KNOWLEDGE ORGANISER :: DEFENSIVE DESIGN # 1

Defensive Design is used to make sure programs function properly
If a program is functioning properly it should never break and never produce an error
In practice this is difficult to achieve
Programs try to protect their code from bugs and errors by using **Defensive Design**

DEFENSIVE DESIGN METHODS

- Anticipate how users might misuse the program and build in methods to prevent this from happening
- Ensure the code is well maintained
- Reduce the number of errors in the code using testing

INPUT SANATISATION

The easiest way for a user to misuse a program is by accidentally or intentionally enter incorrect data
Input Sanitisation means removing unwanted characters before data is passed into the program

INPUT VALIDATION

Input Validation means checking if data meets a certain criteria before it is passed into the program

Range Check	Checks to see if the data is within a specific range
Presence Check	Checks if any data has been entered
Check Digit	Checks to see if numeric data has been entered accurately
Format Check	Checks if the data is in the correct format (DD/MM/YYYY)
Look-Up	Checks the data against a list of allowed values
Length Check	Checks to see if the data contains the correct number of characters

MODEL ANSWER

Karen is designing a program that she can use to create a database of file names
She has written the following function to check an inputted file name
The removeChar(x) method returns a string with the character in position x removed

```
function formatName(file)
    int x = 0
    while x < file.length
        switch file[x]
            case "("
                file = file.removeChar(x)
            case ")"
                file = file.removeChar(x)
            case default
                x = x + 1
        end switch
    end while
    return file
end function
```

Explain what the function formatName() does

The function goes through each character in a string and removes (and). It then returns the amended string

Is the function formatName() an example of input sanitisation or input validation?

Input sanitisation

Give two validation checks Karen could use to check if the file name has been entered and that the length is less than 10

Presence check and length check