

*Build the Tools You Need:
Harnessing LLMs for Business Success*



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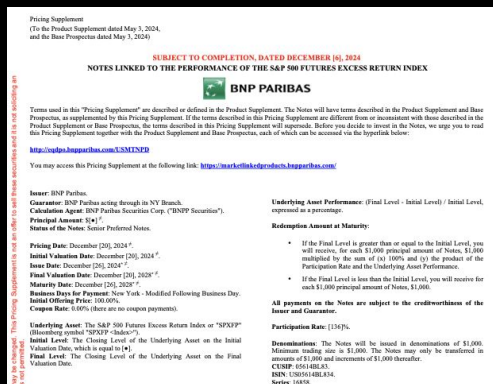
30+ years of hands-on semiconductor experience

CHAT HAS ALREADY REPLACED SEARCH

TED^x CSTU

Evaluate this investment. How does it compare to an investment in the S&P 500? How would it do if I invested in it in 2008?

Attached Prospectus:



Compared to the S&P 500 (Direct Investment)

	BNP Structured Note	Direct S&P 500 Investment (e.g. SPY)
Upside	136% participation (higher than 100%)	100% of market gains
Downside	Principal protected	Full market downside risk
Dividends	Not included	Included (~1.5%–2% annual)
Liquidity	Illiquid, must hold to maturity for full benefit	Daily liquidity
Tax	Treated as contingent debt, potentially unfavorable	Qualified dividends + capital gains possible

So you're trading off dividends and liquidity for leveraged upside and downside protection.

But really, we want AI to help us accomplish what we couldn't do before.

UNDERSTAND THEIR LIMITATIONS

- Large Language Models are probabilistic, not precise
 - a. They are weak at deterministic logic and rule-based systems
 - b. You wouldn't want to use them to fill out your tax return or run a chess engine
- LLMs are weak at math
 - a. They might be able to tell you what Laplace transform is, but can't calculate it
- LLMs often don't know their own weaknesses
 - a. They can be super confident at things they are not good at

LLMs are 'vibe' machines

Like any tool, we need to learn how to effectively use AI models

- Treat and expect your AI to be like a summer intern
- Be very clear and precise on what you want it to do
- Break tasks down step by step. You have to help the AI.
- Do not give it too much information. Keep it bite sized.
- If you know the formulas it should use, tell it. If you don't know the formulas, ask the AI to give you the formulas first, before using them.
- Check its answers, or ask it to check its answers
 - You can also take a screenshot of your output and ask the AI about it
- Longer sessions can get stuck and get stuck. Restart or re-write the old prompt rather than try to correct problems using multiple follow-up prompts

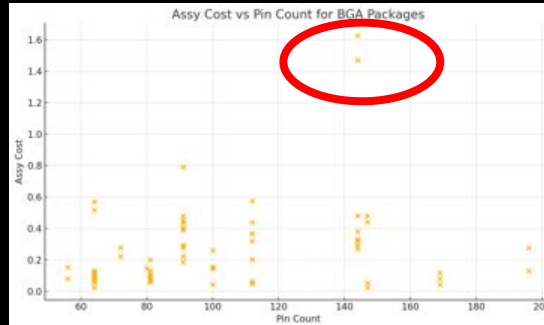
FINDING PATTERNS AND ABNORMALITIES

Input Excel of IC costs:

Project Name	PKG	Assay Cost	Body Size	Pin Count	...
185	Los Angeles	BGA	1.626	10*10	144.0
2	Los Angeles	FBGA	1.47	10*10	144.0
175	Atlanta	FBGA	0.791	9*5	91.0
176	Atlanta	FBGA	0.791	9*5	91.0
211	Charlotte	FBGA	0.576	11*5.15	112.0
181	Miami	FBGA	0.569	4*4	64.0

1. For all the PKG types that contain the letters 'BGA', create a scatter chart showing the Assy Cost on the Y axis and the pin count on the X axis.
2. Make a table showing the top 10 outliers where the cost is unexpectedly high. Show the Project name, the PKG type, the Assy cost, the body size, the pin count, and the wire type

Results:



Top 10 Assy Cost Outliers (BGA)

#	Project Name	PKG	Assy Cost	Body Size	Pin count
1	185 Los Angeles	BGA	1.626	10*10	144.0
2	2 Los Angeles	FBGA	1.47	10*10	144.0
3	175 Atlanta	FBGA	0.791	9*5	91.0
4	176 Atlanta	FBGA	0.791	9*5	91.0
5	211 Charlotte	FBGA	0.576	11*5.15	112.0
6	181 Miami	FBGA	0.569	4*4	64.0

THERE'S AN APP FOR THAT

- 2 million apps on Apple's App Store
- Full of ads, subscriptions, and sometimes, spyware
- ... and none of them are customized to your specific needs
 - We may want an app instead of just chat, because:
 - The App can be simpler than typing in a prompt every time
 - I need some calculation or memory, and not just a vibe

But if you're not a programmer,
How can we make our own App?

SHIFTING FROM 'HOW' TO 'WHAT'

Think carefully about exactly what you want

- Let's say, I'm look at buying a \$500K apartment
- I can receive rents of \$20K/year
- Then sell the apartment after 7 years for \$600K
- Is this a good investment?

We'll make an app to calculate this ...

TOOLS NEEDED

1. Google Gemini, or a similar service
 - <https://aistudio.google.com>
 - Sign in with your existing Google account
 - *'Vibe coding' is not possible with older models*
 - You can switch between different models to keep within your free quota
2. A free web hosting service, like Neocities
 - <https://neocities.org/>
 - Sign up for a free account
 - Your website will be: <https://USERNAME.neocities.org>

Different AIs have different styles. Gemini is free.

1. *What are good metrics for rating investments?*
2. *Please give me formulas for Net Present Value (NPV), Internal Rate of Return (IRR), and the Real Return on Investment (RROI) given the initial investment, the inflation rate, and 10 years of returns. Use the inflation rate as the NPV discount rate.*
3. *Provide source code, in a single file, for a mobile website to calculate Return on Investment. Create input text boxes for the initial investment, the inflation rate, and the following 10 years of returns. Calculate and show the NPV, IRR, and RROI.*

Copy the Gemini code.

Don't be intimidated by the code.
You just need to copy it.



The screenshot shows a code editor interface with a title bar containing 'Get API key', 'Studio', 'Dashboard', and 'Documentation'. The main content area is titled 'Investment Formulas: NPV, IRR, RROI' and contains the following JavaScript code:

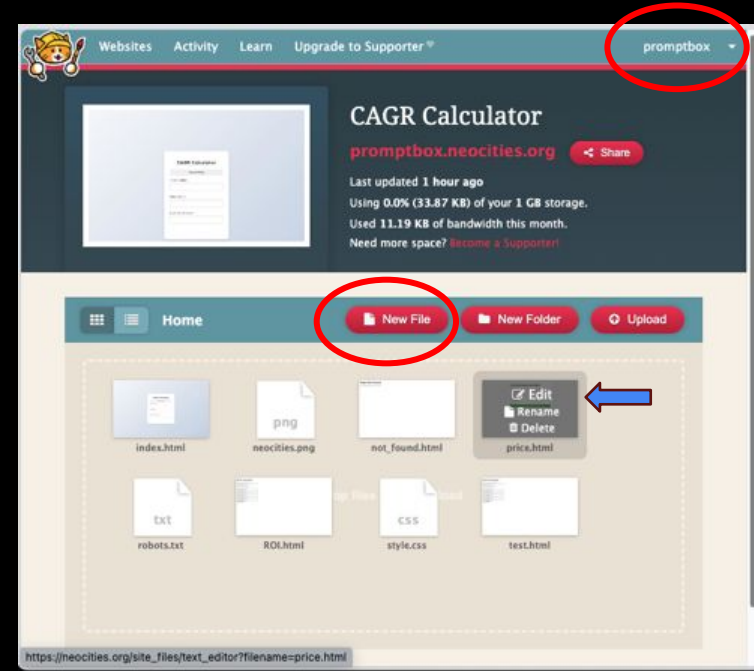
```
let npv = cashFlows[0]; // Start with initial investment (already negative)
for (let t = 1; t < cashFlows.length; t++) {
  npv += cashFlows[t] / Math.pow(1 + discountRate, t);
}
return npv;

// = Calculates Internal Rate of Return (IRR) using an iterative approach (bisection method).
@param {number[]} cashFlows - Array of cash flows (CFs).
```

At the bottom of the editor, there is a text input field with the placeholder 'Type something' and a blue 'Stop' button.

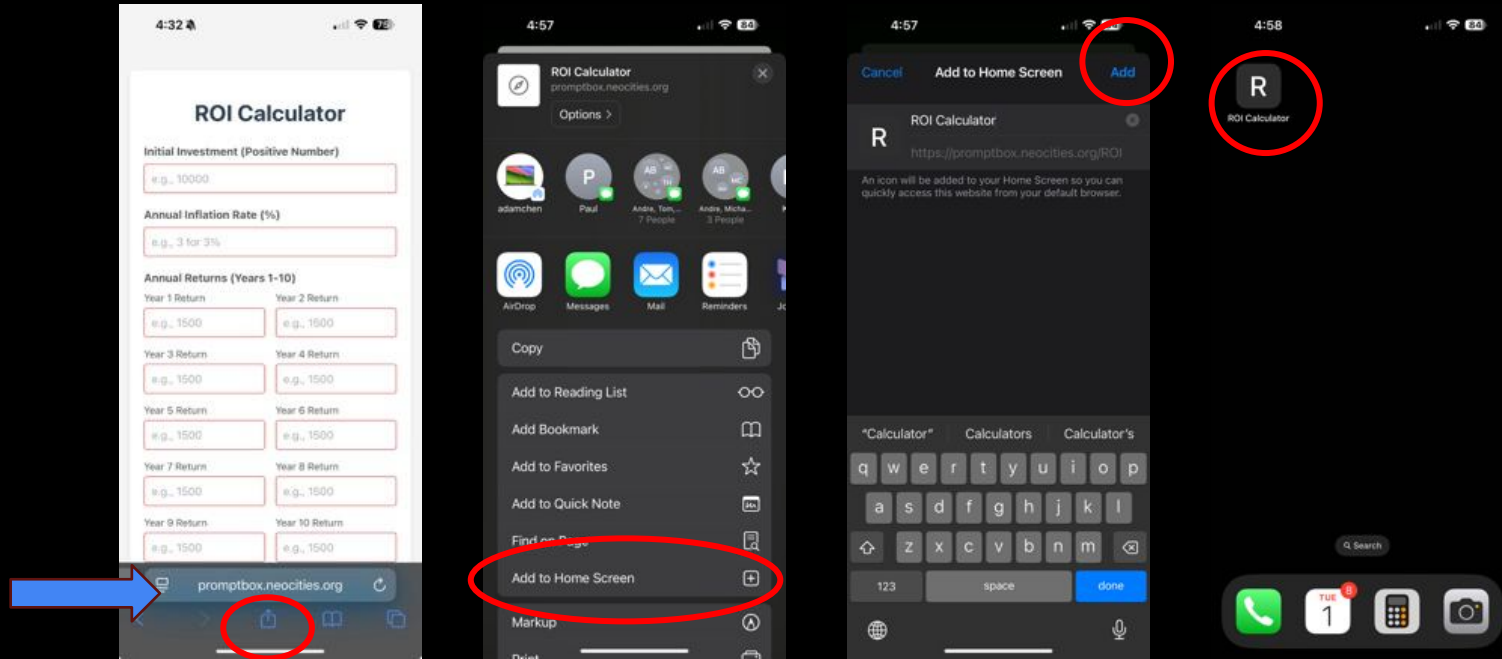
PASTE THE CODE TO NEOCITIES

1. Create a new file at Neocities
2. Call it 'ROI.html'. Select 'Edit'
3. Paste the Gemini code to this file
4. Select 'Save'
5. On your phone's browser, enter:
'USERNAME.neocities.org/ROI'



CREATE A SHORTCUT ON YOUR PHONE (optional)

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MAKING IMPROVEMENTS

The app doesn't look very nice and the user input is fixed to 10 years, let's make it more flexible.

1. *Take the annual returns in a single text field with values separated by commas. Change the calculation to dynamically use the number of returns the user enters (not fixed to 10 years).*
2. *Add a 'Clear' button to quickly clear all the text fields. Put it on the same row as the 'Analyze' button. Use a percentage for the inflation rate. Have it default to 5%, but don't show defaults for other inputs.*
3. *Format the app to have it look better on mobile. Add some shadows and color. Reduce the width of the text fields by 30%. Hide the calculations until the 'Analyze' button is pressed.*

Copy the new code to Neocities.

Refresh your phone browser. No need to create a new shortcut.

Dynamic ROI Calculator

Initial Investment

Annual Inflation Rate (%)

Annual Returns (Comma-Separated)

Enter cash return for each period.

Analyze

Clear

Calculation Results

Number of Return Periods: 8

Net Present Value (NPV): **\$21.83**

AI CAN HALLUCINATE

It's best to test the AI output. Compare it to Excel.
If you see a problem, describe it and ask the AI to fix it.

1. *Review the code. Are the calculations for NPV, IRR, and Real ROI correct? Is the code robust? What are recommended improvements?*
2. *Modify the code with these recommendations, but keep using the inflation rate as the NPV discount rate.*

Aspect	Rating	Issues	Recommendations
NPV Calc	✓ Good	None	Keep as-is.
IRR Calc	✗ Flawed	Unstable	Use binary search or a library.
Real ROI	✓ Good	None	Add deflation warning.
Input Handling	✗ Weak	No validation	Add <code>parseInput()</code> .
Edge Cases	✗ Weak	Crashes on zeros	Add checks.
UI/UX	△ Decent	Static inputs	Make years dynamic.

You can ask the AI to review its work, but it's important to start a new chat or use a different AI. Otherwise, the AI will try to justify what it did initially.

(You will need to copy the complete code file into the prompt window.)

MAKE IT ACTIONABLE

1. *Based on these calculations, show me a method for rating an investment as Bad, Poor, Marginal, Good, or Great. How do these ratings compare to other investments like Treasury bonds, the S&P 500, a Bank CD, etc.?*
2. *If an investment is not "Great", give me a formula to determine an alternative initial investment that would make the investment "Great".*
3. *Modify the code to display a rating and its explanation. If appropriate, include the suggested initial investment. Show me the complete html code.*

Copy the new code to Neocities. Refresh your phone browser.

Now we know how much to bid for that apartment...

Analyze Clear

Analysis Results

Number of Periods:	8
Net Present Value (NPV):	\$21.83
Internal Rate of Return (IRR):	5.64%
Real Return (RROI):	0.61%
Investment Rating:	Poor

Beats inflation, but the real gain (increase in purchasing power) is minimal (0-2% per year). Likely underperforms safer alternatives relative to risk.

To potentially achieve a 'Great' rating (RROI > 7.000000000000001%), the initial investment should ideally not have exceeded \$326.63.

CREATING APPS

3 steps:

1. Describe what you want to the AI
2. Copy the code to a web hosting platform
3. Add a shortcut on your phone

You can always make future changes

Current best models for coding:

- Google Gemini 2.5 Pro Experimental (free)
- Anthropic Claude 3.7 Sonnet (free)
- OpenAI o4-mini-high (paid)
- But this changes every week ...

AI can create much more sophisticated apps. However, this would require you to use command line interfaces and run shell scripts,, set up environment variables, learn and use an IDE (Integrated Development Environment), as well as generate and sign executable files.

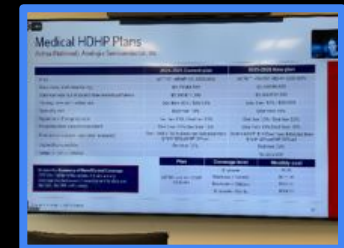
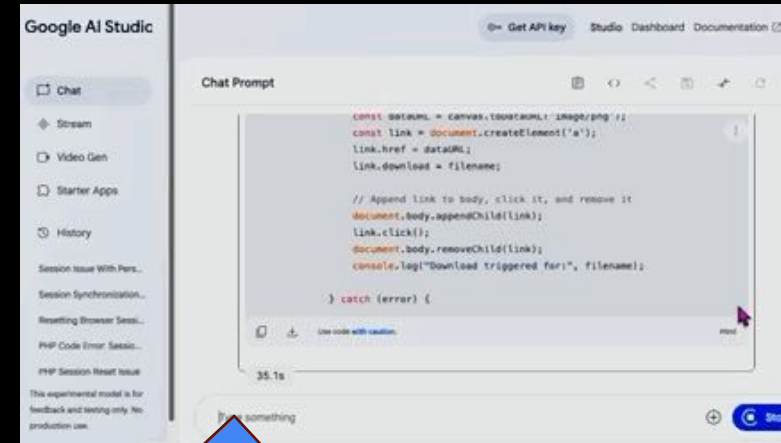
These are trivial tasks for a software developer, but they can feel overwhelming and tedious to non-technical people, creating a real barrier to getting started.

FILE UTILITIES

Now you can create web apps that work with your files.

Let's say we want a tool to shrink pictures before emailing them.

Create a web app with a single html/js file that allows the user to drag and drop to upload a photo. Automatically resize and convert this file to a 500 pixel wide png file while retaining the original aspect ratio. Automatically download the png when the conversion completes. Keep the same filename, but with '_small' appended.



CONVERTING DATA

Or we want a tool to convert our data.

Create a web app with single html/js file that allows the user to drag and drop to upload a Word document (docx). This document consists of a numbered list of names, in this format, 1. Last name, First name, Date (MM/DD/YY). Convert this document to an Excel file (xlsx), then automatically download it. The Excel file should have the data formatted in columns, First name, Last name, and Date in the format (January, 1, 2002). If the year (YY) in the date is less than 25, assume it is in the 2000's. Otherwise assume it is in the 1900's.

Microsoft Word
docx Input:

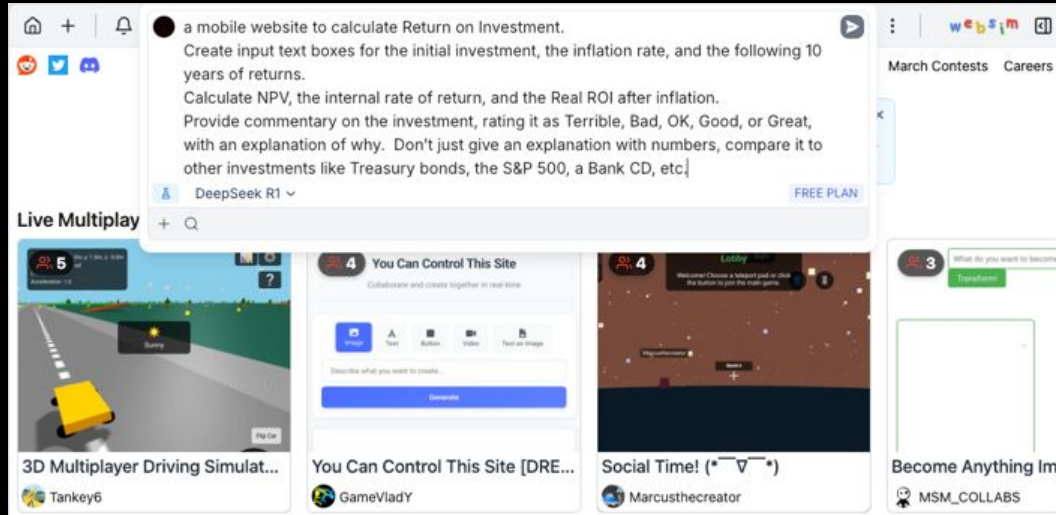
1. Carter, Emily, 02/14/01
2. Robinson, James, 08/23/84
3. Nguyen, Sophia, 11/05/97
4. Patel, Arjun, 03/19/08
5. Thompson, Mia, 07/30/95
6. Kim, Daniel, 09/12/92
7. Martinez, Isabella, 01/06/89
8. Chen, Leo, 05/15/93
9. Walker, Olivia, 10/29/86
10. Flores, Mateo, 06/08/00

Microsoft Excel
xlsx Output:

First name				
	A	B	C	D
1	First name	Last name	Date	
2	Emily	Carter	February, 14, 2001	
3	James	Robinson	August, 23, 1984	
4	Sophia	Nguyen	November, 5, 1997	
5	Arjun	Patel	March, 19, 2008	
6	Mia	Thompson	July, 30, 1995	
7	Daniel	Kim	September, 12, 1992	
8	Isabella	Martinez	January, 6, 1989	
9	Leo	Chen	May, 15, 1993	
10	Olivia	Walker	October, 29, 1986	
11	Mateo	Flores	June, 8, 2000	
12	Chloe	Rivera	April, 25, 1985	

ONE-SHOT METHOD

<https://websim.ai/> - no account needed



What would you like to change?

Investment Analyzer

Initial Investment (\$):
500

Annual Inflation Rate (%):
5

Annual Returns (\$):

Year 1:	Year 2:	Year 3:	Year 4:	Year 5:
20	20	20	20	20
Year 6:	Year 7:	Year 8:	Year 9:	Year 10:
20	20	20	20	600

Calculate ROI

NPV: \$10.50

IRR: 5.26%

Real ROI: 95.77%

Rating: Terrible

Failing to beat inflation. Even Treasury bills (~2%) would provide better returns with lower risk.

REDEFINE WHAT'S POSSIBLE

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You probably won't lose your job to AI,
But you may lose your job to people who use AI.
Let's be on the right side of that equation!

Thank you



More AI generated apps and utilities at <https://www.promptbox.cn/>