

Applications Programming

Final Review

Computer Model

- Organization of a computer
- Math models
- Algorithms
 - sequence
 - selection
 - repetition
 - subtasks
- Computerized models
 - Editing the source code of a program
 - Testing the program (run it using example data)

Excel

- understand the notion of rows, columns, and cells
- understand the difference between relative and absolute references
- understand when, where and how to enter data and/or formulae
- Write formula that use relative and/or absolute references
- use appropriate Excel built-in functions in formula

Excel Model

- How to build an Excel Model
- Model Parameters
- Raw data vs Processed data
- Formula with right types of cell references

Programming

- With programming in general, you should be able to:
 - understand what an algorithm is
 - develop algorithms to solve problems
 - write VBA programs to realize the algorithms

VBA Programming (I)

- understand how to read data from Excel cells and write data to Excel cells
- understand how to navigate the cells in a worksheet using function Cells, ActiveCell and Offset.
- understand when and how to use message boxes and input boxes
- understand data and basic data types
- understand what a variable is
- declare a variable
- understand named constants
- write and use math, boolean and string expressions

VBA Programming (II)

- know the syntax, semantics and logic implications of the assignment statements, conditional statements and repetition statements
- develop a VBA program to solve problems
- read VBA programs and understand what result would be produced when the programs are executed
- use procedures to divide a problem into sub-problems
- write programs using array as a data structure to store data
- understand the concept of objects and their special assignment statements
- have the basic concepts about userform and some of the controls
- understand userform and some control's properties
- understand what is event driven programming

VBA Topics

- Data types, literal values, variable/constant declaration, and Option Explicit
- Math expressions, String expressions and Boolean expressions
- Assignment statement
- Input/Output statement
- Read data from worksheet, write data to worksheet
- Conditional statement (If family, Select-Case statement)
- Repetition statement
(For-Next, Do-while-Loop, Do-Until-Loop, Do-Loop-While, Do-Loop-Until)

VBA Procedures

- Two types of procedures
 - Function
 - Subroutine
- Design/Implement a procedure
- Use/Call a procedure
- Parameter passing
 - Pass by value (ByVal)
 - Pass by reference (ByRef)

VBA Arrays

- Declare an array variable
- Array capacity vs Array size
- index of array elements (Option Base 0 vs Option Base 1)
- access an array element
- multi-dimensional arrays
- sorted arrays vs unsorted arrays
- typical applications of arrays
- Pass an array variable to a procedure -- byRef only
- Treat worksheet as a 2-d array, treat row/column of worksheet as a 1-d array

Userform Concepts

- What is a userform?
- What are the controls?
- option buttons vs checkboxes
- Common properties of the controls
- What is an event?
- What is event driven programming?

Classes and Objects

- Class as a data type
- Objects
- Properties
- some Excel built-in objects
- how to set an object variable to represent an object
- how to access an object's properties and methods