



UNIVERSITAS SAM RATULANGI MANADO
FAKULTAS TEKNIK, JURUSAN TEKNIK ELEKTRO
Program Studi S-1 Teknik Informatika

Himpunan

Mata Kuliah: Algoritma & Logika Informatika (IFC3504)

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Tinjauan Matematis Himpunan (Set)

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- **Himpunan** adalah kumpulan objek yang dianggap satu kesatuan.
- Ketika kita menyatakan: “ x adalah anggota himpunan S ”:
 - Ekspresi: $x \in S$ berarti elemen x adalah anggota dari himpunan S
 - Jika $x_1, x_2, x_3, \dots, x_n$ adalah semua anggota dari himpunan S maka kita dapat menulis: $S = \{x_1, x_2, x_3, \dots, x_n\}$ dimana tiap anggota S harus unik dan urutan tidak penting.
 - Himpunan kosong \emptyset adalah himpunan tanpa anggota

Himpunan dalam Python

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- Himpunan (set) adalah kumpulan elemen-elemen yang tak-berurut dan tak-terduplikasi.
- Kenapa menggunakan Himpunan?
 - ▣ Menguji keanggotaan (membership) → index/urutan tak penting
 - ▣ Menguji duplikasi

Himpunan dalam Python

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- Menggunakan kurung kurawal: { ... }
- Anggota dipisahkan koma
- Bisa juga menggunakan fungsi: **set()**.
 - ▣ Sebagai argumen fungsi set, kita gunakan nilai bertipe data sequence (List, Tuple, atau String)
 - ▣ Untuk membuat himpunan kosong, kita harus menggunakan fungsi **set()**.

Membuat Himpunan

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```
Alwin-no-MacBook-Pro:~ asambul$ python3
Python 3.4.3 (v3.4.3:9b73f1c3e601, Feb 23 2015, 02:52:03)
[GCC 4.2.1 (Apple Inc. build 5666) (dot 3)] on darwin
Type "help", "copyright", "credits" or "license" for more information.
>>> a = {4,2,3,1,5}
>>> a
{1, 2, 3, 4, 5}
>>> b = set([3,2,1,4,5])
>>> b
{1, 2, 3, 4, 5}
>>> 4 in a
True
>>> 6 in a
False
>>> 3 in b
True
>>> 6 in b
False
>>> □
```

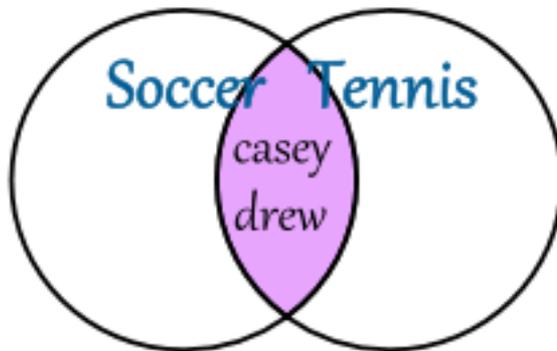
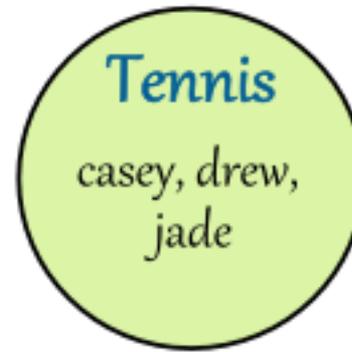
Operasi2 Anggota Himpunan

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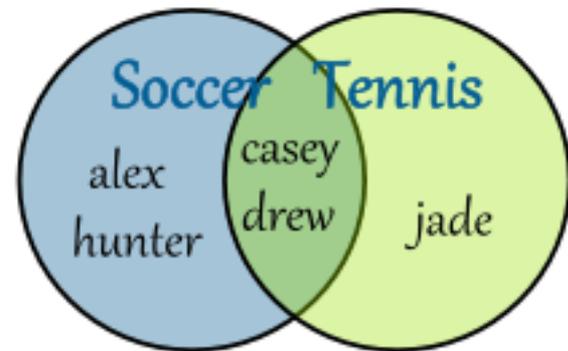
```
asambul — Python — 80x24
Alwin-no-MacBook-Pro:~ asambul$ python3
Python 3.4.3 (v3.4.3:9b73f1c3e601, Feb 23 2015, 02:52:03)
[GCC 4.2.1 (Apple Inc. build 5666) (dot 3)] on darwin
Type "help", "copyright", "credits" or "license" for more information.
>>> a = {4,2,3,1,5}
>>> a
{1, 2, 3, 4, 5}
>>> a.add(6)
>>> a.update([6,7])
>>> a
{1, 2, 3, 4, 5, 6, 7}
>>> a.remove(7)
>>> a
{1, 2, 3, 4, 5, 6}
>>> for i in a:
...     print(i)
...
1
2
3
4
5
6
>>> 
```

Irisan dan Gabungan

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Venn Diagram: Intersection of 2 Sets



Venn Diagram: Union of 2 Sets

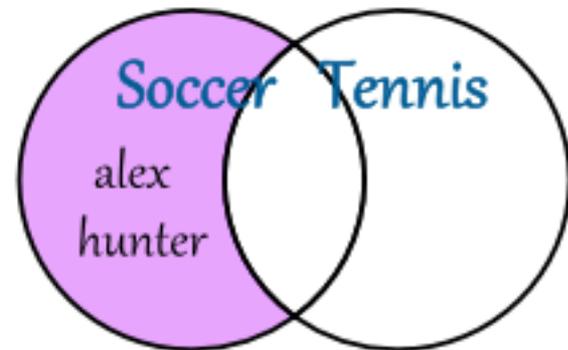
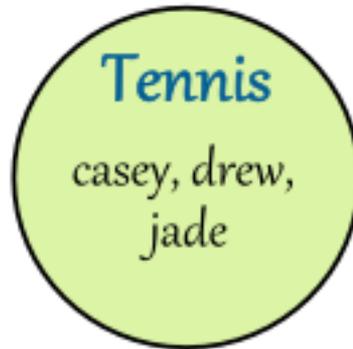
Irisan dan Gabungan dalam Python

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```
Alwin-no-MacBook-Pro:~ asambul$ python3
Python 3.4.3 (v3.4.3:9b73f1c3e601, Feb 23 2015, 02:52:03)
[GCC 4.2.1 (Apple Inc. build 5666) (dot 3)] on darwin
Type "help", "copyright", "credits" or "license" for more information.
>>> a = {1,2,3,4,5}
>>> b = {4,5,6,7,8}
>>> # irisan
...
>>> a & b
{4, 5}
>>> #gabungan
...
>>> a | b
{1, 2, 3, 4, 5, 6, 7, 8}
>>> □
```

Selisih 2 himpunan

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Venn Diagram: Difference of 2 Sets

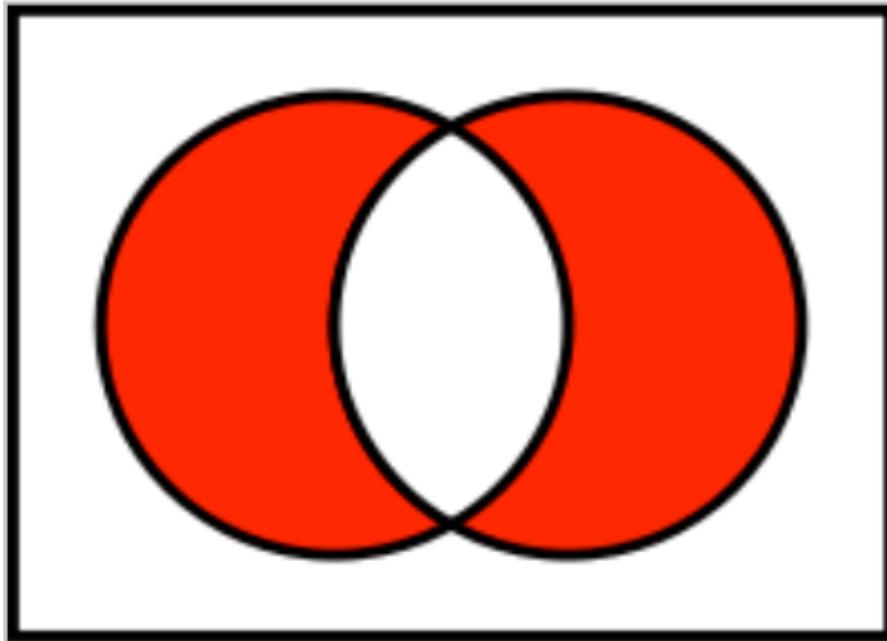
Selisih 2 himpunan dalam Python

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```
Alwin-no-MacBook-Pro:~ asambul$ python3
Python 3.4.3 (v3.4.3:9b73f1c3e601, Feb 23 2015, 02:52:03)
[GCC 4.2.1 (Apple Inc. build 5666) (dot 3)] on darwin
Type "help", "copyright", "credits" or "license" for more information.
>>> a = {1,2,3,4,5}
>>> b = {4,5,6,7,8}
>>> # irisan
...
>>> a & b
{4, 5}
>>> #gabungan
...
>>> a | b
{1, 2, 3, 4, 5, 6, 7, 8}
>>> a - b
{1, 2, 3}
>>> b - a
{8, 6, 7}
>>> █
```

Symmetric Difference

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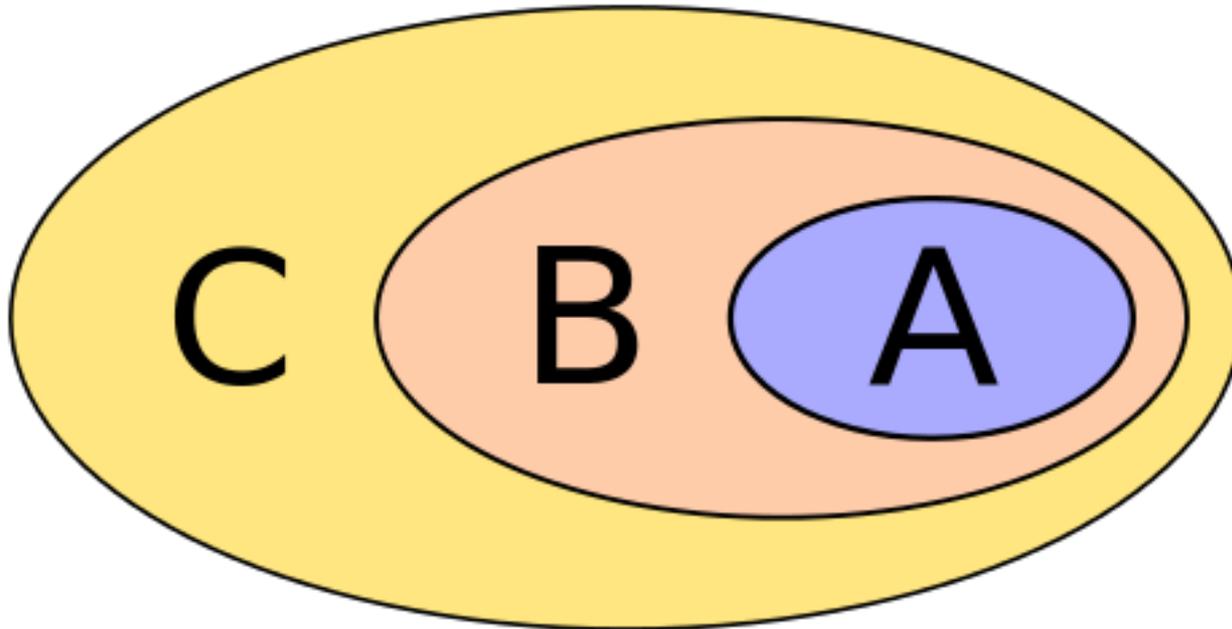
Symmetric Diff. dalam Python

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```
asambul -- Python -- 80x24
Alwin-no-MacBook-Pro:~ asambul$ python3
Python 3.4.3 (v3.4.3:9b73f1c3e601, Feb 23 2015, 02:52:03)
[GCC 4.2.1 (Apple Inc. build 5666) (dot 3)] on darwin
Type "help", "copyright", "credits" or "license" for more information.
>>> a = {1,2,3,4,5}
>>> b = {4,5,6,7,8}
>>> # irisan
...
>>> a & b
{4, 5}
>>> #gabungan
...
>>> a | b
{1, 2, 3, 4, 5, 6, 7, 8}
>>> a - b
{1, 2, 3}
>>> b - a
{8, 6, 7}
>>> a ^ b
{1, 2, 3, 6, 7, 8}
>>> □
```

Subset dan Superset

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Subset dan Superset dalam Python

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```
asambul -- Python -- 70x24
Alwin-no-MacBook-Pro:~ asambul$ python3
Python 3.4.3 (v3.4.3:9b73f1c3e601, Feb 23 2015, 02:52:03)
[GCC 4.2.1 (Apple Inc. build 5666) (dot 3)] on darwin
Type "help", "copyright", "credits" or "license" for more information.
>>> a = {1,2,3,4,5}
>>> b = {1,2}
>>> b <= a
True
>>> a <= b
False
>>> □
```

Frozenset

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```
Alwin-no-MacBook-Pro:~ asambul$ python3
Python 3.4.3 (v3.4.3:9b73f1c3e601, Feb 23 2015, 02:52:03)
[GCC 4.2.1 (Apple Inc. build 5666) (dot 3)] on darwin
Type "help", "copyright", "credits" or "license" for more information.
>>> a = {1,2,3,4,5}
>>> b = {1,2}
>>> b <= a
True
>>> a <= b
False
>>> c = frozenset([1,2,3])
>>> a & c
{1, 2, 3}
>>> a.add(4)
>>> b.add(4)
>>> c.add(4)
Traceback (most recent call last):
  File "<stdin>", line 1, in <module>
AttributeError: 'frozenset' object has no attribute 'add'
>>> █
```