

COMP517 Assignment 10

(Worth 25% of the module marks)

In this exercise you are asked to add more features to the adventure game you have been working on.

Start by creating an 8x8 warehouse, using the code you developed for Assignment 8. (If you could not get anything working for that assignment, you may instead set up an 8x8 array in which you are free to wander from a room into any neighbouring room. However, you will lose marks for doing this).

Next, randomly scatter 50 items around the warehouse. Some rooms will have no items, while others may end up with several, so use a LinkedList to contain the items in each room.

Each item has a name (String), a size (int), and a value (int). The names should be read in from a file at the start of the game. The size should be a random integer in the range 5-15, and the value should be a random integer in the range 1-20.

Your hero has a backpack of capacity 50. The contents of the pack are represented as a linked list, initially empty. This list is constantly maintained in ascending order of item size.

At the start of the game, the hero is dropped into a random room. You then have the following single-letter commands available to you:

n, e, s, w : head north, east, south or west, assuming there is a door allowing it

i : inventory – list all items in your backpack

p : pick up item

d : drop item

In the case of the 'p' and 'd' commands, the program should give you a list of items to select from.

The aim of the game is to maximise the total value of all the items in the hero's backpack. (NB. This is a modified form of a classic problem in computer science, known as the knapsack problem).

Good luck!

MARKING CRITERIA

Program correctness and approach: 60%

Documentation (commenting and report): 15%

Program style (e.g. layout): 10%

Testing: 15%

SUBMISSION

As usual, submit your program, test data and output electronically. Include a brief report to explain your approach. **The deadline for submission of your solution is 12 noon on Monday December 11.**

SAMPLE RUNS

Starting the game ...

You are in room (3, 6)

There is a door going east

There is a door going north

There is a golden orb here (size 11, value 9)

There is a magic key here (size 8, value 12)

What would you like to do? **p**

OK. Here are the items you can pick up:

1: golden orb (size 11, value 9)

2: magic key (size 8, value 12)

Which item would you like? 1

OK. Item taken.

What would you like to do? **p**

OK. Here are the items you can pick up:

1: magic key (size 8, value 12)

Which item would you like? 1

OK. Item taken.

What would you like to do? **i**

Here are the items in your backpack:

1: magic key (size 8, value 12)

2: golden orb (size 11, value 9)

Total worth of items is 21

Space left in your backpack is 31

What would you like to do? **w**

You can't go that way.

What would you like to do? **n**

You are in room (2, 6)

etc.