

Реализация индивидуального проекта. Часть 6

Операционные системы

Перегудов А.В.

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Российский университет дружбы народов, Москва, Россия

Информация

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- <https://github.com/magister6239/project>

Вводная часть

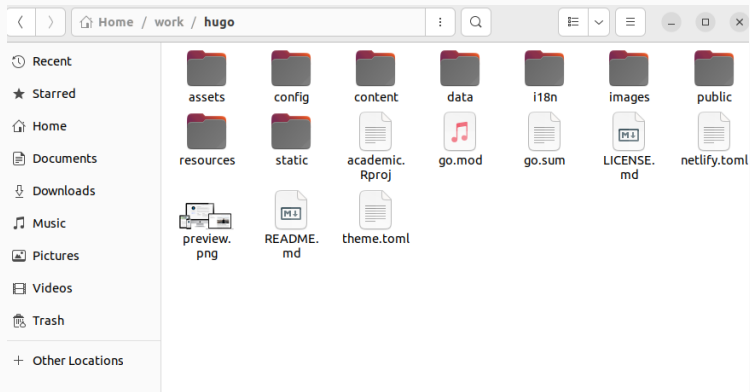
- Создание сайтов является полезным навыком в современном мире.

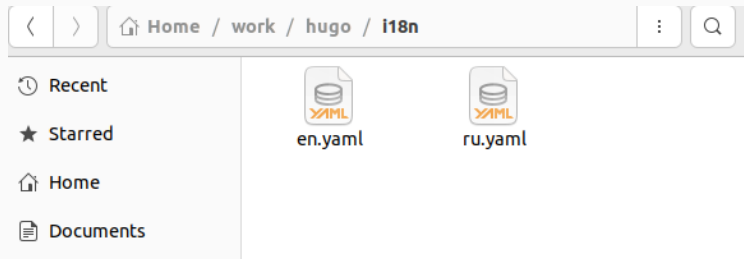
- HUGO
- Устройство многоязычных сайтов

- Сделать поддержку английского и русского языков.
- Сделать пост по прошедшей неделе.
- Добавить пост по теме “Программная архитектура” на двух языках.

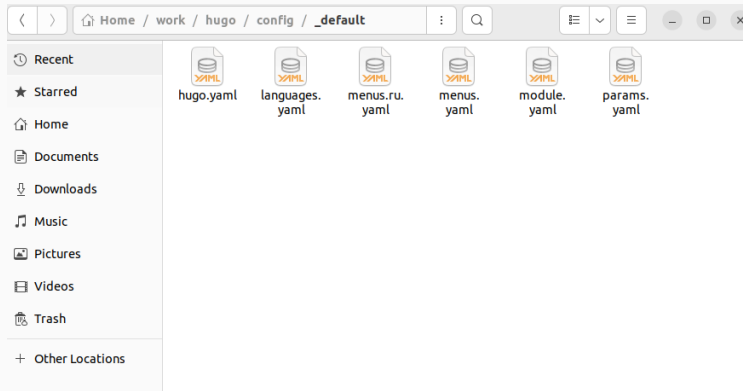
- Процессор pandoc для входного формата Markdown
- Результирующие форматы
 - pdf
 - html
- Автоматизация процесса создания: Makefile

Преднастройка






Преднастройка



Преднастройка

Open  Save

menus.ru.yaml
~/work/hugo/config/_default

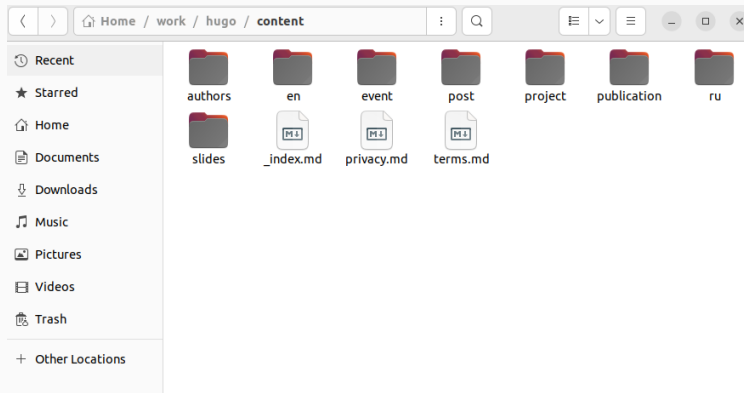
```
1 # Navigation Links
2 #   To link a homepage widget, specify the URL as a hash `#` followed by the filename of the
3 #   desired widget in your `content/home/` folder.
4 #   The weight parameter defines the order that the links will appear in.
5
6 main:
7   - name: Главная
8     url: '#about'
9     weight: 10
10  - name: Посты
11    url: '#posts'
12    weight: 20
13  - name: Проекты
14    url: '#projects'
15    weight: 30
16  - name: Темы
17    url: '#talks'
18    weight: 40
19  - name: Публикации
20    url: '#featured'
21    weight: 50
22  - name: Контакты
23    url: '#contact'
24    weight: 60
25
26 # Link to a PDF of your resume/CV from the menu.
27 # To enable, copy your resume/CV to `static/uploads/resume.pdf` and uncomment the lines below.
28 # - name: CV
29 #   url: uploads/resume.pdf
30 #   weight: 70
```

Преднастройка

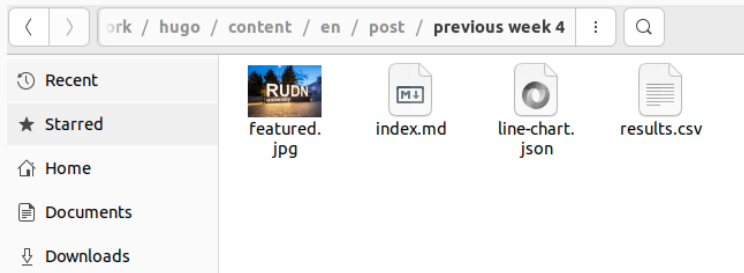
```
languages.yaml
~/work/hugo/config/_default

1 # Languages
2 #   Create a section for each of your site's languages.
3 #   Documentation: https://docs.hugoblox.com/reference/language/
4
5 # Default language
6 en:
7   languageCode: en-us
8   contentDir: content/en
9 ru:
10  languageCode: ru
11  contentDir: content/ru
12
13 # Uncomment the lines below to configure your website in a second language.
14 #zh:
15 #   languageCode: zh-Hans
16 #   contentDir: content/zh
17 #   title: Chinese website title...
18 #   params:
19 #     description: Site description in Chinese...
20 #   menu:
21 #     main:
22 #       - name: 传
23 #         url: '#about'
24 #         weight: 1
```

Элементы сайта на двух языках



Элементы сайта на двух языках

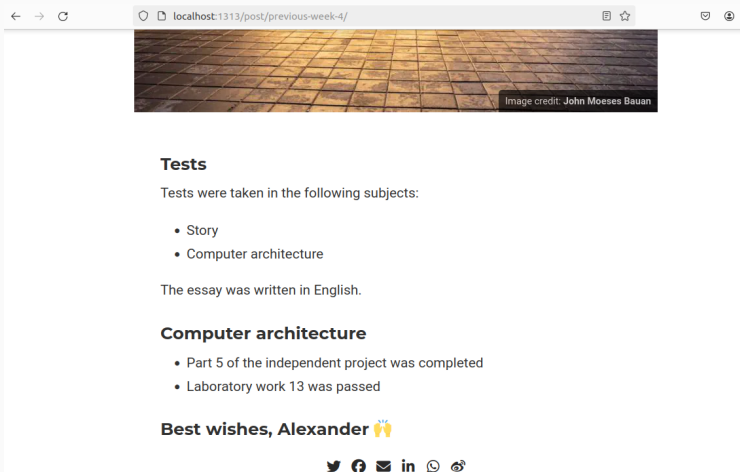


Элементы сайта на двух языках

```
Open ▾  index.md  Save  -  □  ×
~/work/hugo/content/en/post/p...

1 ---
2 title: Previous week blog (4)
3 date: 2024-05-07
4 math: true
5 image:
6   placement: 2
7   caption: 'Image credit: [John Moeses Bauan](https://
8     unsplash.com/photos/OGZtQF8iC0g)'
9 ---
10 ### Tests
11
12 Tests were taken in the following subjects:
13
14 - Story
15 - Computer architecture
16
17 The essay was written in English.
18
19 ### Computer architecture
20
21 - Part 5 of the independent project was completed
22 - Laboratory work 13 was passed
23
24 ### Best wishes, Alexander 🙌
```


Элементы сайта на двух языках



Элементы сайта на двух языках



Элементы сайта на двух языках

```
Open  [icon] index.md ~/work/hugo/content/en/post/Scientific Programming languages Save [icon] [icon] [icon] [icon] [icon]
1 ---
2 title: Scientific programming languages
3 date: 2024-05-07
4 math: true
5 image:
6   placement: 2
7   caption: 'Image credit: [**John Moeses Bauan**](https://unsplash.com/photos/OGZtQF8lC0g)'
8 ---
9
10 Alexander Nozik, physicist and programmer, head of the Nuclear Physics Methods Laboratory at JetBrains Research, deputy head of the
    Laboratory of Methods of Nuclear Physics Experiments and master's program at MIPT - about how to transfer scientific code to a
    modern stack and why it is difficult to introduce new tools into science. This article is based on a December 2021 episode of
    Skillbox's People and Code podcast.
11
12 ### – Alexander, tell us what you do and what problems you solve?
13
14 – My main place of work is the Moscow Institute of Physics and Technology (MIPT), also known as Phystech. In addition, I work at
    the Institute of Nuclear Research of the Russian Academy of Sciences and JetBrains Research - this is a community of laboratories
    associated with JetBrains. The company supports laboratories and thus gathers the scientific community around itself.
15
16 I am engaged in neutrino physics, this is the main direction of my scientific activity. But in recent years I have been developing
    more software and libraries for scientific research.
17
18 ### – How does science differ from commercial development in terms of tasks? How does this affect the choice of tools and
    programming languages?
19
20 – Science has always been and remains “faster, higher, stronger” than other spheres. Scientists often solve the same problems as in
    commercial development, but on a much larger scale. Let's remember the Internet protocol HTTP: it was originally created so that
    scientific centers could exchange large amounts of data. In one of the corridors of CERN there is even a sign: “The Internet was
    invented in this room.”
21
22 In particle acceleration experiments at the Large Hadron Collider, if memory serves, 25 GB of data are generated per minute. For
    commercial projects this is simply incomprehensible. We work with volumes of data that are not available anywhere else.
23
24 Data analysis and so-called Data Science have already become part of the industry. “So-called” because there is still no clear
    definition of what kind of science this is. Nevertheless, all the methodology and new tools are developed by scientists, because
    only they can operate with complex mathematical models.
25
26 An important feature of science is that there are very few professional programmers in it. Therefore, the tools that scientists use
```

Элементы сайта на двух языках

```
Open  index.md  Save  -/work/hugo/content/en/post/Scientific Programming languages
definition of what kind of science this is. Nevertheless, all the methodology and new tools are developed by scientists, because
only they can operate with complex mathematical models.
25
26 An important feature of science is that there are very few professional programmers in it. Therefore, the tools that scientists use
must not only be the most flexible and fastest, but also simple. Otherwise, non-programmer scientists will create such a thing that
no one will be able to figure it out later. Actually, something similar has already happened in physics, and now the scientific
community is solving this problem.
27
28 The fact is that physicists write computational code in C++, and then wrap it in Python code. And it seems to me that this approach
has outlived its usefulness: in Python it is very difficult to maintain a large code base, and here the size of projects is growing
precisely on the side of the users of the code - scientists. Therefore, such systems are slowly falling apart and over the past
five years, engineers and scientists have been looking for more flexible and simpler alternatives.
29
30 ### – Do other sciences use the same combination of languages?
31
32 – Yes, it's about the same everywhere, but with a slight difference. For example, bioinformatics as a separate field has emerged
relatively recently. Unlike physicists who had to "switch" to Python, they immediately began working in modern languages. But most
sciences still use C, Fortran and C++ libraries, and write a Python add-on on top of them. And now there are the same problems with
flexibility.
33
34 In addition to Python, in various fields of science they write or have tried to write in other languages.
35
36 R. It is used in statistics. It is a highly specialized language that is great for solving statistical problems. But often we need
not only to receive data, but also to create a web service so that the user has access to this data. Writing it in R is not easy.
37
38 Julia This is quite an interesting language with many design features. Try it if you lack speed or flexibility in Python. However,
Julia also has a drawback: its set of tools is still unstable.
39
40 Julia придумали как альтернативу Python и MATLAB. Последний до сих пор используют, но это проприетарная, «неживая» система. Как
только вы выходите за рамки привычных задач, то сразу ощущаете его ограниченность.
41
42 Julia was invented as an alternative to Python and MATLAB. The latter is still used, but it is a proprietary, "non-living" system.
As soon as you go beyond your usual tasks, you immediately feel its limitations.
43
44 Swift. They also tried to make Swift a universal language, but it never went beyond iOS. And then Kotlin appeared, which in syntax
is very similar to Swift, but at the same time is suitable for solving a wider range of problems and allows you to work with
libraries from Java, JavaScript and C.
45
46 Java. I used to program in Java – it's a cool language that is often unfairly criticized. It was created for the enterprise, so
```

Элементы сайта на двух языках

Элементы сайта на двух языках

← → ↺

localhost:1313/post/scintific-programing-languages/

📄 ☆

👤 🌙 🌐

Academic

Home Posts Projects Talks Publications Contact

🔍 🌙 🌐

Scientific programming languages

May 7, 2024 · 7 min read


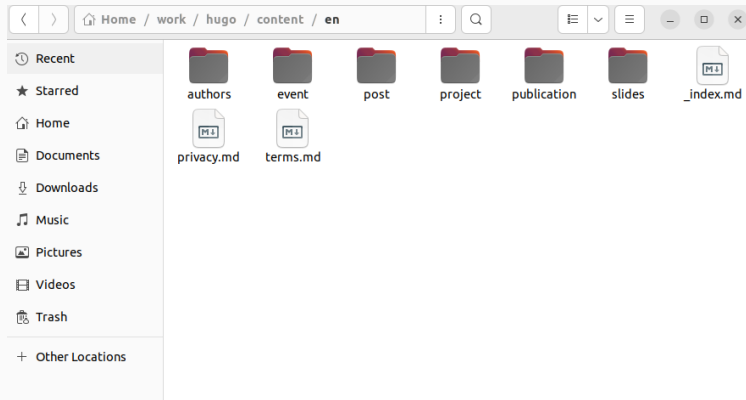


Image credit: John Moeses Bauan

Alexander Nozik, physicist and programmer, head of the Nuclear Physics Methods Laboratory at JetBrains Research, deputy head of the Laboratory of Methods of Nuclear Physics Experiments and master's program at MIPT - about how to transfer scientific code to a modern stack and why it is difficult to introduce new tools into science. This article is based on a December

Элементы сайта на двух языках



Элементы сайта на двух языках

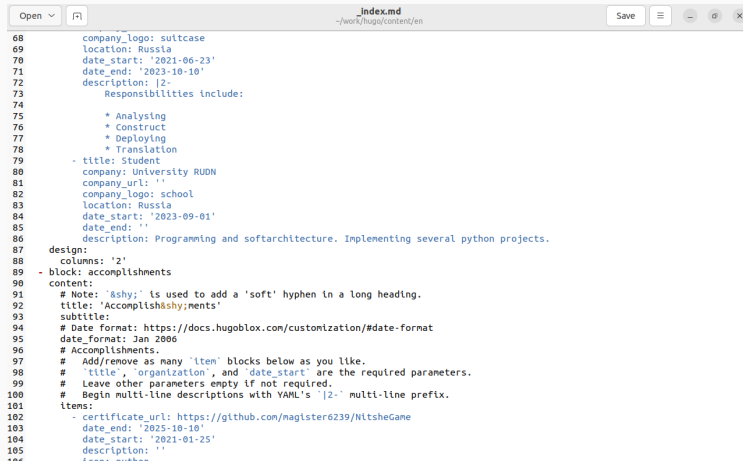
```
Open ▾ [🔍] _index.md ~/work/hugo/content/en Save [≡] [–] [⏮] [⏭] [X]

1 |---
2 # Leave the homepage title empty to use the site title
3 title: ''
4 date: 2022-10-24
5 type: landing
6
7 sections:
8   - block: hero
9     demo: true # Only display this section in the Hugo Blox Builder demo site
10    content:
11      title: Hugo Academic Theme
12      image:
13        filename: hero-academic.png
14      cta:
15        label: '**Get Started**'
16        url: https://hugoblox.com/templates/
17      cta_alt:
18        label: Ask a question
19        url: https://discord.gg/z8wNVzb
20      cta_note:
21        label: >-
22        <div style="text-shadow: none;"><a class="github-button" href="https://github.com/HugoBlox/hugo-blox-builder" data-
icon="octicon-star" data-size="large" data-show-count="true" aria-label="Star">Star Hugo Blox Builder</a></div><div style="text-
shadow: none;"><a class="github-button" href="https://github.com/HugoBlox/theme-academic-cv" data-icon="octicon-star" data-
size="large" data-show-count="true" aria-label="Star">Star the Academic template</a></div>
23    text: |-
24      **Generated by Hugo Blox Builder - the FREE, Hugo-based open source website builder trusted by 500,000+ sites.**
25
26      **Easily build anything with blocks - no-code required!**
27
28      From landing pages, second brains, and courses to academic resums, conferences, and tech blogs.
29
30      <!--Custom spacing-->
31      <div class="mb-3"></div>
32      <!--GitHub Button JS-->
33      <script async defer src="https://buttons.github.io/buttons.js"></script>
34    design:
35      background:
36        gradient_end: '#1976d2'
```


Элементы сайта на двух языках

```
Open  [icon] _index.md -/work/hugo/content/en Save [icon] [icon] [icon] X
33 <script async defer src="https://buttons.github.io/buttons.js"></script>
34 design:
35   background:
36     gradient_end: '#1976d2'
37     gradient_start: '#004ba0'
38     text_color_light: true
39 - block: about.biography
40   id: about
41   content:
42     title: Biography
43     # Choose a user profile to display (a folder name within `content/authors/`)
44     username: admin
45 - block: skills
46   content:
47     title: Skills
48     text: ''
49     # Choose a user to display skills from (a folder name within `content/authors/`)
50     username: admin
51   design:
52     columns: '1'
53 - block: experience
54   content:
55     title: Experience
56     # Date format for experience
57     # Refer to https://docs.hugoblox.com/customization/#date-format
58     date_format: Jan 2006
59     # Experiences.
60     # Add/remove as many `experience` items below as you like.
61     # Required fields are `title`, `company`, and `date_start`.
62     # Leave `date_end` empty if it's your current employer.
63     # Begin multi-line descriptions with YAML's `|2-` multi-line prefix.
64     items:
65       - title: Worker
66         company: YingeComp
67         company_url: ''
68         company_logo: suitcase
69         location: Russia
70         date_start: '2021-06-23'
71         date_end: '2023-10-10'
```

Элементы сайта на двух языках




```
68   company_logo: suitcase
69   location: Russia
70   date_start: '2021-06-23'
71   date_end: '2023-10-10'
72   description: |2-
73     Responsibilities include:
74
75     * Analysing
76     * Construct
77     * Deploying
78     * Translation
79   - title: Student
80     company: University RUdN
81     company_url: ''
82     company_logo: school
83     location: Russia
84     date_start: '2023-09-01'
85     date_end: ''
86     description: Programming and softarchitecture. Implementing several python projects.
87 design:
88   columns: '2'
89 - block: accomplishments
90   content:
91     # Note: `&shy;` is used to add a 'soft' hyphen in a long heading.
92     title: 'Accomplish&shy;ments'
93     subtitle:
94     # Date format: https://docs.hugoblox.com/customization/#date-format
95     date_format: Jan 2006
96     # Accomplishments.
97     # Add/remove as many `item` blocks below as you like.
98     # `title`, `organization`, and `date_start` are the required parameters.
99     # Leave other parameters empty if not required.
100    # Begin multi-line descriptions with YAML's `|2-` multi-line prefix.
101    items:
102      - certificate_url: https://github.com/magister6239/NitsheGame
103        date_end: '2025-10-10'
104        date_start: '2021-01-25'
105        description: ''
106        image: suitcase
```

Элементы сайта на двух языках



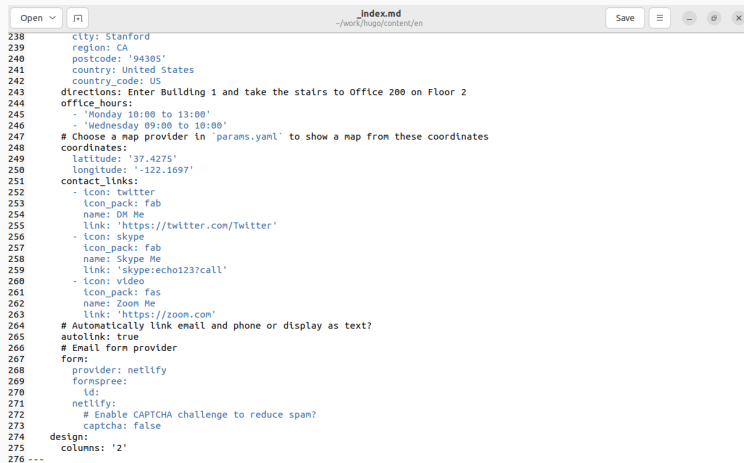
```
103   date_end: '2025-10-10'
104   date_start: '2021-01-25'
105   description: ''
106   icon: python
107   organization: Github
108   organization_url: https://github.com/magister6239
109   title: Python project
110   url: ''
111 - certificate_url: https://github.com/magister6239/study_2023-2024_os-intro
112   date_end: ''
113   date_start: '2021-01-01'
114   description: Whole work
115   icon: sitemap
116   organization: Github
117   organization_url: https://github.com/magister6239
118   title: Computer architecture
119   url: ''
120
121 design:
122   columns: '2'
123 - block: collection
124   id: posts
125   content:
126     title: Recent Posts
127     subtitle: ''
128     text: ''
129     # Choose how many pages you would like to display (0 = all pages)
130     count: 5
131     # Filter on criteria
132     filters:
133       folders:
134         - post
135       author: ""
136       category: ""
137       tag: ""
138       exclude_featured: false
139       exclude_future: false
140       exclude_past: false
141       publication_type: ""
```

Элементы сайта на двух языках



```
208   columns: '2'
209   view: citation
210 - block: collection
211   id: talks
212   content:
213     title: Recent & Upcoming Talks
214     filters:
215       folders:
216         - event
217   design:
218     columns: '2'
219     view: compact
220 - block: tag_cloud
221   content:
222     title: Popular Topics
223   design:
224     columns: '2'
225 - block: contact
226   id: contact
227   content:
228     title: Contact
229     subtitle:
230     text: |-
231       Lorem ipsum dolor sit amet, consectetur adipiscing elit. Nam mi diam, venenatis ut magna et, vehicula efficitur enim.
232     # Contact (add or remove contact options as necessary)
233     email: test@example.org
234     phone: 888 888 88 88
235     appointment_url: 'https://calendly.com'
236     address:
237       street: 450 Serra Mall
238       city: Stanford
239       region: CA
240       postcode: '94305'
241       country: United States
242       country_code: US
243     directions: Enter Building 1 and take the stairs to Office 200 on Floor 2
244     office_hours:
245       - 'Monday 10:00 to 13:00'
246       - 'Tuesday 09:00 to 18:00'
```

Элементы сайта на двух языках



```
238   city: Stanford
239   region: CA
240   postcode: '94305'
241   country: United States
242   country_code: US
243   directions: Enter Building 1 and take the stairs to Office 200 on Floor 2
244   office_hours:
245     - 'Monday 10:00 to 13:00'
246     - 'Wednesday 09:00 to 10:00'
247   # Choose a map provider in 'params.yaml' to show a map from these coordinates
248   coordinates:
249     latitude: '37.4275'
250     longitude: '-122.1697'
251   contact_links:
252     - icon: twitter
253       icon_pack: fab
254       name: DM Me
255       link: 'https://twitter.com/Twitter'
256     - icon: skype
257       icon_pack: fab
258       name: Skype Me
259       link: 'skype:echo123?call'
260     - icon: video
261       icon_pack: fas
262       name: Zoom Me
263       link: 'https://zoom.com'
264   # Automatically link email and phone or display as text?
265   autolink: true
266   # Email form provider
267   form:
268     provider: netlify
269     formspree:
270       id:
271     netlify:
272       # Enable CAPTCHA challenge to reduce spam?
273       captcha: false
274   design:
275     columns: '2'
276 ---
```

Элементы сайта на двух языках

```
Environment: "development"
Serving pages from disk
Running in Fast Render Mode. For full rebuilds on change: hugo server --disableFastRender
Web Server is available at http://localhost:1313/ (bind address 127.0.0.1)
Press Ctrl+C to stop
^Cavperegudov@avperegudov:~/work/hugo$ ~/bin/hugo
Start building sites ...
hugo v0.124.1-db083b05f16c945fec04f745f0ca8640560cf1ec+extended linux/amd64 BuildDate=2024-03-20T11:40:10Z VendorInfo=gohugoio

      | EN | RU |
-----+---+---
Pages | 62 | 61 |
Paginator pages | 1 | 1 |
Non-page files | 43 | 46 |
Static files | 9 | 9 |
Processed images | 91 | 84 |
Aliases | 15 | 14 |
Cleaned | 0 | 0 |

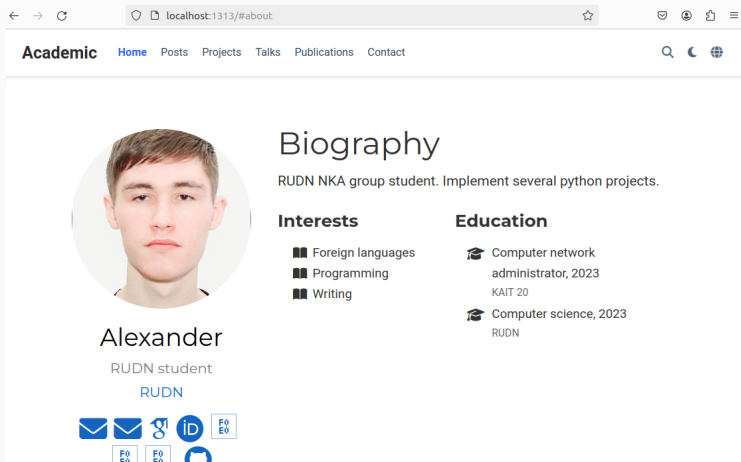
Total in 687 ms
avperegudov@avperegudov:~/work/hugo$
```

Элементы сайта на двух языках

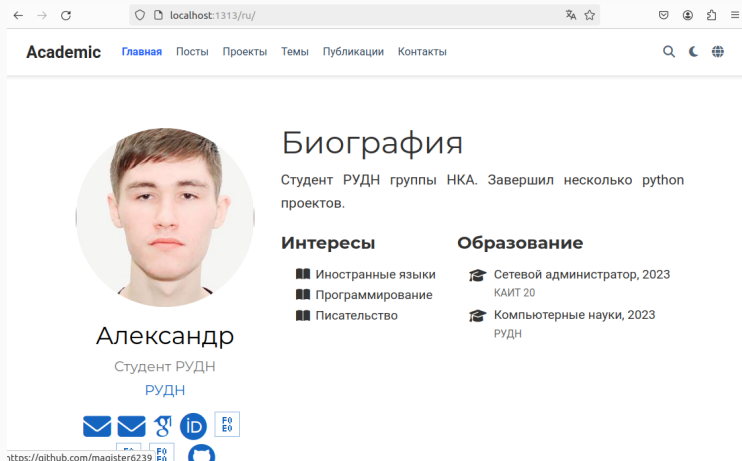
```
avpereregudov@avpereregudov:~/work/hugo$ ~/bin/hugo server
Watching for changes in /home/avpereregudov/{.cache,work}
Watching for config changes in /home/avpereregudov/work/hugo/config/_default, /home/avpereregudov/.cache/hugo_cache/modules/filecache/modules/pkg/mod/github.com/hugo!blox/hugo-blox-builder/modules/blox-plugin-netlify@v1.1.2-0.20231108141515-0478cf6921f9/config.yaml, /home/avpereregudov/.cache/hugo_cache/modules/filecache/modules/pkg/mod/github.com/hugo!blox/hugo-blox-builder/modules/blox-plugin-reveal@v1.1.2/config.yaml, /home/avpereregudov/.cache/hugo_cache/modules/filecache/modules/pkg/mod/github.com/hugo!blox/hugo-blox-builder/modules/blox-bootstrap/v5@v5.9.7/hugo.yaml, /home/avpereregudov/work/hugo/go.mod
Start building sites ...
hugo v0.124.1-db083b05f16c945fec04f745f0ca8640560cf1ec+extended linux/amd64 BuildDate=2024-03-20T11:40:10Z VendorInfo=gohugoio
```

	EN	RU
Pages	62	61
Paginator pages	1	1
Non-page files	43	46
Static files	9	9
Processed images	91	84
Aliases	15	14
Cleaned	0	0

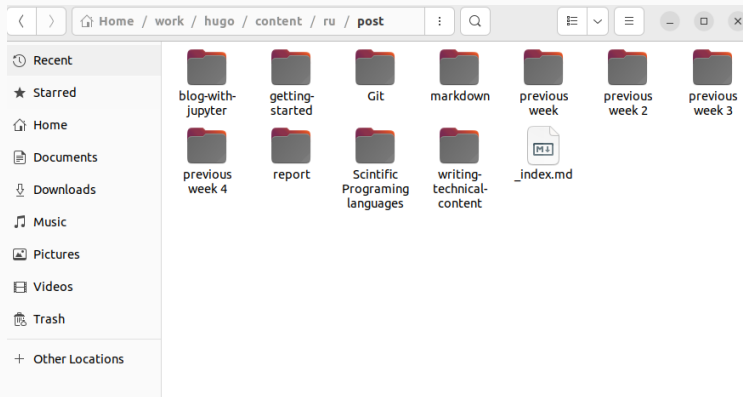
Элементы сайта на двух языках



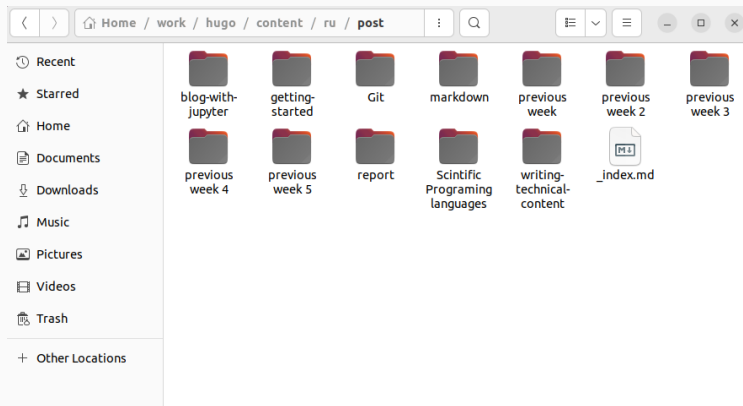
Элементы сайта на двух языках



Элементы сайта на двух языках



Элементы сайта на двух языках

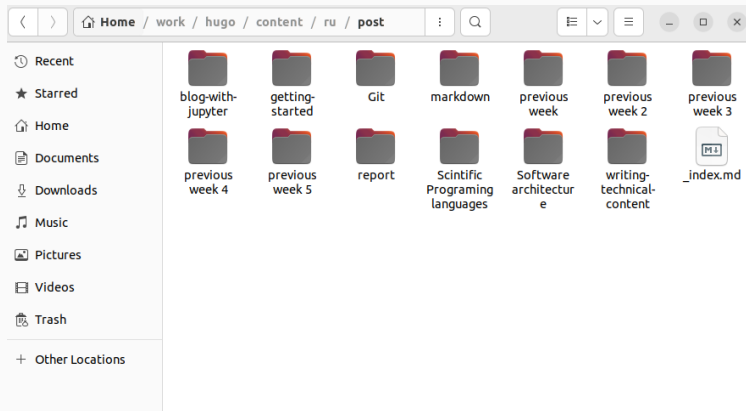


Элементы сайта на двух языках

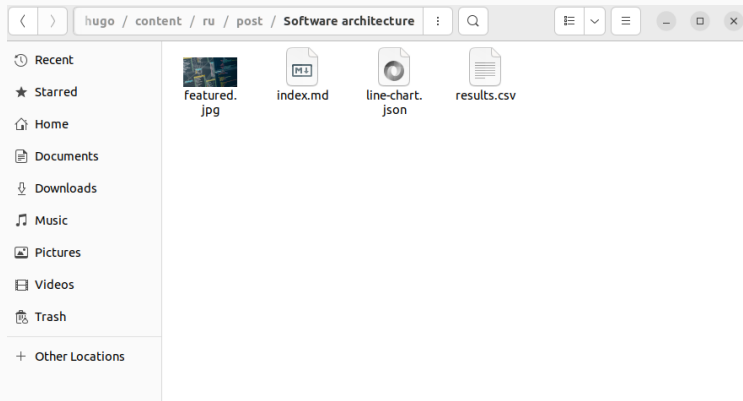
```
Open  ↕  index.md
~/work/hugo/content/ru/post/previous week 5

1 ---
2 title: Блог о событиях за прошедшую неделю (5)
3 date: 2024-05-25
4 math: true
5 image:
6   placement: 2
7   caption: 'Image credit: [John Moeses Bauan](https://unsplash.com/photos/OGZtQF8iC0g)'
8 ---
9
10 ### Контрольные
11
12 Были написаны контрольные по следующим предметам:
13
14 - Дискретная математика
15 - Аналитическая математика
16
17 ### Компьютерная архитектура
18
19 - Была сдана 6 часть самостоятельного проекта
20 - Была сдана 14 лабораторная работа
21
22 ### С наилучшими пожеланиями, Александр 🙌
23 |
```

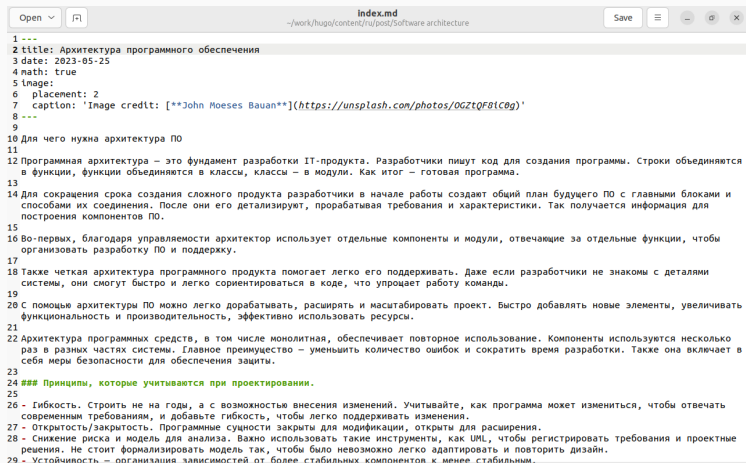
Элементы сайта на двух языках



Элементы сайта на двух языках

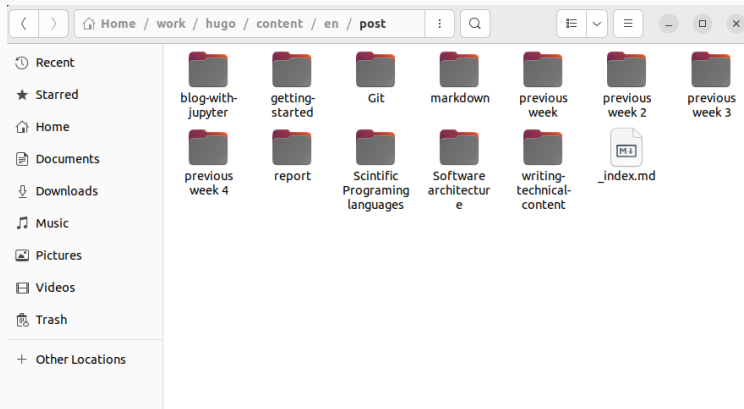


Элементы сайта на двух языках



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2 title: Архитектура программного обеспечения
3 date: 2023-05-25
4 math: true
5 image:
6   placement: 2
7   caption: 'Image credit: [**John Moeses Bauan**](https://unsplash.com/photos/OGZtQF8lC0g)'
8 ---
9
10 Для чего нужна архитектура ПО
11
12 Программная архитектура – это фундамент разработки IT-продукта. Разработчики пишут код для создания программы. Строки объединяются
  в функции, функции объединяются в классы, классы – в модули. Как итог – готовая программа.
13
14 Для сокращения срока создания сложного продукта разработчики в начале работы создают общий план будущего ПО с главными блоками и
  способами их соединения. После они его детализируют, прорабатывая требования и характеристики. Так получается информация для
  построения компонентов ПО.
15
16 Во-первых, благодаря управляемости архитектор использует отдельные компоненты и модули, отвечающие за отдельные функции, чтобы
  организовать разработку ПО и поддержку.
17
18 Также четкая архитектура программного продукта помогает легко его поддерживать. Даже если разработчики не знакомы с деталями
  системы, они смогут быстро и легко сориентироваться в коде, что упрощает работу команды.
19
20 С помощью архитектуры ПО можно легко дорабатывать, расширять и масштабировать проект. Быстро добавлять новые элементы, увеличивать
  функциональность и производительность, эффективно использовать ресурсы.
21
22 Архитектура программных средств, в том числе монолитная, обеспечивает повторное использование. Компоненты используются несколько
  раз в разных частях системы. Главное преимущество – уменьшить количество ошибок и сократить время разработки. Также она включает в
  себя меры безопасности для обеспечения защиты.
23
24 ### Принципы, которые учитываются при проектировании.
25
26 - Гибкость. Строить не на годы, а с возможностью внесения изменений. Учитывайте, как программа может измениться, чтобы отвечать
  современным требованиям, и добавьте гибкость, чтобы легко поддерживать изменения.
27 - Открытость/закрытость. Программные сущности закрыты для модификации, открыты для расширения.
28 - Снижение риска и модель для анализа. Важно использовать такие инструменты, как UML, чтобы регистрировать требования и проектные
  решения. Не стоит формализовать модель так, чтобы было невозможно легко адаптировать и повторить дизайн.
29 - Устойчивость – организация зависимостей от более стабильных компонентов к менее стабильным.
```

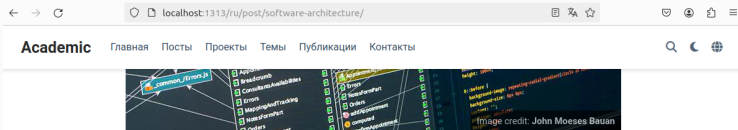
Элементы сайта на двух языках



Элементы сайта на двух языках

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2 title: Software architecture
3 date: 2023-25-05
4 math: true
5 image:
6   placement: 2
7   caption: 'Image credit: [**John Moeses Bauan**](https://unsplash.com/photos/OGZtQF8tC0g)'
8 ---
9
10 ### What is software architecture for?
11
12 Software architecture is the foundation of IT product development. Developers write code to create a program. Strings are combined
  into functions, functions are combined into classes, classes are combined into modules. The result is a finished program.
13
14 To reduce the time required to create a complex product, developers at the beginning of work create a general plan for the future
  software with the main blocks and ways to connect them. Then they detail it, working out the requirements and characteristics. This
  is how information is obtained to build software components.
15
16 First, due to manageability, the architect uses individual components and modules responsible for individual functions to organize
  software development and support.
17
18 Also, the clear architecture of the software product makes it easy to support. Even if developers are not familiar with the details
  of the system, they will be able to quickly and easily navigate the code, making the team's work easier.
19
20 With the help of software architecture, you can easily modify, expand and scale the project. Quickly add new elements, increase
  functionality and productivity, and use resources efficiently.
21
22 Software architecture, including monolithic architecture, allows for reuse. Components are used multiple times in different parts
  of the system. The main benefit is to reduce the number of errors and reduce development time. It also includes safety measures to
  ensure protection.
23
24 Basic principles of software architecture
25
26 ### Principles that are taken into account during design.
27
28 - Flexibility. Build not for years, but with the possibility of making changes. Consider how the program may change to meet modern
  needs, and add flexibility to easily support changes.
29 - Openness/closedness. Software entities are closed for modification and open for expansion.
30 - Risk reduction and analysis model. It is important to use tools such as UML to capture requirements and design decisions. You
```

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Для чего нужна архитектура ПО

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