STAX SOURCES

Disclaimer: In order to condense information about seven different complex investment types, we had to exclude certain details for the sake of simplicity and increased understanding. This is meant to be an introduction to a range of investment vehicles rather than an exhaustive education on each investment.

In this game, we tried to use real data as much as possible or base our numbers on similar data when historic details were unavailable. We've collected data from 1980-2018. Each game session covers a randomized 20-year segment within that span. In addition to each game using a different starting year, we randomize which stocks, commodities, and index are selected for that time frame, providing replayability and a true sense of market variability.

Of course over that time span, inflation can become a significant variable. Working with 1980 dollars is far different than 2018 dollars. To simplify this process, we abstracted all data and attempted to convert everything into 2018 dollars.

To do this, we used historic Consumer Price Index as a baseline for all calculations. For any given year, we used:

A = CPI in June 2018
B = CPI in whatever month from history the simulation is using
New Value = Historic Value * (A / B)

Example:

Game simulation at a point where it's pulling data from April, 1978. We want to figure out what a stock trading for $10.23 should be in 2018 dollars.

A = CPI in June 2018 = 250.875
B = CPI in April 1978 = 63.9

New Value = $10.23 * (250.875 / 63.9)
New Value = $10.23 * 3.926
New Value = $40.16

If instead our game was pulling data from October, 1992, you'll notice the amount of inflation is less.

A = CPI in June 2018 = 250.875
B = CPI in October 1992 = 141.7

New Value = $10.23 * (250.875 / 141.7)
New Value = $10.23 * 1.77

New Value = $18.11

CPI data - https://www.officialdata.org/articles/consumer-price-index-since-1913/

Throughout the game, players receive investable income semi-annually. We start with a baseline salary of $40,000/yr and then try to model an ambitious, but feasible career trajectory. We give yearly cost of living raises at 3% and occasional salary bumps of $10-20k. From there, we take a percentage of this yearly salary and make it available to the user for investment. We start with 10% and then eventually raise that to 20% of overall salary by the end of the game.

Savings account:
- Interest Rates over time: Could not find data; derived from Treasury rate:
-     https://www.macrotrends.net/

CDs
-     Hybrid data built from https://fred.stlouisfed.org and
http://www.forecast-chart.com/interest-cd-interest.html
-     Penalty fee: simplified to 4% of the deposit

Index Fund:
-     Used ^GSPC, ^NYA
- https://finance.yahoo.com

Stocks:
-     Used ABT, ADM, AEP, AET, AMD, AON, BA, BAC, BAX, BBT, BCE, BLL, BP, BSX, C, CI, COKE, DUK, F, FTR, GE, GIS, GT, HPQ, IBM, IDCC, IP, JNJ, JWN, L, MAT, MMM, MRO, MSI, NWL, RGR, SIG, T, TGT, TSN, XOM, XRX
- https://finance.yahoo.com

Government Bonds:
-     https://www.macrotrends.net/

Crop Commodity:
-        Used: coffee, corn, cotton, soybean, wheat
-     https://www.macrotrends.net/

Gold
-     https://www.macrotrends.net/

To build a salary and saving model, we assumed a relatively ambitious career path with consistent cost of living raises, significant pay raises every few years, and an aggressive savings plan that increases as time goes on.

Year	Salary	Cost of Living Raise	Major Raise	Amount saved	Yearly invested
1	$40,000			10%	$4,000.00
2	$41,200	3%		10%	$4,120.00
3	$42,436	3%		10%	$4,243.60
4	$43,709	3%		10%	$4,370.91
5	$55,020	3%	$ 10,000.00	10%	$5,502.04
6	$56,671	3%		10%	$5,667.10
7	$58,371	3%		10%	$5,837.11
8	$60,122	3%		10%	$6,012.22
9	$61,926	3%		10%	$6,192.59
10	$73,784	3%	$ 10,000.00	15%	$11,067.55
11	$75,997	3%		15%	$11,399.58
12	$78,277	3%		15%	$11,741.56
13	$80,625	3%		15%	$12,093.81
14	$83,044	3%		15%	$12,456.63
15	$95,535	3%	$ 10,000.00	15%	$14,330.32
16	$98,402	3%		15%	$14,760.23
17	$101,354	3%		15%	$15,203.04
18	$104,394	3%		15%	$15,659.13
19	$107,526	3%		15%	$16,128.91
20	$130,752	3%	$ 20,000.00	20%	$26,150.36

	Total:	$206,936.69