

Master the Art of Problem Solving with These 5 Techniques

You'll learn how to tackle even the most complex challenges with confidence by mastering these 5 essential problem-solving techniques. Whether you're looking to advance your career, improve your personal relationships, or simply become more inventive, these techniques will help you refine your thinking, streamline your problem-solving process, and achieve your goals.

Decomposition

Break down complicated problems into smaller, more manageable parts to identify patterns and potential solutions. Start with the end goal in mind and work backwards to determine the individual steps necessary to achieve it. With practice, you'll be able to anticipate roadblocks and identify the most efficient path forward.

Steps:

1. Identify the problem.
2. Break the problem down into smaller parts.
3. Identify patterns among the parts.
4. Determine potential solutions for each part.

Example:

Break down a website redesign into separate tasks like wireframing, copywriting, and coding to streamline the process and identify potential obstacles at each stage.

Pattern Recognition

Identify patterns and relationships between seemingly unrelated elements to gain new insight into a problem. Look for similarities in other areas of life or cases you have already solved. This technique can be particularly effective when applied to historical data or complex systems.

"Recognizing patterns is at the heart of mathematics. It's a skill that can be learned and nurtured, and it's something that can be applied to many real-world problems." - Eric Mazur

Abstraction

Ignore irrelevant details and focus on the most important aspects of a problem to simplify it. This technique can be used to create models or frameworks that help to organize and reduce the complexity of a problem. By focusing on simplification, we can more easily understand the underlying mechanisms and generate more creative solutions.

Examples:

Using a graph to visualize data.

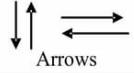
Developing a flow chart to represent a process.

Creating a framework for a business model.



Algorithms

Develop a set of instructions or rules to follow when solving a problem. Algorithms are commonly used in computer programming, but they can also be used to develop more effective problem-solving strategies. By breaking down a problem into a series of steps, we can more easily identify inefficiencies and improve our process for finding solutions.

	Parallelogram	
Process		Any processing to be performed can be represented
Decision box		Decision operations that determine which of the alternative paths to be followed
Connector		Used to connect different parts of flowchart
Flow		Joins 2 symbols and also represents flow of execution
Pre defined process		Modules (or)subroutines specified else where

An example of an algorithm in the form of a flowchart.

```
25
26 def check_db():
27     if not os.path.isfile(FILE_URL):
28         db.create_all()
29
30 @app.route("/")
31 def home():
32     check_db()
33     all_books = db.session.query(Book).all()
34     return render_template("index.html", books=all_books)
35
36 @app.route("/edit", methods=["GET", "POST"])
37 def edit():
38
39     if request.method == "POST":
40         book_id = request.form["id"]
41         book_to_update = Book.query.get(book_id)
42         book_to_update.rating = request.form["rating"]
43         db.session.commit()
44     return redirect(url_for("home"))
```

Coding is one example of a field where algorithms are commonly used.

Evaluation

Test and refine your solutions to identify areas for improvement. Evaluation is an iterative process that involves testing solutions, analyzing results, and refining your approach based on feedback. By carefully evaluating our solutions, we can refine our techniques and develop more efficient problem-solving strategies.

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How to Evaluate Your Solutions:

1. Test multiple solutions.
2. Gather data and feedback.
3. Analyze results.
4. Refine your approach.



Conclusion

By mastering these essential problem-solving techniques, you can become a more creative, effective, and efficient problem solver. With plenty of practice and a willingness to think outside the box, you can tackle even the most complicated challenges and achieve your most ambitious goals.