

# An Algorithm for Quests

An algorithm is a set of specific steps or instructions for solving a problem. For example, there are algorithms to sort numbers, compute mathematical results, and render images.



ANN STARTED TO PANIC as she packed for her quest. How was she going to find the answer and save the kingdom? She rarely traveled out of the capital city, and even then she had never gone beyond Millington. Now she had to search all the known lands for a way to save the kingdom. It quickly dawned on her that she had no idea what she was doing.

Her thoughts were interrupted by a sharp knock on the door. Sir Galwin stood rigidly at the entryway, looking mildly uncomfortable.

"Sir Galwin," Ann greeted him cautiously. He had been sulking since Ann had received her quest, and she was afraid of setting him off again.

"I came to wish you luck," Sir Galwin offered. "I'm sure you'll be successful in your quest."

"Thank you," replied Ann.

The knight nodded a stiff acknowledgement and turned to leave.

"Sir Galwin, do you have any advice for me?" asked Ann before he could go.

The knight turned back toward Ann. From the wide smile on

his face, Ann knew that she had asked the right question. Sir Galwin loved to share his stories about quests almost as much as he loved questing itself.

"Follow the established algorithm for quests, and you'll be fine," Sir Galwin assured her.

"An algorithm?" asked Ann. She had never heard of an algorithm for quests. Hope flowed through her. She could handle algorithms.

"It's simple," started Sir Galwin. "If you have one or more leads, you follow the best one. Otherwise, if you don't have any leads, you travel to where you can find more information. Break any ties by flipping a coin."

This advice surprised Ann. She didn't know what she had been expecting, but this certainly wasn't it. It took her a few moments to figure out how to voice her confusions.

"This approach seems to involve a lot of guessing," ventured Ann.

"I prefer to think of it as a heuristic," said Sir Galwin.

"A heuristic is basically an educated guess—a rule of thumb, if you prefer," said Ann. "Is there anything more exact? Something without any guessing, perhaps? Something that guarantees that I find a solution quickly?"

Sir Galwin let out a deep throaty laugh. "I said the same thing when my mentor described this approach to me. I resolved to develop a better algorithm for solving all quests."

Ann waited for him to continue, but Sir Galwin appeared to be watching a pigeon outside her window. As far as Ann could tell, the pigeon was not doing anything particularly interesting. It paced along the window ledge, bobbing its head.

"Did you?" she finally asked.

"What? Oh. The algorithm. No. I never invented anything better. I eventually realized that the established algorithm was pretty good. It turns out that quests always involve some guessing."

"So my entire plan is to keep following the best lead and collecting new information?" Ann confirmed.

“Yes. I call it the Information Maximization for Issue Resolution algorithm,” said the knight. “I think it sounds much better than what my mentor used to say. He would call it ‘figuring stuff out.’”

“Think of it as a search for an answer. At each step you try to either move closer to the answer or learn more about the problem itself. Hopefully, learning about the problem will help you find an answer.”

“How do I figure out the best lead? How do I figure out where to get more information?” asked Ann.

“You have to find a strategy that works for you,” said Sir Galwin. “I rank things according to a gut feeling. I use 0 to indicate ‘feels utterly normal’ and 10 to indicate ‘feels wrong.’ For me, a 10 feels similar to eating three pounds of refried beans. I also use a special data structure to track everything. That system saved my life hundreds of times. One time, I was hunting a particularly nasty bog dragon through some marshlands—”

“Is there anything else I should know?” interrupted Ann. She was desperate for any more information.

Sir Galwin thought for a moment. Finally, he said, “Avoid chasing bog dragons through marshlands.”

For the twentieth time this hour, Ann wondered what she had gotten herself into.