

Scientific Research Automation

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In the modern science we always depend on some communities' knowledge bases. A person can not know everything and in order to reach success we must use already gained knowledge. When doing any scientific research we always make a lot of repeated work thus trying to automate the routine is a very effective approach.

The most expensive resource in our life is time, because we cannot return it anymore when it went off. So while doing a scientific research we should start from calculating our time resources. We should keep an eye on the clock if we really want to reach success. There are different ways how we could save some time:

- Accurate Planning
- Routine Automation
- Improvement

Of course there are more ways such as choosing another approach or upgrade for a workstation. People usually choose them when they understand that a mistake was made at the preparation step of our scientific research process. And they may require more resources. That's why we must get ready to the process very precisely. And do it before starting work.

Careful planning is very important. There is no need to allocate expensive resources for redundant work. There is a handy expression for this particular case – “Make it work. Make it right. Make it fast. The order is important”. Do not hurry at preparation step, breathe deeply and look around. Usually we have all that we need. Make once - use everywhere. Seek for source documents. Try to understand the problem before making obvious mistakes. This will definitely save your time. However, in some case it is really useful touch the subject manually if something is not clear. But the rule does not change – “Do not hurry”.

But why is automation so important? The answer is on the top – “Automation makes thing easy”. This means that you will need to divide a task into smaller steps while trying to automate your scientific research process. It is impossible not to make a mistake when you have curved node instead of clear chain. Remember a very useful rule – “Divide et impera!”

Let machines work because your aim is not to work at all. Your aim is to think and find solutions. There are different ways of automation approaches. We may always start with simple and smart open source solutions. Anywhere the good idea is to get used to your integrated development environment. Start with simple things and study its common tools and features. It is very important to know common hot keys' combinations. There is a common mistake when we try to find some text on a page just reading the text. We may spend about a minute to look through a large page and still fail to find required part because it is not obvious that there is that text we are trying to find. Imagine how much time you will save using simple 'Ctrl+F' combination on your keyboard.

Think of the routine you do every day. You might need to prepare some kind of test data for your scientific research work. It would be a great idea to make all calculation or data generation in some kind of modeling tool. This approach really saves a great amount of time. There is an excellent tool to start with – Sikuli. When you need a tool to transfer or prepare data you may use Sikuli. It will help you join incompatible parts if using Application Programming Interface is impossible in your case. The simple approach Sikuli uses is keyboard and mouse emulation.

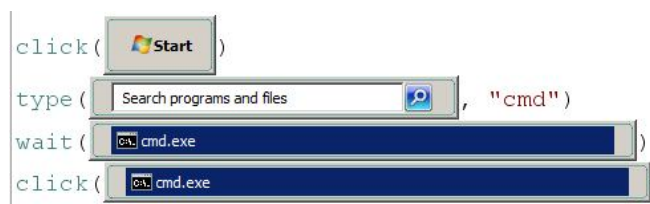


Image 1 – Sikuli script example

And remember that a great success is always made of smaller victories. Try and not give up. Remember Tomas Edison who had not given up even after 2000 failures while trying to find appropriate material for his electric bulb fiber.

List of Sources Used:

1. Hunt A. The Pragmatic Programmer: From Journeyman to Master / A. Hunt, D. Thomas – Lory, Moscow, 2007. – 288 p.
2. McConnell S. Code Complete: A Practical Handbook of Software Construction / S. McConnell – Russian Edition, Moscow, – 2007. – 896 p.