

TIØ4116, Exercise 11.

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Task 1

demand: $B(n)$, for $n=1\dots N$, travel cost: $t(n)=\text{fuel}+\text{time}(n)$, total cost: $T(n)=n*t(n)$,

A While n_0 is larger than n we get a negative number of the second part of the cost function. We cannot have negative cost and therefore eliminates all negative possibilities by saying that the cost is fixed at $n=0$.

B When n increases with 1, the additional cost for all cars are: $((n+1)-n_0)^2)n$

C By plotting the significant part of the cost function we get a parabola. Interpreting the parabola we can see that increased traffic gives exponential increase in costs. But as we don't know anything about the capacity of the road, or the size of the minimum cost. And we cannot say anything about the practical value of 1 money in this case.

Task 2

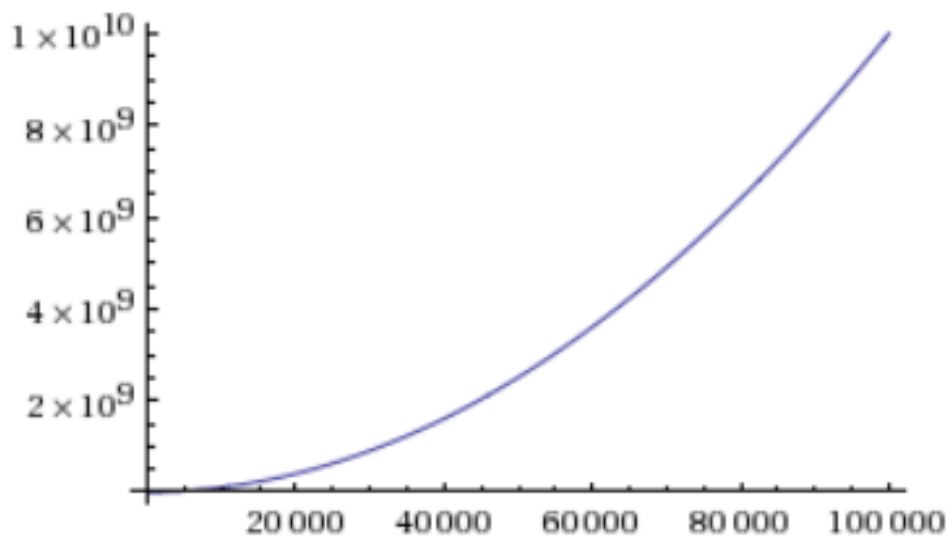
A 1: 20mill in values. 2: minus 10 mill in values.

The chance of getting either is 0.5. Then the sales value now will be estimated to $20-10=10$. The expected max return minus the expected minimum return gives us the average expected return. Which can be seen as the expected sales value.

Input interpretation:

plot	$(-1 + n)^2$	$n = 0$ to 100 000
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Plot:



The figure shows the increase in cost per car given the amount of other cars on the road.

B Guaranteed government backing. The minimum of value of the company is zero. Which in turn increases the expected value of the company to 20 mill.

The government still have to expect to pay 10 million, as that is the guaranteed amount. Debt goes down, shares goes up.

C If the 80% debt is converted to shares the perceived value of the company is increased to 100 mill.

D When the loans are converted to shares and the loaners collect interest the value of the original share decrease.

E Converting the debt into shares without government backing does not change the value of the company.

F

Task 3

A The director should choose the 120 share value. This gives the best potential for reward.

B The director will choose options. Options is the safer choice for long term investments in this case.

C