Banks Cargill

Design:

The concept behind my game is a simple dungeon crawler based on someone dreaming. This isn’t made aware to the user until the game is won.

The player starts the game in a room at the end of a hallway, confused as to how they got there. A booming voice gives them directions on what they have to do to return home.

The goal of the game is to find a “key”(a gem) and answer the voices riddles (2 of them).

The player has 8 turns (“hours”) to accomplish the goal.

The player will have 5 choices for each round:

1. Look around (interact with space)
2. Move to an adjacent space (pointer manipulation)
3. Print list of items (use doubly linked list)
4. Print remaining steps (each move to an adjacent space counts as a step)
5. Quit the game

Here is a simple diagram to show the linked spaces

HALLWAY

ENTRANCE

INTERSECTION

TROPHY ROOM

SNAKE PIT/DARK EERY ROOM

PUZZLE ROOM

Required items:

1. Need torch from hallway to get across snakepit
2. Need gem (key) from snakepit to access the puzzle room

Puzzles/Riddles:

1. In a certain country ½ of 5 = 3. If the same proportion holds, what is the value of 1/3 of 10 ?

Answer: 4 (5/2 = 3 | 5=6 | 5/3 = 2 🡪10/3 = 4)

1. What digit is the least frequent between the numbers 1 and 1,000 (0-9)

Answer: 0

Design:

Space class:

Use class to create a game with the structure of linked space…

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| Protected:  Space objects that point North, west, east south  String name  Integer ID |
| Public:  Constructor and destructor  Return funtions for adjacent space in each direction  Return function for name and ID  Pure virtual functions:  Interaction |

Classes derived from space: Entrance, Hallway, intersection, snakepit, trophy room, puzzle room

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| Protected: |
| Public:  Constructor and destructor  Declare name and ID  Virtual Interaction function  Determines what happens if you choose to interact in the room  Interactions based on items in each room |

Backpack class:

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| Private:  Structure for double linked list (can contain 3 items)  Integer numItems |
| Public:  Constructor and destructor  addItem  printItems  searchItems |

Player class: Game runs through this class

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| Private:  Pointers to space objects to create linked game structure  Pointer of type backpack  Integer for steps remaining  Functions for printing remaining steps and moving spaces |
| Public:  Constructor and destructor  Create new space objects, point each correctly to set up the linked game structure, set current space  playGame function  menuIntro()  While (exitGame = false, stepsRemaining>0 , objects not in bag)  displayGameMenu  Switch statement for choice  If (objects in bag) {do this}  Else if (steps remaining<=0){do this}  Else (user chose to exit game){print exiting game} |

Game menu

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| Function to display the menu choices at each step |

**Testing:**

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| **Test Scope** | **Description** | **Expected Results** | **Actual Results** |
| Player.cpp  Constructor/destructor  Playgame()  Entrance.cpp | Created main and tested my player.cpp functions (excluding move) with just the one space (entrance) | Prints intro, menu choices, interaction, and quit | Works as intended. Just needed to do some aesthetic changes |
| Hallway/player.cpp move function | Testing to see if hallway is implemented correctly and if the move function works | Able to move to hallway, able to add torch as item | Had some trouble with the move function. Had created a space pointer that I didn’t need and it was causing a segmentation fault |
| Backpack (in above test) | Testing for print functionality of items once the above test functions as expected | Prints 1. Torch | Works as expected  I am getting a warning that a pointer is used uninitialized that I need to look into |
| Intersection.cpp | Testing interaction in intersection | Nothing to interact with | Works as intended |
| Snakepit.cpp | Testing interaction in snakepit  With torch  Without torch | Able to cross pit and acquire gem  Death… | Works as intended.  Had to rethink the way I was doing this. Ended up adding item called snakebite and exiting while loop in player to deal with this death |
| Trophy room | Testing interaction in trophy room | Nothing to interact with | Works as intended |
| Puzzle room | Testing interaction in puzzle room  With gem:  Without Gem: | Able to access the final riddles.  Nothing to interact with | Works as intended  Works as intended |
| Puzzleroom riddles | Testing to be sure that entering the correct answers allows you to win the game.  Testing to be sure that entering the incorrect answer to either riddle makes you lose the game | WIN!  Lose… | Works as intended  Works as intended |
| Death by stepcount | Intentionally run out of steps | Death | Works as intended |
| Valgrind | Run through the game a few times with different interactions chosen to test my destructors and for leaks/unfreed memory | Hopefully at this point I have gotten good enough with pointers and deleting new that I won’t have issues | Works as intended! |