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Homework 5

- The maze has no loops and only leads one way from Entrance to Exit, indicating a directed acyclic graph (DAG). The hallways can represent edges and corners with the bag of gold vertices. The best algorithm for this scenario is topological sort. An array can be initialized for the maximum gold collected starting at the entrance as 0. Moving through, the nodes in topological order with their weight can be incremented until exit is reached with the maximum gold.

- Dr. Amargus' claim that order doesn't matter for constructing an AVL tree is wrong. The following example with 13, 22, and 36 will prove he's wrong:

13, 22, 36 22 36, 22, 13 22
 with rotation 13 36 13 36
 22, 13, 36 22
 13 36 no rotations

- To find the hash table, we first need to input the keys and calculate the values:

$(3 \times 12 + 5) \bmod 11 = 8$, $(3 \times 44 + 5) \bmod 11 = 5$, $(3 \times 13 + 5) \bmod 11 = 0$,
 $(3 \times 88 + 5) \bmod 11 = 5$, $(3 \times 63 + 5) \bmod 11 = 8$, $(3 \times 96 + 5) \bmod 11 = 1$, $(3 \times 11 + 5) \bmod 11 = 5$,
 $(3 \times 80 + 5) \bmod 11 = 1$, $(3 \times 20 + 5) \bmod 11 = 10$, $(3 \times 16 + 5) \bmod 11 = 9$, $(3 \times 5 + 5) \bmod 11 = 9$

Index	chained	Index	chained
0	[13]	9	[16, 5]
1	[96, 39]	10	[20]
1	[]		
5	[]		
4	[]		
5	[44, 88, 11]		
6	[]		
7	[]		
8	[17, 23]		