

Jäger: The Hunt for Crazy Gert's Gold!



1. Background

In the late 1800s, the crazy Baron Gert Lotz von Wallroth, a wealthy bachelor of impeccable taste, lived on an eight-hectare estate. The townspeople of Wallroth called him "crazy" because of his obsession with cats. In fact, it was rumored he had no less than 500 cats on his estate! The Baron was somewhat of a recluse, and so not much is known about how wealthy he really was, nor exactly how many cats he owned.

As the years passed, Baron Lotz became obsessed with what would happen to his wealth after his passing into the next world. Having neither heir, nor relatives (that he much cared for, anyway), and even fewer friends, he decided he would hide his riches from the rest of the world. It is rumored that he constructed a labyrinth on his property in which to hide his gold and other riches. Furthermore, it is said that, shortly before his death, the Baron sealed his cats inside the labyrinth to "protect" his riches. Now, more than 100 years hence, the existence and exact location of the Baron's fabled labyrinth have still not been verified.

2. The Game

Having just graduated from college, and with little else to occupy his time, our hero, Hedi, has decided to try to solve the mystery of Crazy Gert's Gold. He will either get rich from the finds he makes, or die trying!

Hedi first heard about Crazy Gert while doing his IQP at the Project Center in Frankfurt, Germany. While there, he worked at a financial institution (N.B. Frankfurt is the banking center of Europe) on a project to design a multilingual user interface for clients from various European countries. This is not really important for the game though.

3. The Assignment

You will write code to provide a first-person experience for our hero, Hedi, to explore Crazy Gert's labyrinth. Armed only with a flashlight (isn't that the way it *always* is in horror games?), Hedi must navigate through the dark maze of passages, collecting **gold pieces**. The goal is for Hedi to collect as many gold pieces as he can, and then to exit the labyrinth.

4. Jellybeans

Hedi loves **jellybeans**, and carries an unlimited supply with him. As the labyrinth can get quite confusing, Hedi has decided to drop jellybeans in order to help him remember his way. He only has red, green, and blue jellybeans, and uses one color to help him find his way back out of the labyrinth, and another to mark areas where he has already been (*e.g.*, dead ends). Then, when he walks into a new part of the labyrinth, if there is a jellybean there, he knows he has been there before. When it is time to leave the labyrinth, he just needs to follow the trail of appropriately colored jellybeans. To remove a jellybean from a cell, Hedi must eat the one off the ground (YUCK!).

5. Ghoulies

Because most of the cats (if there ever were any cats) have been dead for more than a century, Hedi will need to avoid any Ghoulie remnants of their existence.

Throughout the duration of the game, the Ghoulies will move about the labyrinth in a pseudo-random manner. The only constraints on Ghoulie movement are that they can only move one cell at a time, and that no two Ghoulies can occupy the same cell. Therefore, Ghoulies will adjust their movements to avoid other Ghoulies. Of course, these are spirits, so walls do not get in their way. They cannot, however, leave the labyrinth.

If a Ghoulie appears in front of Hedi, he must throw three jellybeans in the proper color order for that Ghoulie. Each Ghoulie has a three-tuple associated with it, denoting the order that jellybeans must be thrown in order to appease it. Once appeased, the Ghoulie can finally rest in peace, and disappears forever. For example, if a Ghoulie with the triple $\langle R,R,G \rangle$ appears, Hedi must throw a red jellybean, followed by another red jellybean, followed by a green jellybean, and the order matters. This must be done quickly; otherwise the Ghoulie steals some pieces of gold from Hedi, and

disappears into an adjoining cell of the labyrinth. The gold pieces stolen by the Ghoulie are magically redistributed to a random cell in the labyrinth.

6. Glowing Mushrooms

The labyrinth is a damp place, just perfect for mushrooms to grow! There are two types of mushrooms that grow in the labyrinth, good ones and bad ones. Unfortunately, they look identical. If Hedi comes across a mushroom, he can pick it up, or leave it alone. Good mushrooms repel Ghoulies, and bad mushrooms (you guessed it!) attract Ghoulies. If he picks up a good mushroom, Ghoulies will choose to move away from Hedi, and any Ghoulies that are in a cell Hedi enters will flee. If Hedi picks up a bad mushroom, however, Ghoulies within a certain range of Hedi will go towards him. The power of the mushrooms only lasts for a few seconds. If Hedi picks up another mushroom while already holding one, it replaces the first one, and the clock starts again. Once a mushroom is picked up, it cannot be dropped.

7. The Labyrinth

The labyrinth consists of a grid layout of $M \times N$ cells. The list of possible cells (**Figure 1**) is made up of types of passages that fit together to form a "legal" labyrinth.

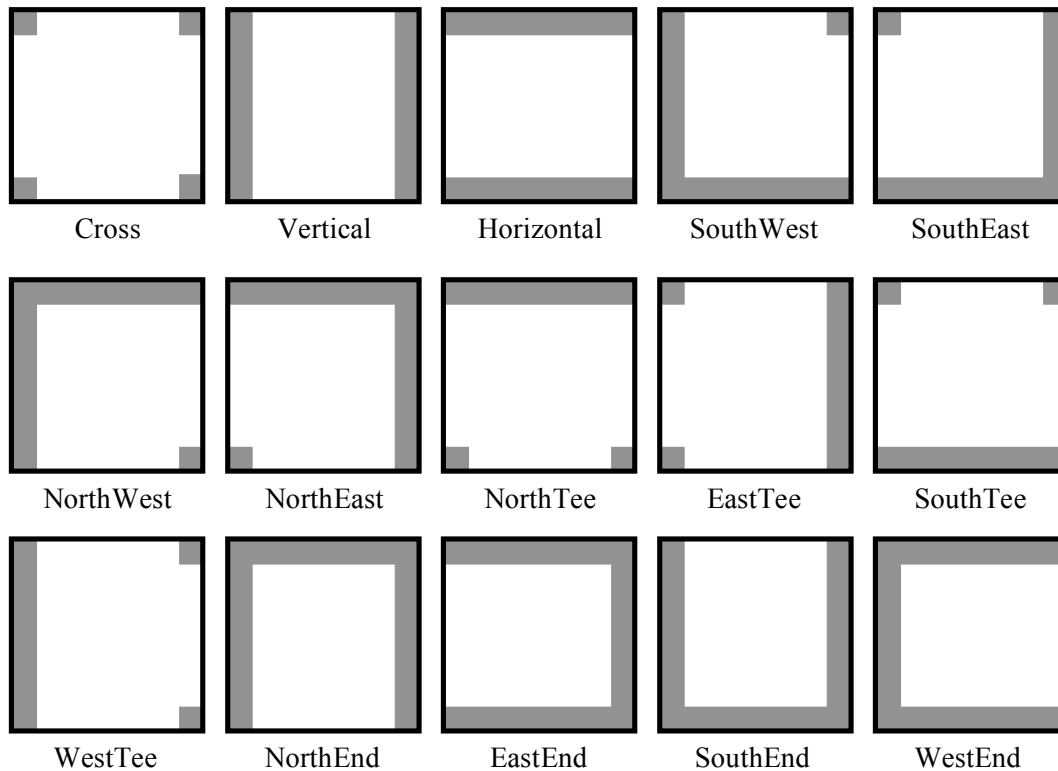


Figure 1: Legal cells.

Each time a new game is started, a random number seed will be used to randomly generate the layout of the cells. Each cell must be reachable from every other cell. One edge cell is randomly chosen to be the labyrinth entrance/exit.