VBA: Tutorial Week 4

- A3 requirements & tips for success
- Non-linear, non-sequential programming using loops
- Nesting: branches and loops
- Collaboration vs. misconduct

Official resource for MS-Office products: https://support.office.com

First Tutorial (Monday or Tuesday): A3

CPSC 203: A3

- This is your first 'real' program writing assignment so you should not under estimate the time and effort required by typical students.
- Here's some "tips for success" that are given to students who are first learning how to write programs (exert from CPSC 217 and CPSC 231)
  - Practice things yourself
  - Make sure that you keep up with the material
    - Study concepts as soon as possible after class
    - If you fall behind more than 1 or 2 weeks without studying then you may not be able to catch up! ☹
  - Start working on things early

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A3: Feature #1

- Prompt the user for a word to find in a document(s).
- If Feature #6 is implemented the same word will be 'found' by the program in each document opened by your program.

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A3: Feature #2

- Count the number of instances of the word (from Feature #1) using the appropriate parts of the ActiveDocument object.
- Not case sensitive.
- Partial matches are counted.

A3: Feature #3

- Display the count of the instances via a MsgBox in the following form. "Number occurrences: <*actual number of occurrences of the search word*>"
  - e.g. Number occurrences: 2

A3: Feature #4

- Write information about the number of instances into the currently active Word document using the appropriate parts of the Selection object.
- (If Feature #6 is implemented then this information would be written into the respective document in which the count was being conducted).

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A3: Feature #4 (2)

- Format of the written text:
  a) The text written should take the form: "Number occurrences: <*actual number of occurrences of the search word*>"
     - e.g. Number occurrences: 2
  b) This text should appear on its own line i.e. it should be preceded by "a hard return" or a VBA carriage return "vbCr".
  c) The text appears at the end of the document ("end of story").
  d) If the search word (entered with Feature #1) appears two times or more then the text (from Feature #4a) to be written (Feature 4a) is colored red. Credit will be awarded if the text is colored under the correct condition.
  e) If the search word appears three or more times then the text to be written (from Feature #4a) is also bolded. Credit will be awarded if the text is bolded under the correct condition.

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A3: Feature #5

- Double the size (both the height and width change so the proportions of height to size remains the same) of each image (in VBA "InLineShapes" in the document.
- If the document doesn't contain any images then a MsgBox will appear with the message "No images to modify".

A3: #Feature #6

- Program runs Features 2 - 5 on **all the Word documents** at a location specified by the user.
- Features #2-5 are contained in the body of a loop defined for Feature #6.
  - Feature #1 runs only once, the program searches for the same word for **all** Word documents.
-

A3: Parts Of Feature #6

- Prompt the user for the location of the Word documents using an InputBox e.g. e.g. "C:\203".
  - The program should not require that the user enters a slash after the name of the last folder (in this example the containing folder is '203') because your VBA program will automatically add it to the end before trying to open any documents.
- If the user enters an empty location the *program* will display a MsgBox that contains the message "No location entered, ending program" and then the program will end.
- If the location is not empty then the program will successively open each Word document the at that location using the appropriate parts of the Documents collection.

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A3: Parts Of Feature #6 (2)

- The program must **not only open just Word documents** but only open certain types of Word documents:
  - older **Word 97-2003 (.doc)** documents,
  - newer **Word 2007+ (.docx)** documents,
  - **macro enabled documents (.docm)**.
- After opening each Word document the program will apply Features 2 - 5 on each document.

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A3: Documentation Requirements

- Contact information: your full name as provided to the university (make sure it matches, don't include 'nicknames'), student identification number, tutorial number.
- Specifying clearly what features of the assignment that you completed or didn't complete. In order to get credit the documentation has to be clear and complete.

A3: Style Requirements

- Each level of code indenting is consistently 1 tab.
  - Instructions in the sub-routine (between the 'sub' and 'end-sub' is 1 level.
  - The body of IF or WHILE structures counts as another level of indenting.
  - A tab is used for each level of indenting
- Example:

```
Sub exampleIndenting()
    Do while()
        If () then
             if () then
             End if
        else
        End if
    Loop
End sub
```

A3: Style Requirements (2)

- Good naming conventions (e.g. variables, sub-routines, the name of Word document containing the VBA program and constants if applicable) are followed. Some examples of naming conventions are provided in [the VBA Part I notes].
  - https://pages.cpsc.ucalgary.ca/~tamj/2022/203W/notes/pdf/vba_part1.pdf

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First Tutorial (Monday or Tuesday): Programming Constructs

Microsoft Introduction/Overview Of VBA

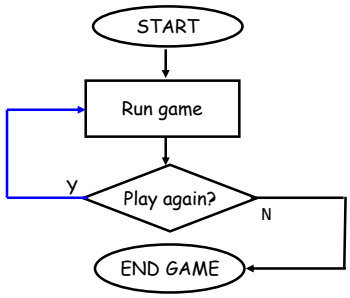
- https://docs.microsoft.com/en-us/office/vba/library-reference/concepts/getting-started-with-vba-in-office

Activities In Tutorial

- TA demos:
  - Used for more complex features (typically multiple steps are required).
  - The tutorial instructor will show on the projector/instructor computer each step for running the feature in Excel.
  - Unless otherwise specified the tutorial material will take the form of a TA demonstrating the use of features in Excel.
  - Slides titled "Lecture Review" are covered for the second time and dealing with less complex material.
    - For this reason they will only be covered briefly in tutorial.
- Student exercises:
  - Used instead of TA demos for simpler features.
  - You will have already been given a summary of how to invoke the feature and the purpose of the exercise is to give you a chance to try it out and get help if needed.

Looping/Repetition

- Used when a part (or the entire) program needs to repeat as long a condition has been met.




```
Do while
(Condition)
    Instruction(s)
Loop
```

- The condition is a Boolean expression.

Example: Counting Program (Up/Increases)

- **Name of the document containing example**: 4loopV1Up
- Features:
  - The program will iterate (count) through the sequence of numbers 1 – 11 in increments of 2 (1, 3, 5, 7, 9, 11)

```
Sub countingLoopV1Up()
    Dim i As Long
    i = 1
    Do While (i <= 11)
        MsgBox ("i=" & i)
        i = i + 2
    Loop
End Sub
```

  - Student exercise: what if the Boolean expression was changed to `(i <= 10)`?

Example: Counting Program (Down/Decreases)

- **Name of the document containing example**: `5countingloopV2Down`
- Features:
  - The program will iterate (count) through the sequence of numbers 10 – 1 in decrements of 3 (10, 7, 4, 1)

```
Sub nineLoopV2()
   Dim i As Long
   i = 10
   Do While (i >= 1)
       MsgBox ("i=" & i)
       i = i - 3
   Loop
End Sub
```

  - Student exercise: what if the Boolean expression was changed to `(i >= 0)`?

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Student Exercise

- Write a program that will, using a loop, display all the multiples of 5 in the range from 5 – 15,625.
- The program will display each multiple of 5 within this range in a `MsgBox` one-at-a-time.
- **Document containing the solution**: `2multiples_of_five_solution`

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Second Tutorial (Wednesday or Thursday)

Nesting: Branches And Loop

- Branches and loops can be nested within each other

Scenario 1

```
If (Boolean) then
    If (Boolean) then
        ...
    End if
End if
```

Scenario 2

```
Do while (Boolean)
   If (Boolean) then
       ...
   End if
Loop
```

Scenario 3

```
If (Boolean) then
    Do while (Boolean)
        ...
    Loop
End if
```

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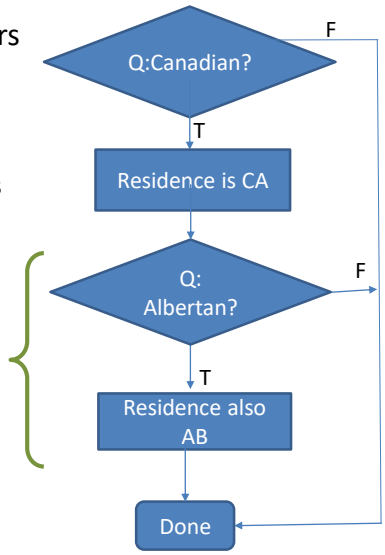
Recognizing When **Nesting** Is Needed

- **Scenario 1**: Only if a question answers true then check if another question answers true or false.
  - Example: If the user entered Canada as country of residence then ask if the user's province of residence is Alberta.
  - Type of nesting: a IF-branch nested inside of an IF-branch

```
If (Boolean) then
    If (Boolean)
        ...
    End If
End If
```



(Key Part: IF) Nested Inside An IF

- Nesting: a structure (e.g. IF) is nested inside of another structure (e.g. IF) when the second structure is part of the body of the first structure.
- **Word document containing the example**: 6nesting_branch_within_branch

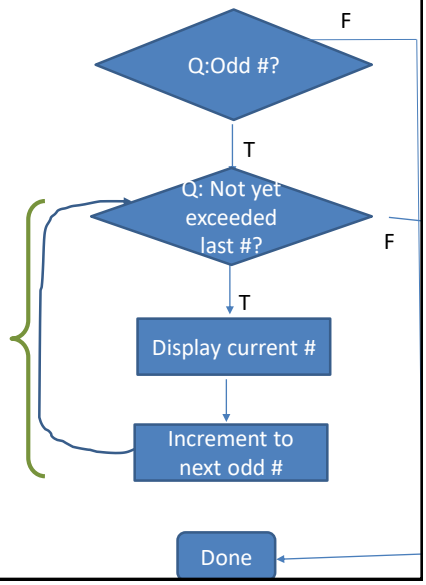
```
'Some parts excluded for brevity.
country = InputBox("Current country of residence: ")
If (country = "Canada") Then
    message = message & "Great country, "
    province = InputBox("Current province of residence: ")
    If (province = "AB") Then
        message = message & " Greatest place on earth ^-*"
    End If 'Checking province
End If 'Checking country
```

- Recall: the check for the Boolean expression for the second IF does not occur unless the first Boolean expression is true. (Don't bother checking if province is AB if country isn't Canada).

Recognizing When **Nesting** Is Needed

- **Scenario 2**: If a question answers true then check if a process should be repeated.
  - Example: If the user entered an odd number then count through a sequence 1 to this number and display each odd number in this sequence.
  - Type of nesting: a `Do-While` loop nested inside of an `IF`-branch

```
If (Boolean) then
    Do While (Boolean)
        ...
    Loop
End If
```



(Key Part: Do-While) Nested Inside An IF

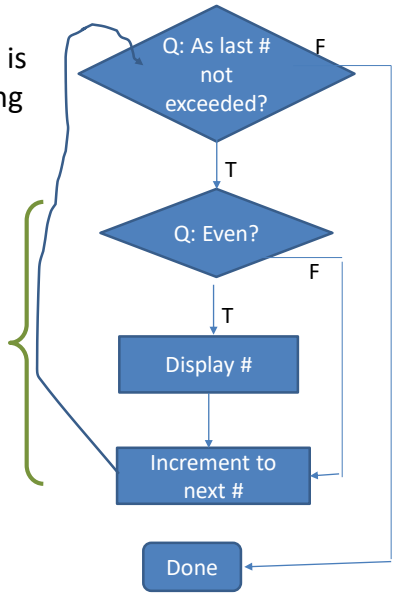
- **Word document containing the example**: 7nesting_loop_in_branch

```
'Variable & constant declaration excluded for brevity
lastOdd = InputBox("Enter last odd number in sequence: ")
remainder = lastOdd Mod 2
If (remainder = 0) Then
    MsgBox (lastOdd & " is even not odd.")
Else
    If (lastOdd <= MAX_ODD) Then
        count = 1
        Do While (count <= lastOdd)
            MsgBox ("Current number = " & count)
            count = count + 2
        Loop
    End If 'End: checks size of last #
End If 'End: checks if # is odd or even
```

Recognizing When **Nesting** Is Needed

- **Scenario 3**: As long some condition is met a question will be asked. As long as some condition is met a popup will be displayed.
  - Example: While the last number in a sequence hasn't been exceeded if the current number is even it will be displayed.
  - Type of nesting: an `IF`-branch nested inside of a `Do-While` loop

```
Do While (Boolean)
    If (Boolean) then
        ...
    End If
Loop
```



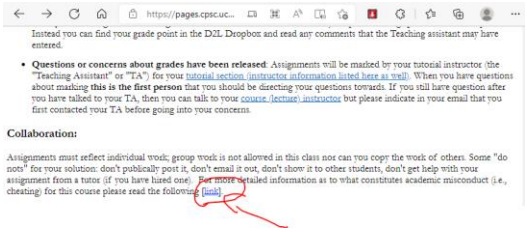
(Key Part: `IF` Nested) Inside A `Do-While`

- **Word document containing the example**: `8nesting_branch_in_loop`

```
Const MAX_NUMBER As Long = 20
Dim lastNumber As Long
Dim count As Long
Dim remainder As Long
lastNumber = InputBox("Enter last number in a sequence: ")
If (lastNumber <= MAX_NUMBER) Then
    count = 1
    Do While (count <= lastNumber)
       remainder = count Mod 2
       If (remainder = 0) Then
           MsgBox ("Current  even #: " & count)
       End If
       count = count + 1
    Loop
End If
```

Collaboration Vs. Misconduct

- There's a link to additional details in every assignment and exercise description.


Instead you can find your grade point in the D2L Dropbox and read any comments that the Teaching assistant may have entered.

- **Questions or concerns about grades have been released**: Assignments will be marked by your tutorial instructor (the "Teaching Assistant" or "TA") for your tutorial section (instructor information listed here as well). When you have questions about marking **this is the first person** that you should be directing your questions towards. If you still have question after you have talked to your TA, then you can talk to your course (lecture) instructor but please indicate in your email that you first contacted your TA before going into your concerns.

Collaboration:

Assignments must reflect individual work; group work is not allowed in this class nor can you copy the work of others. Some "do nots" for your solution: don't publically post it, don't email it out, don't show it to other students, don't get help with your assignment from a tutor (if you have hired one). For more detailed information as to what constitutes academic misconduct (i.e., cheating) for this course please read the following: [link]

- Web address:
  - https://pages.cpsc.ucalgary.ca/~tamj/2022/203W/assignments/misconduct.html

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Avoiding Misconduct

- Some "do nots" for your solution: don't publically post it, don't email it out, don't show it to other students, don't get help with your assignment from a tutor (if you have hired one).
- You cannot copy the work of other students nor can students work in groups. To avoid potential cases of misconduct students should not show or otherwise provide their assignment solutions to their classmates.

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What Is Academic Misconduct?

- Cheating has occurred if you hand in someone else's work as if it were your own *(without crediting* the other person).
- If a student knowingly provides his or her graded work to another student then both students are guilty of academic misconduct (the first student helped the second student to cheat).

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What Happens If I Cite My Sources

- You are required to cite all sources including lecture and tutorial notes (if applicable). If you don't cite the source then you have made the strong implication that this work is yours when it isn't so you will be guilty of academic misconduct.
- What happens if you include someone else's work and *you do* credit the other person properly (this doesn't apply to your classmates, recall that you are not to see the assignment work of other students).
- This won't count as cheating but since someone else did the work for that section of your assignment you won't get credit for that part of the assignment.
  - You could get marks for the other parts of the assignment.
  - The crediting of other's people work must be very specific and clear because your marker needs to be able to unambiguously determine which parts of your assignment did you complete and which parts came from an outside source.

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How To Cite Your Sources

- The format of the citation isn't what's important.
- Instead you should focus on clearly communicating to your marker exactly what parts of your submission that you completed and what parts come from external sources.
  - If there is no citation then the assumption is that you are the sole source.
- One approach: use the "sandwich method"

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Example Of Sandwiching Your Citation

Start of citation

Sandwiched code from an external source

```
' BEGIN: code for accessing Word documents in a folder comes from the lecture
' example 20loopFolder
directoryPath = InputBox("Location for files e.g. C:\temp\203\dirExample2\")
If (directoryPath = "") Then
    MsgBox ("The path you entered '" & directoryPath & "' is empty.")
Else
    ' Dir either returns the name of a file in the folder or an empty string
    currentFile = Dir(directoryPath & "*.doc*") 'Opens only Word 2003 or 2007 documents
    If (currentFile = "") Then
        MsgBox (directoryPath & " does not contain any Word documents")
    End If
    ' Successively access each file (any type) in the folder until the last one has been
    ' accessed an then an empty string is returned
    Do While (currentFile <> "")
        MsgBox (currentFile) ' Display file name in popup
        Documents.Open (directoryPath & currentFile) ' Use filename to open the Word document
        numTypos = ActiveDocument.SpellingErrors.Count
        Selection.HomeKey Unit:=wdStory
        Selection.Font.ColorIndex = wdBlue
        Selection.TypeText ("typos " & numTypos)
        ActiveDocument.Close (wdSaveChanges)


        currentFile = Dir  ' Move onto next document in folder
    Loop
End If
' END: of code from the 20loopFolder example
```

End of citation

- All external code is sandwiched.
- Any code outside of a sandwich is assumed to be written by the student (make sure this is ac

What If You Hired A Tutor?

- Can I get help on an assignment from this person?
- Tutors can be useful helping to clarify concepts (e.g. what is 'loop' in programming) or showing you where to find features in Office or how they work. The problem with going over an assignment with a tutor is that the 'help' ends up with the tutor completing some or all of the assignment for you.
- This is similar to getting a solution from a class mate because you didn't do the work so it is likely that it will be ruled as academic misconduct.

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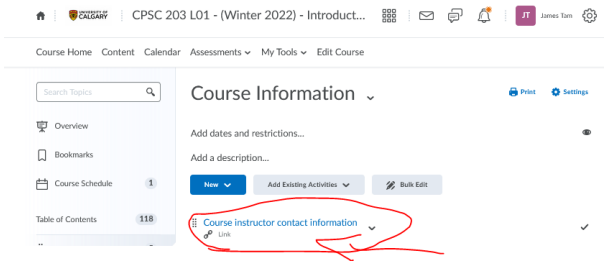
What If We Have Questions About What's Allowed?

- Normally you can ask the Teaching Assistants questions.
- If you have questions about what's allowed and not allowed in terms of misconduct then you should ask the course instructor rather than the TA.
  - Link to the contact times/information for the course instructor in D2L:



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