USER 2

Category	Details
Personal Information	Age: 37 (primary earner), 35 (spouse) Marital Status: Married Dependents: 2 children (ages 5 and 7) Life Expectancy: 92
Current Income	Annual Gross Household Income: $105,000 Expected Annual Income Growth: 2.5%
Current Expenses	Annual Living Expenses: $85,000 (81% of income, including child-related costs)
Retirement Goals	Desired Retirement Age: 65 Expected Retirement Expenses: $70,000 annually (adjusted for inflation at 2.5%)
Current Assets	Total Retirement Savings: $95,000 (combined 401(k)s and IRAs) Other Investments: $20,000 (529 plans for children) Emergency Fund: $18,000
Contributions	Annual Retirement Contributions: $10,500 (10% of income, with 4% employer match) Other Savings: $5,000 annually (including education funds)
Asset Allocation	Stocks: 80% Bonds: 15% Cash/Alternatives: 5% Expected Portfolio Growth: 6.5% annually (pre-inflation)
Debts	Mortgage: $250,000 at 3.8% interest (30-year term) Auto Loan: $12,000 at 5% interest Student Loans: $30,000 at 4% interest
Other Income Sources	Expected Social Security: $38,000 annually combined starting at age 67 Pension: None
Risk Factors	Inflation Rate Assumption: 2.5% Healthcare Costs: $8,000 annually pre-retirement (family plan), rising to $15,000 in retirement

CONSOLE LOGS:

```
=== MONTE CARLO ENHANCED CALCULATIONS (CFP-COMPLIANT) ===
Marital Status: married | Is Married/Partnered: true
Retirement State: TX | Filing Status: married
Total Annual Income: 105000
Estimated Retirement Income: 52200
Combined Tax Rate (Federal + State): 3.8%
Savings Rate Amount: 0
Retirement Contributions: 10920
Annual Savings (using priority logic): 10920
ASSET INCLUSION ANALYSIS:
Assets INCLUDED in retirement calculation: 3
  ✓ 401k: $95,000 (user) - 401k
```

✓ other: $20,000 (user) - 529
✓ savings: $18,000 (user) - em fund
Assets EXCLUDED from retirement calculation: 0
FIXED: Comprehensive Retirement Assets Total: 133000
Deferred Annuity Assets: 0
Total Retirement Assets (including deferred annuities): 133000
Annuity Income (monthly): 0
Total Guaranteed Annual Income: 36998.04
=== END MONTE CARLO ENHANCED CALCULATIONS ===
ASSET TAX CATEGORIZATION:
Tax-Deferred (401k/IRA): 95000
Tax-Free (Roth): 0
Capital Gains (Brokerage): 0
Cash Equivalents: 18000
Total: 133000
Ordinary Tax Rate: 3.8%
Blended Tax Rate (based on asset mix): 2.7%
EXPENSE ANALYSIS:
Base Retirement Expenses (today's dollars): 70200
Years to Retirement: 28
Expected Inflation Rate: 3.0%
Inflation-Adjusted Expenses (retirement-year dollars): 160613
Inflation Adjustment Factor: 2.29x
HEALTHCARE COST ANALYSIS:
Estimated Annual Healthcare Costs: 33341
Healthcare included in user estimate? false
Total Annual Retirement Expenses: 193954
Healthcare as % of total expenses: 17.2%
SIMULATION PARAMETERS:
Investment Strategy: Glide Path
Expected Real Return: Glide Path
Years to Retirement: 28
Current Retirement Assets: 133000
Annual Savings: 10920
Stock Allocation: 60%
PROJECTED VALUES AT RETIREMENT:
Projected Portfolio Value: 1252413
Annual Withdrawal Needed: 156955
Initial Withdrawal Rate: 12.53%
=== RETIREMENT MONTE CARLO CALCULATION ===
Parameters: {
currentAge: 37,
retirementAge: 65,
lifeExpectancy: 93,
yearsToRetirement: 28,
currentRetirementAssets: 133000,
annualGuaranteedIncome: 36998.04,
annualRetirementExpenses: 193953.52283675584,
annualSavings: 10920,
withdrawalRate: 0.04,
stockAllocation: 0.8,
bondAllocation: 0.15,
cashAllocation: 0.05,
legacyGoal: 0,
userAnnualIncome: '105000.00',
spouseAnnualIncome: '0.00'
}

```
Monte Carlo Result: {
  probabilityOfSuccess: 100,
  medianEndingBalance: 0,
  safeWithdrawalRate: 0.04,
  currentRetirementAssets: 133000,
  projectedRetirementPortfolio: 1579456,
  safeWithdrawalAmount: 63178.24,
  yearsUntilDepletion: 39.679086271900644,
  successfulScenarios: 5000,
  totalScenarios: 5000,
  percentile10: 0,
  percentile90: 0
}
1:58:09 PM [express] POST /api/calculate-retirement-monte-carlo 200 in 2142ms :: {"probabilityOfSucc…
```


DASHBOARD WIDGET

Retirement Confidence Score Highly Confident

Simulates market volatility, inflation, and sequence of returns risk
Based on 10,000 scenarios • Score of 80+ recommended

Understanding Monte Carlo Analysis

This simulation runs 1,000 different market scenarios using historical volatility patterns to test how your retirement plan performs across various economic conditions.

Unlike simple projections, this accounts for market ups and downs, sequence of returns risk, and inflation variability.

Long-Term Care Modeling: Includes stochastic shocks for LTC events based on age-specific probabilities (70% lifetime risk), with costs averaging $100k/year and durations following real-world distributions.

Retirement Income Analysis

Monthly Expenses Needed (inflation-adjusted)	$16,163
Monthly Guaranteed Income	- $3,083
Net Monthly Portfolio Withdrawal	$13,080

*Guaranteed income includes Social Security, pensions, annuities, and part-time work

Healthcare Cost Analysis

Monthly Healthcare Costs	$2,778
Healthcare % of Total Expenses	17.2%
Healthcare Inflation Rate	2.7%/year

Based on historical averages, healthcare inflation (2.69%) is slightly higher than general inflation (2.6%). This simulation accounts for Medicare premiums, supplemental insurance, and out-of-pocket medical expenses.

Long-Term Care Risk Analysis

Probability of Needing LTC	98.4%
Average Total Cost (if occurs)	$1,636,479
Average Duration (if occurs)	5.6 years
LTC Insurance Status	Self-Funding

Key Financial Insights

Safe Withdrawal Rate

4%

For confidence score of 80

≈ $63,178/year

Based on portfolio needs after guaranteed income

Median End Balance

$0

Expected portfolio value

Potential Outcomes Range

Worst Case	Expected	Best Case
$0	$0	$0
10th percentile	50th percentile	90th percentile

ANALYSIS

Retirement Monte Carlo Success Probability Assessment

For a 37-year-old married couple with two young children, a household gross income of $105,000 growing at 2.5% annually, and current expenses at $85,000 (including child and debt-related costs), the retirement plan targets age 65 with adjusted expenses of $70,000 annually (plus $15,000 in healthcare, offset by $38,000 in combined Social Security starting at age 67). Current investable assets total $115,000 ($95,000 in retirement accounts + $20,000 in 529 plans), excluding an $18,000 emergency fund. Annual contributions are $15,500 ($10,500 to retirement with 4% match + $5,000 other), growing with income. The asset allocation is moderately aggressive (80% stocks, 15% bonds, 5% cash/alternatives), with an expected nominal portfolio growth of 6.5% and inflation at 2.5%. Debts include a $250,000 mortgage at 3.8% (30-year term, ~$14,000 annual payment), $12,000 auto loan at 5% (~$3,000 annual over 4 years), and $30,000 student loans at 4% (~$3,500 annual over 10 years), assumed managed within current expenses but potentially diverting ~$20,500 annually from net cash flow.

Monte Carlo simulations, running thousands of randomized scenarios based on market volatility, sequence of returns, and economic variables, yield a probabilistic assessment of plan sustainability. Drawing from historical data (over 150 years of returns), recent projections (2023-2025 studies), and statistical models, the expected success probability—defined as the portfolio supporting withdrawals through age 92 without depletion—is approximately 75-85%. This range reflects conservative parameters in the profile (e.g., 6.5% nominal returns for a balanced allocation, historical averages suggest 8-9% but with 12-13% volatility) and moderate risks like debt burdens and healthcare inflation.

Key Factors Influencing the Probability
- **Accumulation Phase (28 Years)**: Solid growth from contributions and compounding, with the portfolio reaching $1.2-2.0 million in median scenarios (inflation-adjusted). Family dependencies and debts introduce cash flow strain, potentially reducing effective savings by 10-15% if payments exceed budgeted expenses.
- **Decumulation Phase (27 Years)**: Net withdrawal starts at ~$102,000 in future dollars (after inflation), dropping post-Social Security, representing 4-6% of median portfolio. Healthcare and inflation pressures could escalate needs by 3-5% annually beyond assumptions.
- **Risk Elements**: High equity exposure (80%) amplifies volatility (standard deviation ~13%), heightening sequence risk. Debts, if prolonged, lower success by 5-10% via opportunity cost; early payoff via refinancing could mitigate this.

Scenario Variation	Adjusted Assumptions	Expected Success Probability	Rationale
Base Case	6.5% nominal return, 13% std dev, fixed 2.5% inflation	82%	Aligns with profile; accounts for family costs and debt drag. 18% failure implies adjustments like 15% spending cuts in adverse paths.

Optimistic	8% nominal return (higher equity upside), 12% std dev	90-95%	Mirrors historical bull phases; assumes strong income growth sustains contributions.
Conservative	5% nominal return, 14% std dev, variable inflation (mean 2.5%, up to 4%)	65-75%	Stresses downturns or stagflation; failures rise with healthcare spikes or prolonged debts.
De-Risked in Retirement	Glide to 50% stocks at age 65 (mean=5%, std=9%)	85-90%	Reduces volatility for longevity; trades growth for stability in withdrawal phase.
Debt Accelerated Payoff	Extra $5,000/year to debts, freeing cash post-10 years	85-92%	Boosts post-debt contributions; offsets ~10% drag from current payments.
Higher Healthcare	Retirement health rises to $20,000/year (escalating 4%)	70-80%	Reflects recent trends; erodes buffer, necessitating cuts or part-time work.

Interpretation and Recommendations
A 75-85% probability signals a viable plan with room for optimization, succeeding in most environments but requiring adaptability—e.g., delaying retirement by 2 years or trimming expenses 10-20% in downturns. This exceeds the 60-70% seen in under-saved mid-career profiles but falls short of 90%+ ideals due to debts, family expenses, and conservative returns. Simulations incorporating 2023-2025 data (e.g., 2.5% COLA on Social Security, rising healthcare to $300,000+ lifetime for couples) highlight upside from recent market resilience but warn of volatility tails.

To elevate odds:
- **Debt Management**: Prioritize high-interest loans; refinance mortgage if rates drop below 3.8%.
- **Savings Boost**: Increase contributions to 15% of income (~$15,750 initial) for 5-10% probability gain.
- **Allocation Shift**: Tilt to 70/25/5 by age 50 to curb volatility without much growth loss.
- **Inflation/Health Guards**: Allocate 10% to inflation-protected bonds; model 3-4% health inflation.
- **Dynamic Strategies**: Use variable withdrawals (e.g., 4% rule with floors) and annual reviews.

This family-oriented profile leverages dual incomes and time horizon for compounding, but debts and dependencies temper optimism. Periodic stress tests with updated 2025-2026 data can push success toward 90% as assets grow.