



What is Function?

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Last lecture

- Short Presentation
- Review the Last Lecture
- Coding a simple example
- Programming with Python
- **Application of Programming in the Digital Age!**



Today

- Short Presentation
- Review the Last Lecture
- Different scopes in Python
- Programming with Python
- **Application of Programming in the Digital Age!**



Together

Send your feedback about the
class whenever you want!



Contact me

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- Telegram: [@IKJ1992](https://t.me/IKJ1992)





Grading

راه جبران هم تحت شرایطی
وجود داره!

- Approx. 25% Programming Assignments (judgment with Quera)
- Approx. 14% Mid-term Project (alone, judgment with TAs and Quera)
- Approx. 37% Final Project (team work~5 member, judgment with TAs and Quera)
 - *Proposal (about real needs)*
 - *Coding*
 - *Release*
- Approx. 30% Final Exam (algorithm-based paper exam)
- Approx. 5% Short Presentation(extra score , for the next week lecture, only for the first two person)
- Approx. 2% Challenging Questions and Contributions in Class or Telegram group (extra score)
- Approx. 7% long presentation (extra score)
- Approx. ?% Quiz

Short Presentations

Review the Last Lecture



From question to algorithm!

- Understand your needs or questions!
 - explain easily for someone else
- Decompose your problem (make some steps)!
- Make a flowchart for the decomposed version of your problem
- Explain each steps in one or two sentences (paper-based or paperless)
 - input, output, process
- Explain each steps mathematically...
- Develop your algorithms for each steps
- Check your process flow from the first step to the last one!



Question

What is the website need?

- How can we get more users for our news website?

آیا کارمون اخلاقی بود؟؟؟

- Our solution: find most frequent words in news



Ask your Questions, even **SIMPLE** ones!

- Ask question
- Think about answer
- Ask question
- Read more about it through internet
- Ask question
- Read another pages or listen to others' explanation
- Ask question
- ...

Ask your Question 😊

این درس برای پیشرفت شماست...



مسئله ترافیک و پمپ بزنین رو فکر کردی بهش؟

Different Scops in Python

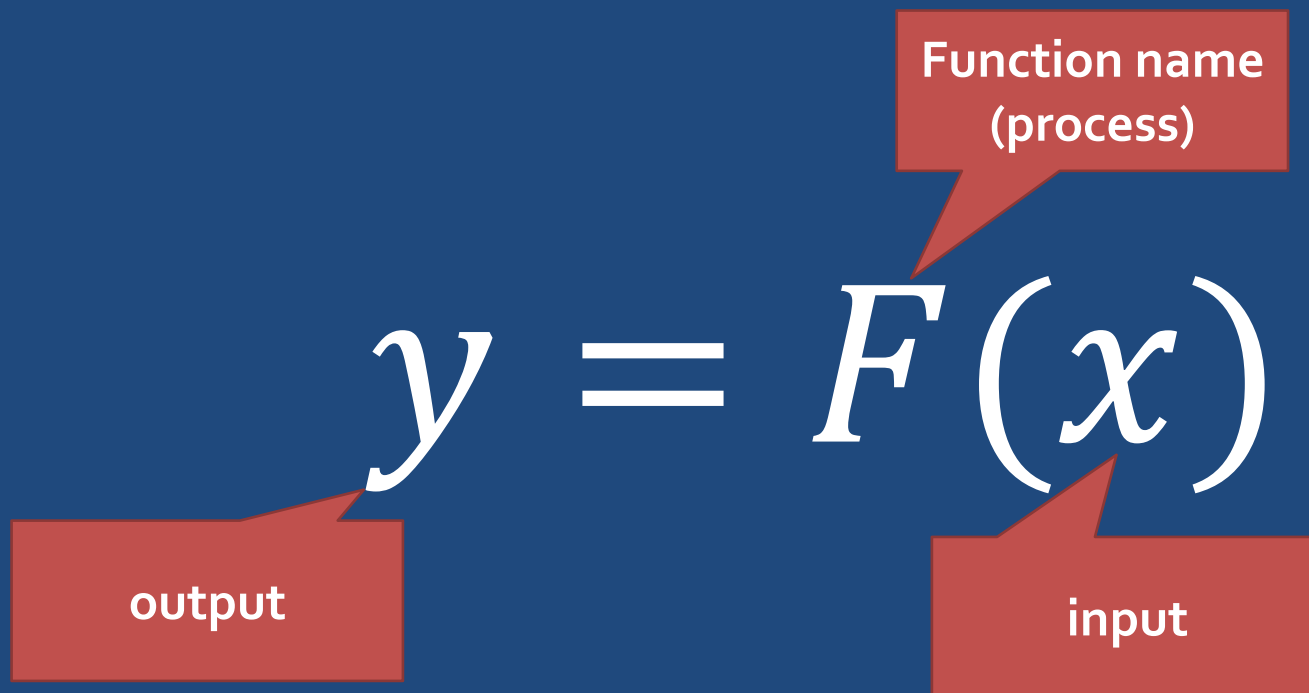


I want to run our `power.py` for different inputs

What is your solution?

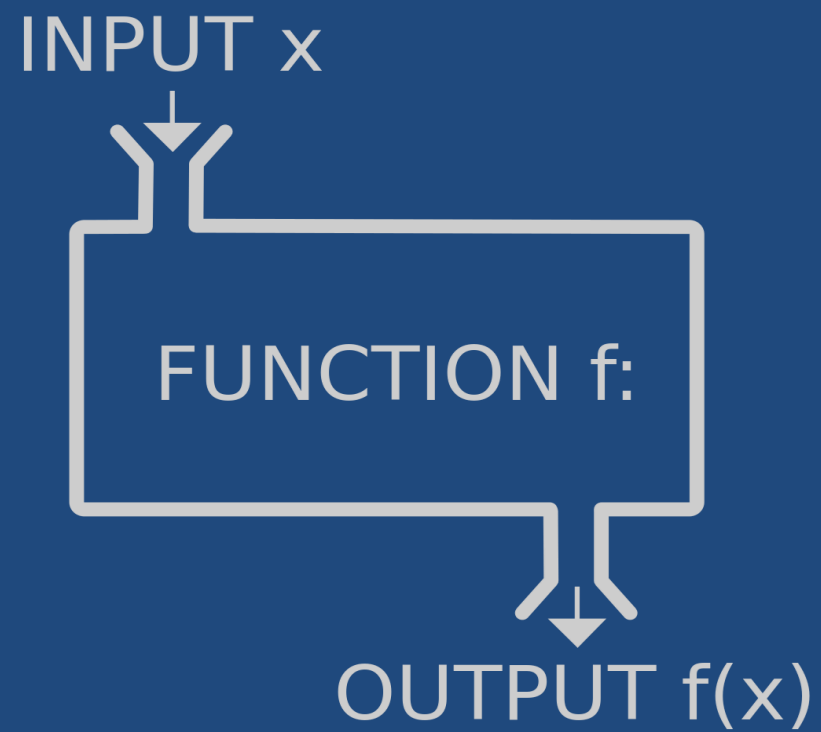


Functions





Functions



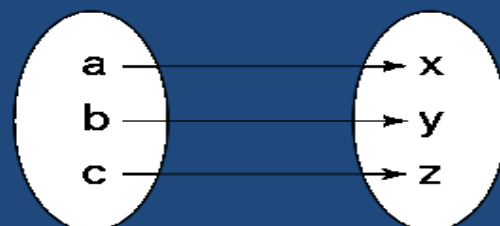


Functions

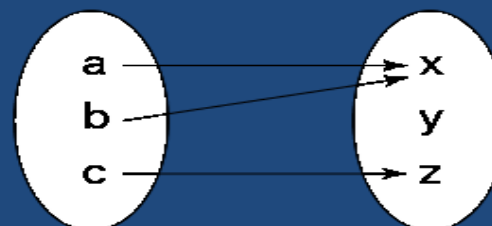


Function

1 to 1

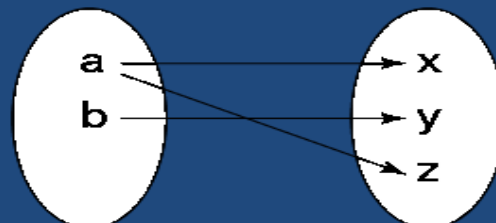


Many to 1

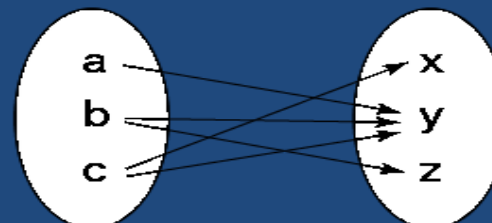


Non-Function

1 to many

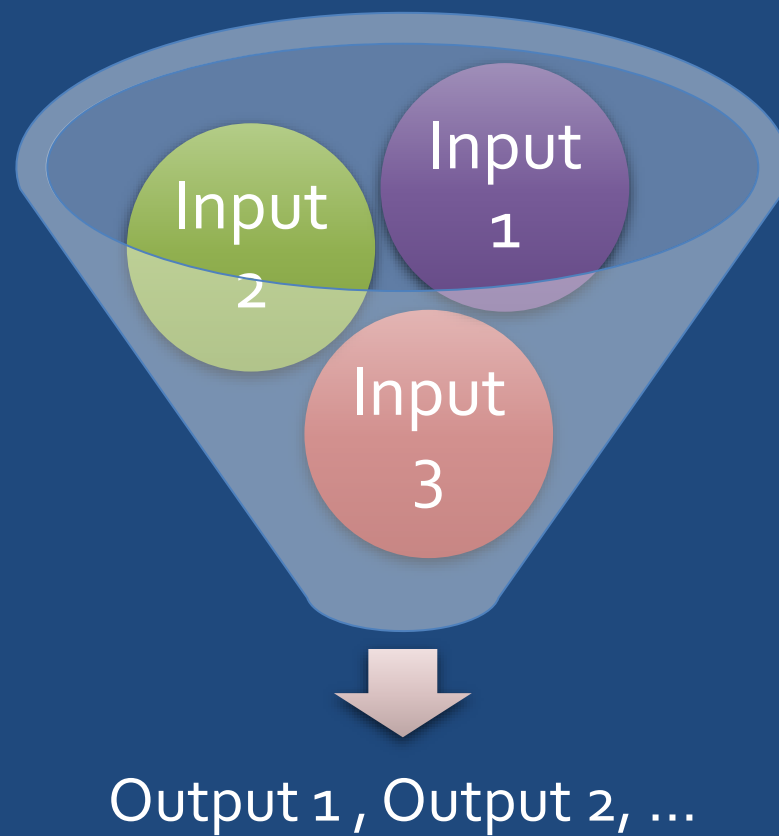


Many to many





Functions





Modules



Packages

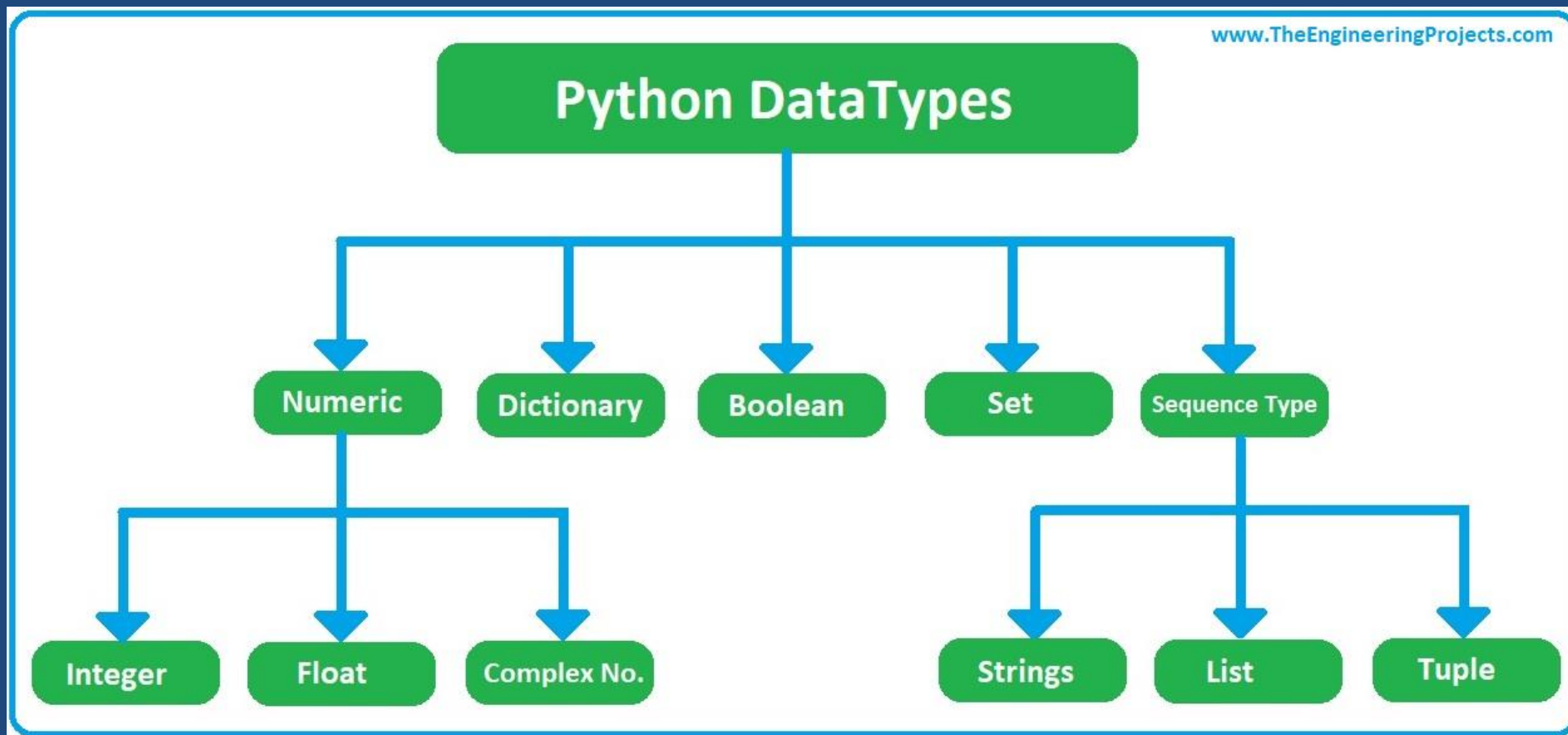


SuperPackages

Programming with Python






Python DataTypes












List methods | what is methods?!?!



PYTHON LIST METHODS *Cheatsheet FOR BABIES*



 @brijpandeyji
Brij Kishore Pandey  




 **.append()** → 




 **.count()** → 2



 **.copy()** → 



 **.index()** → 2

 **.reverse()** → 

 **.remove()** → 

 **.insert(1, )** → 

 **.pop(1)** → 

 **.pop()** → 

Brij Kishore Pandey



Question

What is the website need?

- How can we get more users for our news website?

علاقه کاربرها مهم هستند!

- Our solution: find most frequent words in news



Example of news

- <https://www.theguardian.com/uk-news/2023/mar/05/rishi-sunaks-plan-for-small-boats-will-lock-up-people-fleeing-war>



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Let's go for your solutions and coding with each other 😊

- Input?
- Output?
- Process?



Application of Programming in the Digital Age!



code.NASA.gov





Project 1

Mission Simulation Toolkit (MST)

<https://ti.arc.nasa.gov/opensource/projects/mission-simulation-toolkit/>

NASA Open Source 3.0

MST offers a simulation framework to support research in autonomy for remote exploration. The system allows developers to test models in a high-fidelity simulation and then evaluate system performance against a set of integrated, standardized simulations.

A.I. generated tags: **#nlp:autonomy #nlp:mathematical model #nlp:distributed processing #nlp:computerized simulation #nlp:systems simulation #nlp:dynamic model #nlp:digital simulation #nlp:simulation #nlp:performance prediction #nlp:model**

Human generated tags: **#NASA #ARC #Open Source #Autonomous Systems**



Project 2

Sound Lab (SLAB), Version 5

<https://ti.arc.nasa.gov/opensource/projects/slab-spatial-audio-renderer/>

NASA Open Source 3.0

SLAB is a software-based, real-time, virtual acoustic-environment rendering system designed to study spatial hearing in environments such as concert halls, listening rooms, virtual reality, aviation spatial information displays, and video game sound effects.

A.I. generated tags: **#nlp:real time operation #nlp:game theory #nlp:interactive control #nlp:time dependence #nlp:computer graphic #nlp:virtual reality #nlp:display device #nlp:hearing**

Human generated tags: **#NASA #ARC #Open Source #System Testing**



Lecture Resources