

ERROR REPORTING

Most programs have errors which have to be detected and removed by testing. There could be errors in the spelling of command words, or errors generated when the program is run, or the program could run but give the wrong results.

There are three types of errors found in programs.

These are

- Syntax
- Execution
- Logic errors

Syntax Errors

These errors occur when you break the rules of the programming language. These errors occur during **implementation** when the code is being written.

Syntax errors can take the form of misspelt command words, missing brackets, misplaced commas and so on.

Example

Misspelt command words:	IMPUT, LOOPP, REPEET,
Missing brackets:	MsgBox("Must be a number between 1 and 100"
Missing inverted commas:	LET password="letmein

Execution Errors

Execution errors are detected during the **translation** of the program. The code needs to be running before these errors are reported.

Example

Using a variable that has not been declared, or dividing by zero which is mathematically impossible. Calling a sub-routine that has not been written. Trying to store a string value in an integer.

Logic Errors

This type of error causes the program to produce incorrect results, but does not stop the program from running. It is caused by an error in the **design** of the program, perhaps due to the wrong calculation being used or wrong logical operator.

Logic errors are trickier to spot as they **do not** produce error messages.

Example

Wrong Calculation:	LET volume = length + breadth + height
Wrong logical operator:	<, >, AND, OR, NOT, >=, etc

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- 1) Name three types of errors.
- 2) Identify the type of error for each example below.
 - a) $\text{Age} = \text{inputox}(\text{"Please enter your age"})$
 - b) $\text{Area} = \text{length} - \text{breadth}$
 - c) $\text{Average} = \text{total} / 0$
- 3) State the stage of the software development process that the following types of errors occur.
 - a) Syntax
 - b) Execution
 - c) Logic
- 4) The design below shows a selection of code to decide whether you are entitled to a school bus pass if you are between the age of 5 and 18.

```
1 IF age>5 OR age<18 THEN
2     SEND ["Eligible for school Bus Pass"] TO DISPLAY
3 ELSE
4     SEND ["Not eligible for school Bus Pass"] TO DISPLAY
5 END IF
```

- a) Name the design notation used above.
 - b) What would be the result if the user entered age 5?
 - c) Identify the error in the code.
 - d) What type of error has the programmer made?
 - e) Which stage in the software development process are these errors made?
 - f) Re-write the line of code so that the design is correct.
- 5) Examine the visual basic code below.

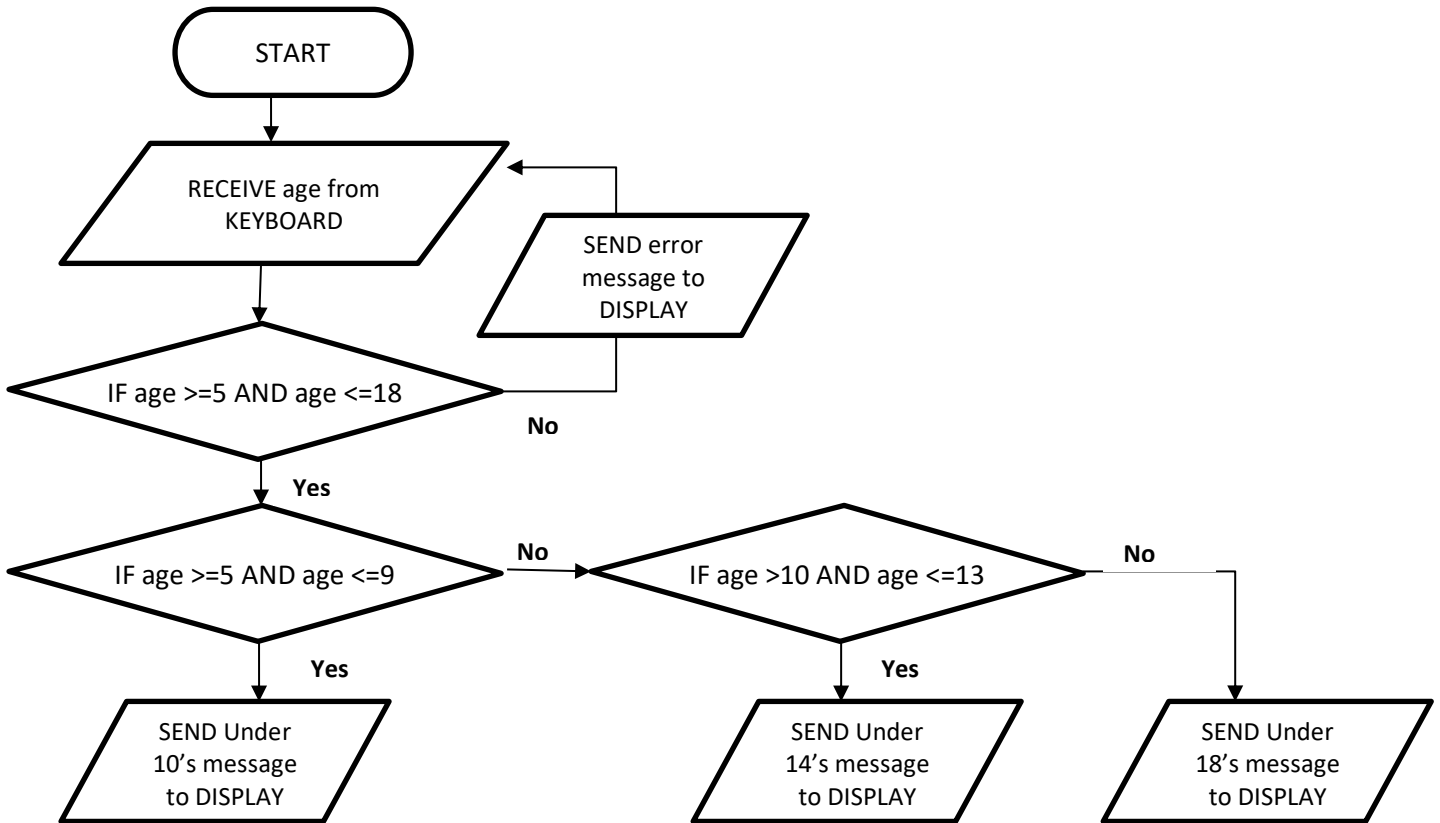
```
1 Public Class frmarea
2
3     Private Sub btnarea_Click(sender As System.Object, e As System.EventArgs) Handles btnstart.Click
4         Dim length As Integer
5         Dim breadth As Integer
6         Dim area As Integer
7
8         length = InputBox("Please enter length")
9         breadth = InputBox("Please enter length")
10
11         area = length * breadth
12         MsgBox(area)
13
14     End Sub
15 End Class
```

- a) Identify two errors in the code.
- b) Which type of errors are these?
- c) What stage in the software development process do these errors occur?

6) A program has been created to allocated pupils to the correct sports team.

Age	Team
5 – 9	Under 10's
10 – 13	Under 14's
14 – 17	Under 18's

The design for the program is shown below.



- Name the design notation used.
- State the output if the user entered the following ages.
 - 7
 - 10
- Identify the error in the code.
- Name the type of error that has been made.
- Show how this error should be fixed so that the program produced the correct results.

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- 7) A program is required that will apply the car brakes if the distance between the two cars is less than 15 metres (m). For safety reasons, the brakes should only be activated if the speed of the car is less than 30 mph. The brakes should be kept on until the speed of the car is 0 mph.

The design for the code is shown below.

```
RECEIVE speed_of_car FROM (real) SENSOR
RECEIVE distance_to_car FROM (real) SENSOR
IF speed_of_car <30 OR distance_to_car <15 THEN
REPEAT
    SEND apply brakes TO car brakes;
    RECEIVE speed_of_car FROM (real) SENSOR
UNTIL speed_of_car = 100
END IF
```

- a) Identify the two errors in the program design.
- b) When the program is translated the following error message is displayed

Error: Unexpected use of “;” at line 5

Name the type of error that has occurred. Justify your answer.

- 8) The following program is written in Visual Basic. When the program is run it produces the error message “length is not declared”.

```
1 Dim width As Integer
2 Dim area As Integer
3 length = InputBox("Enter length")
4 txtlength.Text = length
5 width = InputBox("Enter width")
6 txtwidth.Text = width
7 area = length + width
8 MsgBox("The area is " & area)
```

- a) What type of error has the programmer made in this situation?
- b) State what the programmer should do to fix this error
- c) Identify the line of code that contains a logic error
- d) Describe how this error could be fixed

- 9) A program is designed that awards pupils for attendance. The program should notify the teacher at the end of the month any pupils who have had full attendance and no late-coming.

```
IF absence = 0 OR latecoming = 0 THEN
    award = yes
ELSE
    award = no
END IF
```

- Identify the error in the design.
- Which type of error has the programmer made?
- Re-write the pseudocode to correct the error.
- When the program is run, the following error message is produced.
 - Name this type of error.
 - Which stage in the software development process does this error occur?

