

Project 1: Report

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CS 21700

For this part we mainly talk about how we proceed to every single step to calculate the problems. The first part of the problem where buy and sold stocks mostly done in programming and through a while loop it calculates the income until next 60 months.

```
while(months>60){
    int prb=1+rand()%100;// random number generator between 1
to 100.
    std::cout<<"probability:"<<prb<<'\\n';
    if(prb<=50){
        Stock_price=Stock_price;
    }
    else if(prb<=75){
        Stock_price=Stock_price*0.95;
    }
    else if(prb<=100){
        Stock_price=Stock_price*1.05;
    }
    std::cout<<"stock price at that
probability:"<<stock_price<<'\\n';
    // if price drops below 95 convert all capital to stocks.
    if(Stock_price<95 && (init_capital/stock_price) > 1) {
        num_of_stocks = num_of_stocks +floor( init_capital /
stock_price);
        money_owned = init_capital - (floor( init_capital /
stock_price) * stock_price);
    }
    // if price goes up to 110 buy all of them.
    if(Stock_price>110){
        money_owned=init_capital+(num_of_stocks*stock_price);
        num_of_stocks=0;
    }
    money_owned=init_capital*interest_rate;
    months+=1;
    std::cout << "After month " << months << ", your balance
is : $" << init_capital << ", num of stocks :
"<<num_of_stocks<<'\\n';
```

So, it basically generates a random number with the given probability using the srand function and according to the random number the stock price is initiated and with the given condition it proceeds further. Then, I calculated number of simulations, sample mean variance to use them inside the questions to answers.

```

double stockprice::success_rate(std::vector<double> &arr,
double len, double oppsite) {
    int larger = 0;

    for (int i = 0; i < len; i++)
    {
        if (arr[i] > oppsite)
        {
            larger++;
        }
    }

    double total_number_of_simulations = len;

    double success_rate;
    success_rate = (larger / total_number_of_simulations)*100;
    return success_rate;
}

```

This part of the code mainly determines the success rate which takes a parameter of array and two double values. Then to get the success rate we just divide it by total number of simulations and multiply by 100 to get the answer.

The code has been done in C++ and attached separately.