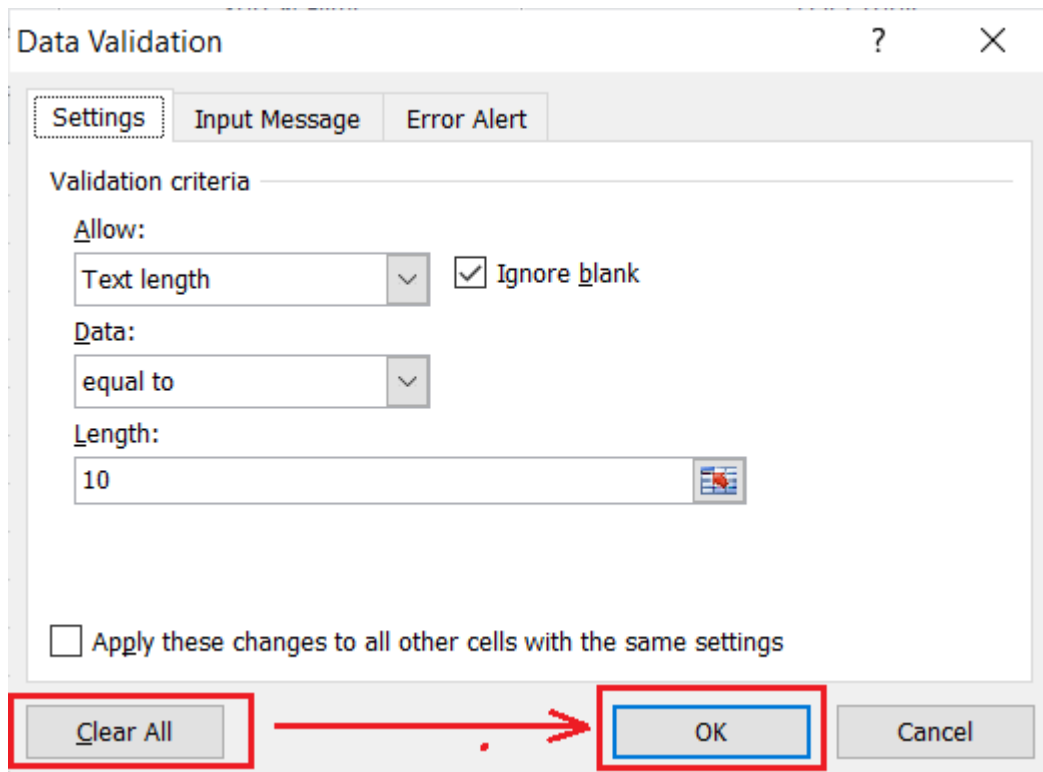
This will remove/ clear data validation from the selected cell(s).

Method 2: Clear Data Validation using Paste Special Feature

o   Select empty cells without validation rules, and copy using the shortcut **Ctrl +C**.

o   Select cell(s) with the validation from which the data validation is to be removed.

o   Paste the contents using **Ctrl + V** and hit **Enter**

Create a Validation Rule

1. Select the cells you want to validate.
2. Click the **Data** tab.
3. Click the **Data Validation** button.
4. Click the **Allow** list arrow.
5. Select the type of data you want to allow.

- **Any value:** No validation criteria applied.
- **Whole number:** Allows a whole number between the minimum and maximum limits set.
- **Decimal:** Allows a decimal or a percent entered as a decimal between the set limits.
- **List:** Allows a value from a list of choices. A list arrow appears in the cell, and users can choose from the list.
- **Date:** Allows a date within set limits.
- **Time:** Allows a time within set limits.
- **Text length:** Allows text containing a certain number of characters.
- **Custom:** Allows a formula to be entered to calculate what is allowed in the cell.

6. Specify the data validation rules.
   The validation options will vary depending on the option selected in the Allow field.
7. Click **OK**.

Add Input and Error Messages

Prevent data validation issues by setting up Excel to display a message whenever a cell or range of cells is selected. These messages are useful when other people will be entering data in your worksheet. An error message can be configured to appear when data is entered that does not match a data validation rule.

1. Select the cells where you want an input message to appear.
2. Click the **Data** tab.
3. Click the **Data Validation** button.
4. Click the **Input Message** tab.
5. Enter an input message.
6. Click the **Error Alert** tab.
7. Select an error alert style.
8. Enter an error alert message.
9. Click **OK**.
10. Select a cell with an input message.

Reference

https://www.javatpoint.com/data-validation-in-excel