APS 502 Project Assignment Fall 2018 PART 1

Due Dec. 5, 2018 by noon. Slide your assignment under my office door MC 320. Note: You must use MATLAB for the project and must include the code, data, and output in MATLAB in an appendix. You must write up the formulation for each part and show results of solving the model using tables or graphs with reasonable formatting (please do not just give me the dump of the computational output from MATLAB, this as mentioned should go in an appendix). Making your report readable is VERY important and is part of the mark for this assignment.

Part 1

A small pension fund has the following liabilities (in million dollars):

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9
24	26	28	28	26	29	32	33	34

It would like to construct a dedicated bond portfolio. The bonds available for purchase are the following:

Bond	1	2	3	4	5	6	7	8
Price	102.44	99.95	100.02	102.66	87.90	85.43	83.42	103.82
Coupon	5.625	4.75	4.25	5.25	0.00	0.00	0.00	5.75
Maturity year	1	2	2	3	3	4	5	5

Bond	9	10	11	12	13	14	15	16
Price	110.29	108.85	109.95	107.36	104.62	99.07	103.78	64.66
Coupon	6.875	6.5	6.625	6.125	5.625	4.75	5.5	0.00
Maturity year	6	6	7	7	8	8	9	9

Formulate an LP that minimizes the cost of the dedicated portfolio, assuming a 2% reinvestment rate. Solve the LP using your favorite software package.

NOTE: You must use MATLAB as “your favorite software package”

Define all variables and explain all constraints. Please highlight the optimal decisions and objective function values clearly in your report.