SOLVING PROBLEMS WITH MODERN EXCEL & CHATGPT

Talia Cao

Manager, SumProduct

www.linkedin.com/in/caongocdathao/

talia.cao@sumproduct.com

www.sumproduct.com

EXCEL VIRTUALLY GLOBAL 2023

SumProduct

Microsoft

MVP Microsoft® Most Valuable Professional

General Approach

- Break the problem down into **smaller steps**
- Identify which **Excel functions & features** to apply in each step
- Brainstorm **your solutions**
- **Ask ChatGPT** to find another solution or optimise yours.

Tools

- Goal Seek / Solver
- Dynamic Arrays & other Excel functions
- VBA
- Power Query
- LAMBDA
- ChatGPT etc.

Problem A. Solving Algebraic Equations

$$2x^3 - 7x^2 + 12 = 0$$

$$\frac{1}{x} + \frac{x}{1-2x} = 0$$

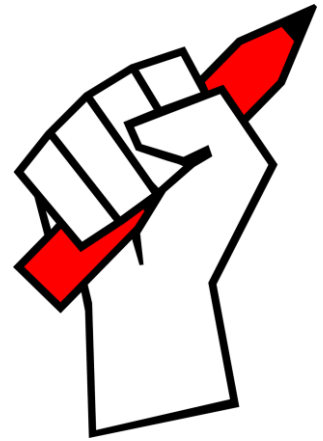
$$\ln\left(\frac{2x+1}{4}\right) - 2 = 0$$

Solving Algebraic Equations

Option 1: Goal Seek / Solver

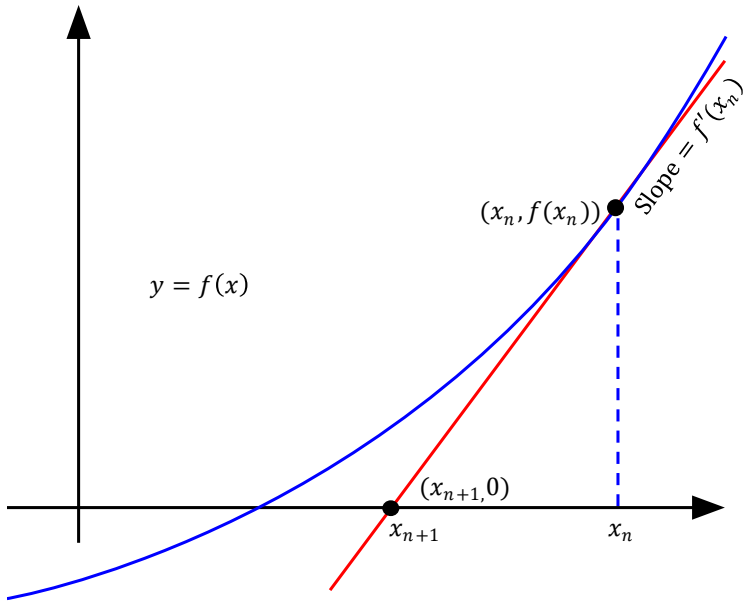
Solving Algebraic Equations

Option 2: Brute force method – Excel functions

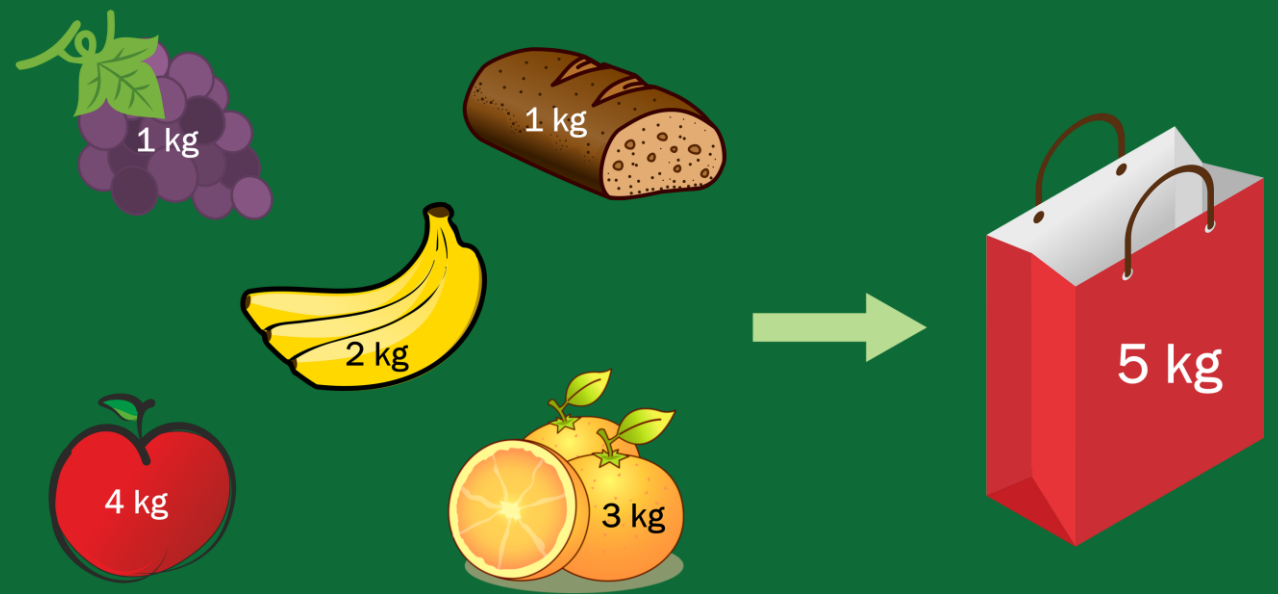


Solving Algebraic Equations

Option 3: Newton's method
– ChatGPT & Recursive LAMBDA



Problem B.
Sum to Target

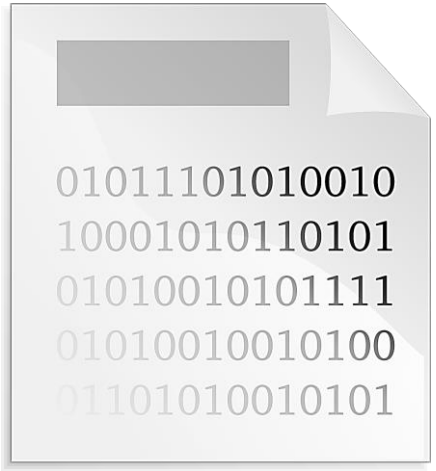


Real-Life Applications

- **Daily life:** shopping cart, study/travel backpack, task allocation
- **Operations:** allocating boxes to pallets
- **Accounting:** matching invoices with a lump sum payment
- **Finance:** selection of investments and portfolios
- etc.

Sum to Target

Option 1: Binary method



Sum to Target

Option 2: ChatGPT & Power Query

Sum to Target – Option 2 Example

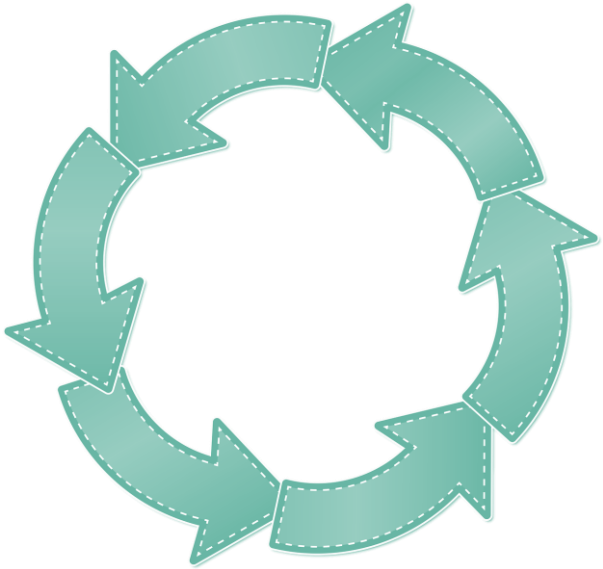
- **Start:**
  - **target = 4**
  - **list = {3,1,2}**
  - cSum = 0
  - cCom = { }
- **Iteration 1:**
  - No = 3; ID = 1
  - nSum = 0+3 = 3 < 4
  - nCom = {3}
  - nList = {1,2}
- Iteration 1.1:
  - No = 1; ID = 1; ID1 = 1
  - nSum = 3+1 = 4 = 4
  - nCom = {3,1}
  - Return acc[Value] = {{3,1}}
- Iteration 1.2:
  - No = 2; ID = 1; ID1 = 2
  - nSum = 3+2 = 5 > 4
  - Return previous acc[Value] = {{3,1}}
- **Iteration 2:**
  - No = 1; ID = 2
  - nSum = 0+1 = 1 < 4
  - nCom = {1}
  - nList = {2}
- Iteration 2.1:
  - No = 2; ID = 2; ID2 = 1
  - nSum = 1+2 = 3 < 4
  - nCom = {1,2}
  - nList = { } -> end of sub-loop
  - Return previous acc[Value] = {{3,1}}
- **Iteration 3:**
  - No = 2; ID = 3
  - nSum = 0+2 = 2 < 4
  - nCom = {2}
  - nList = { } -> end of loop
  - Return previous acc[Value] = {{3,1}}

{3,1}

6 iterations < $2^3 - 1 = 7$ checks
in the Binary method!

Sum to Target

Option 3: Recursive LAMBDA



Summary

General Approach	Problem A. Algebraic Equations	Problem B. Sum to Target	Practice Resources
• Break problems down • Identify Excel tools • Brainstorm solutions • Ask ChatGPT	• Goal Seek / Solver • Brute force method • Newton's method	• Binary method • Power Query • Recursive LAMBDA	• FFF MMM blogs • Reddit • Discord • Google

EXCEL VIRTUALLY GLOBAL 2023

Thank you! 😊

Evaluations!

Solving Problems with Modern Excel & ChatGPT

www.linkedin.com/in/caongocdathao/

talia.cao@sumproduct.com

www.sumproduct.com

EXCEL VIRTUALLY GLOBAL 2023

Please provide feedback on this presentation using the below link or QR code

bit.ly/EVG2023feedback

SumProduct

Microsoft

MVP Microsoft® Most Valuable Professional

The Microsoft Excel team is seeking research participants!

We love hearing from our customers and your involvement will help shape the future of Excel. If you're willing to be contacted to provide feedback and participate in future research studies, please sign up!

Thank you for your time and consideration,
Microsoft Excel Team

http://aka.ms/ExcelVGResearch

Microsoft