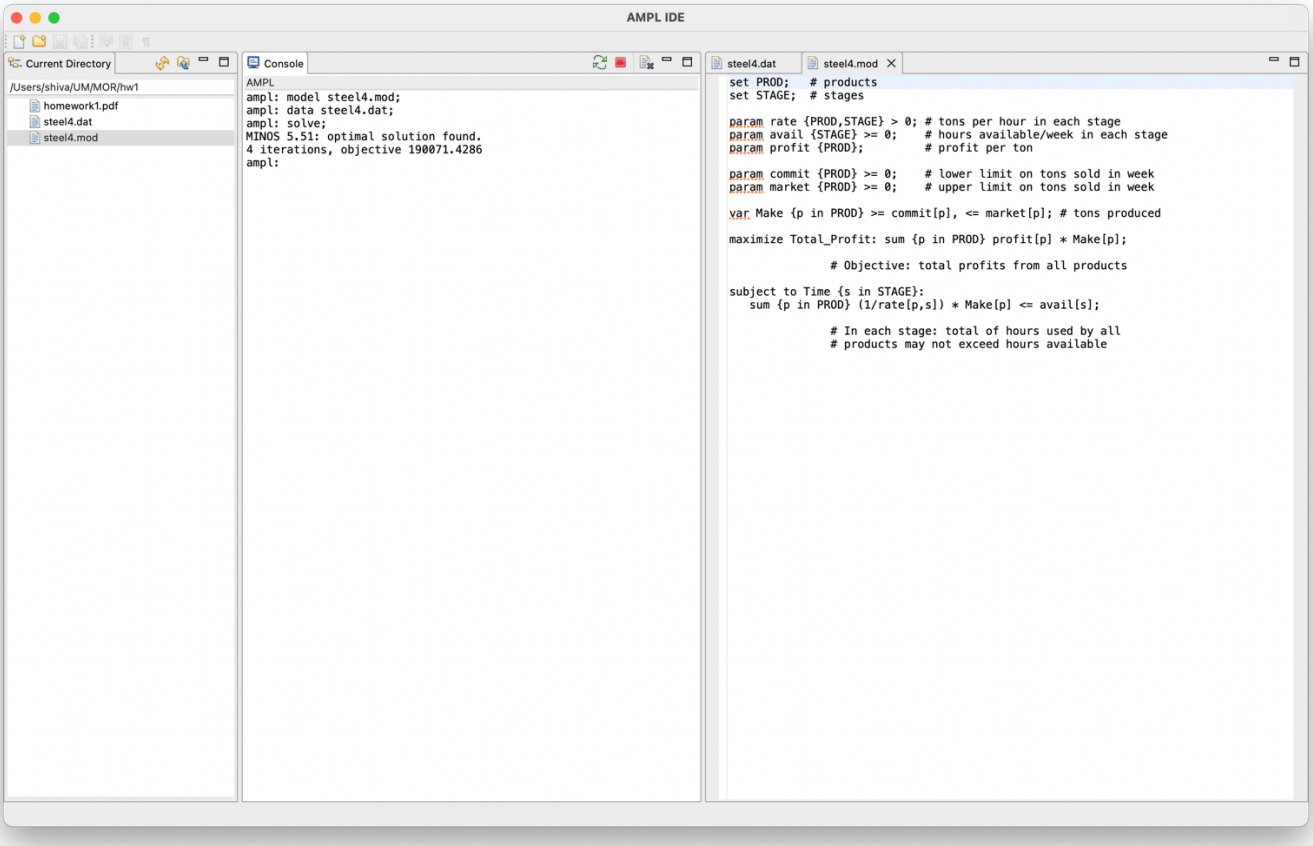
Homework-1

1.

a. AMPL Software installed on the local folder called Desktop

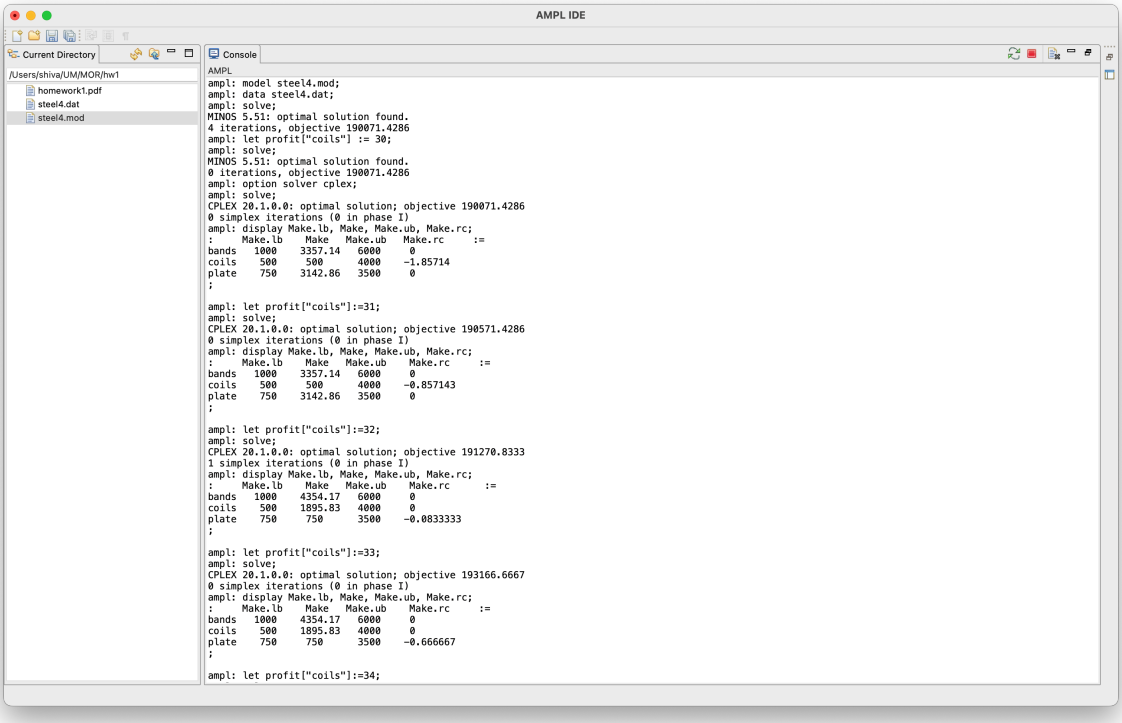


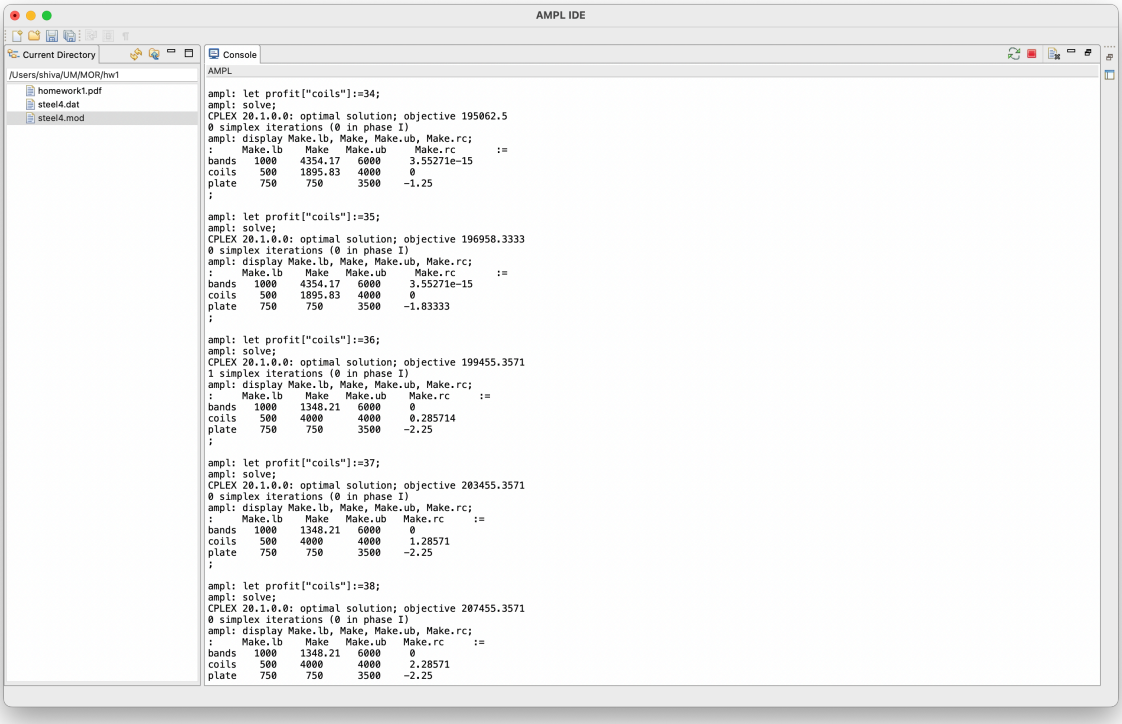
The optimal objective value should be reported as 190071.4286. accurately matches with the above AMPL prompt output.

Homework-1

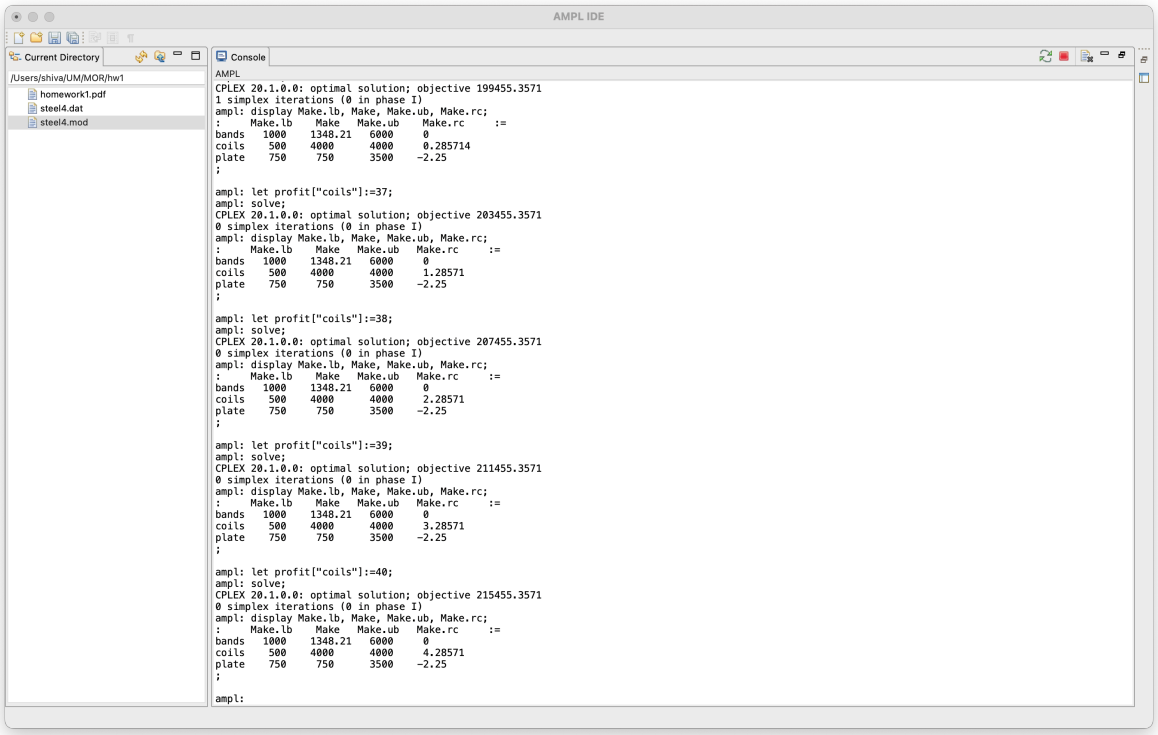
2.

a.



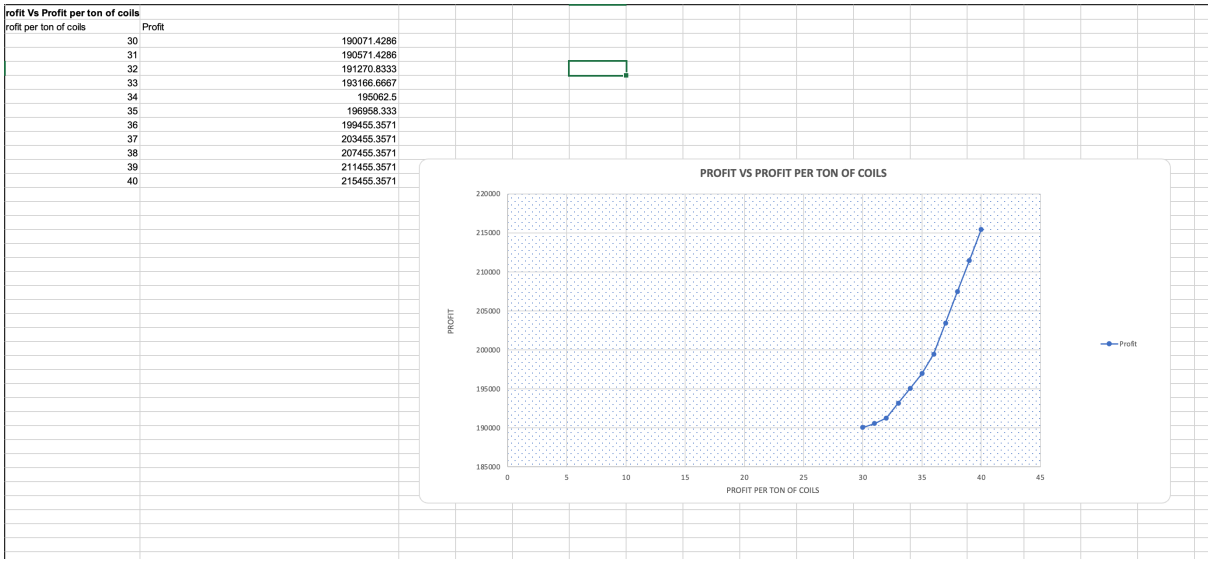


Homework-1



As we can see, the output of coils surpasses 500 and rises to 1895.83 following a $2 increase in the profit per ton of coils. The manufacturing of coils now rises to 4000 after a $4 increase. As a result, we see that the connection between coil production and profit per ton of coils is linear.

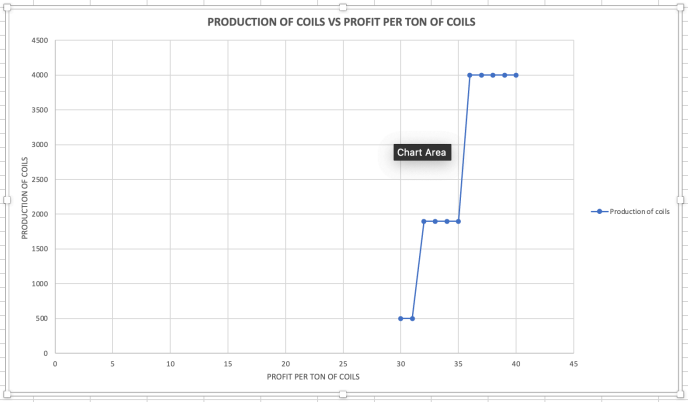
b) Solution:



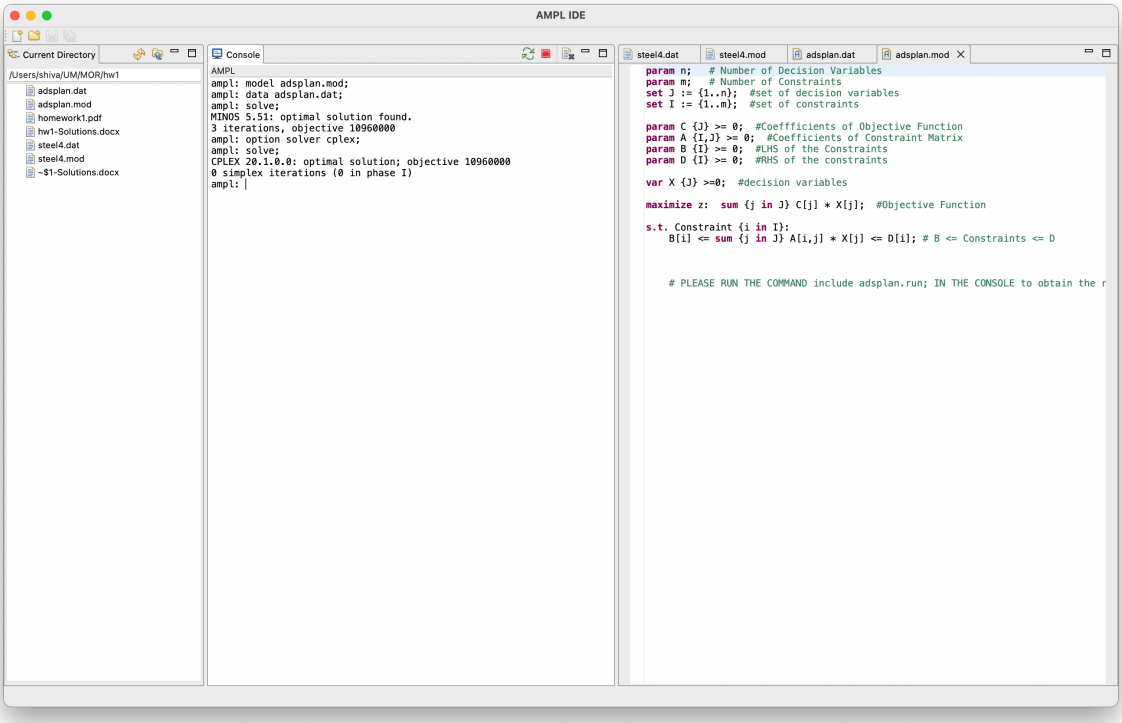
Homework-1

oduction of coils Vs Profit per ton of coils

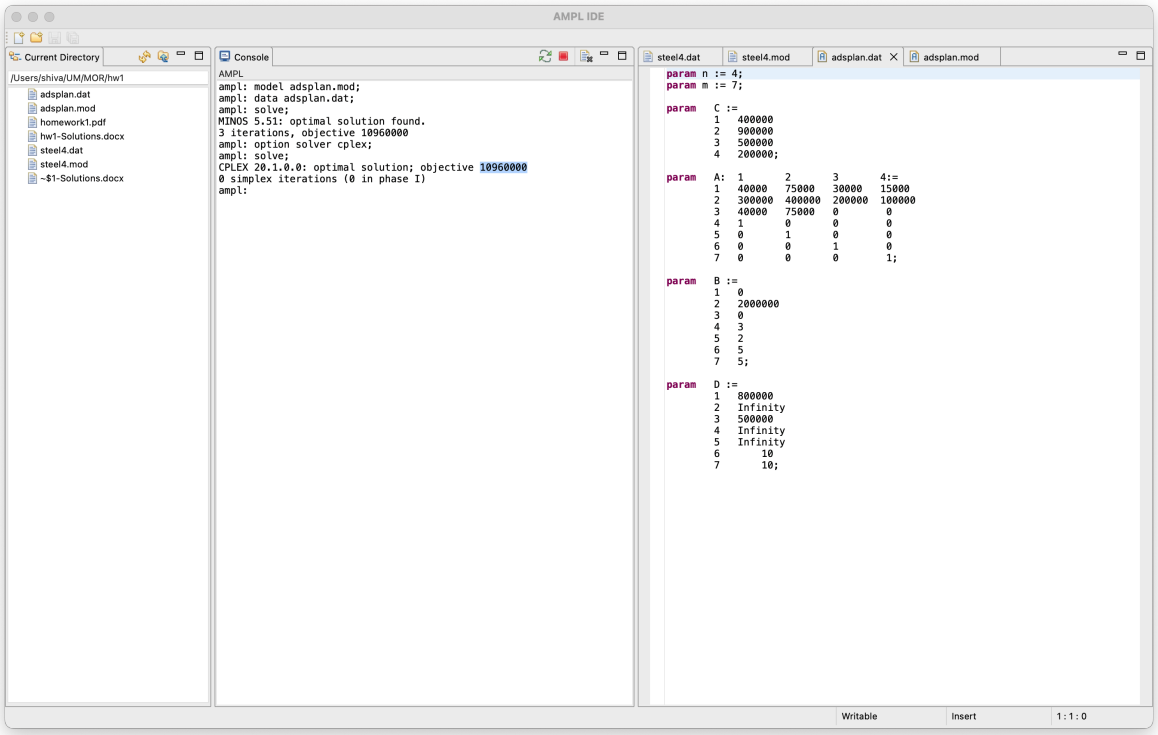
ofit per ton of coils	Production of coils
30	500
31	500
32	1895.83
33	1895.83
34	1895.83
35	1895.83
36	4000
37	4000
38	4000
39	4000
40	4000



3.
Solution:



Homework-1



The optimal objective value should be reported as 10960000

Let the amount of advertising units purchased for radio, magazines, daytime television, and prime time television, respectively, be x1, x2, x3, and x4.

All potential clients who were contacted (in thousands)= = $400x_1 + 900x_2 + 500x_3 + 200x_4$

These factors illustrate how the advertising budget is constrained=

$40{,}000x_1 + 75{,}000x_2 + 30{,}000x_3 + 15{,}000x_4 \leqq 800{,}000$.

The limitation on the proportion of female clients who are reached by the advertising campaign is as follows=$300{,}000x_1 + 400{,}000x_2 + 200{,}000x_3 + 100{,}000x_4 \geqq 2{,}00{,}000$.

the following are restrictions on television advertising= $40{,}000x_1 + 75{,}000x_2 \leqq 500{,}000$

$x_1 \geqq 3$

$x_2 \geqq 2$.

Since radio and magazine advertising units should range from 5 to 10, the following restrictions apply

$5 \leqq x_3 \leqq 10$

$5 \leqq x_4 \leqq 10$.

The complete linear programming problem with some minor simplification

Is given below:

Homework-1

The full linear programming issue is provided below with some slight simplifications:
Maximize=Z = 400x1 + 900x2 + 500x3+ 200x4
Subject to:40x1 + 75x2 + 30x3 + 15x4≦ 800
30x1 + 40x2 + 20x3 + 10x4 ≧ 200

$40x_1 + 75x_2 \leqq 500$

x1≧ 3
x2≧ 2
x3≧ 5
x3≦ 10
x4≧ 5
x4≦ 10