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

Kendali Seleksi

Mata Kuliah: Algoritma & Logika Informatika (IFC3504)

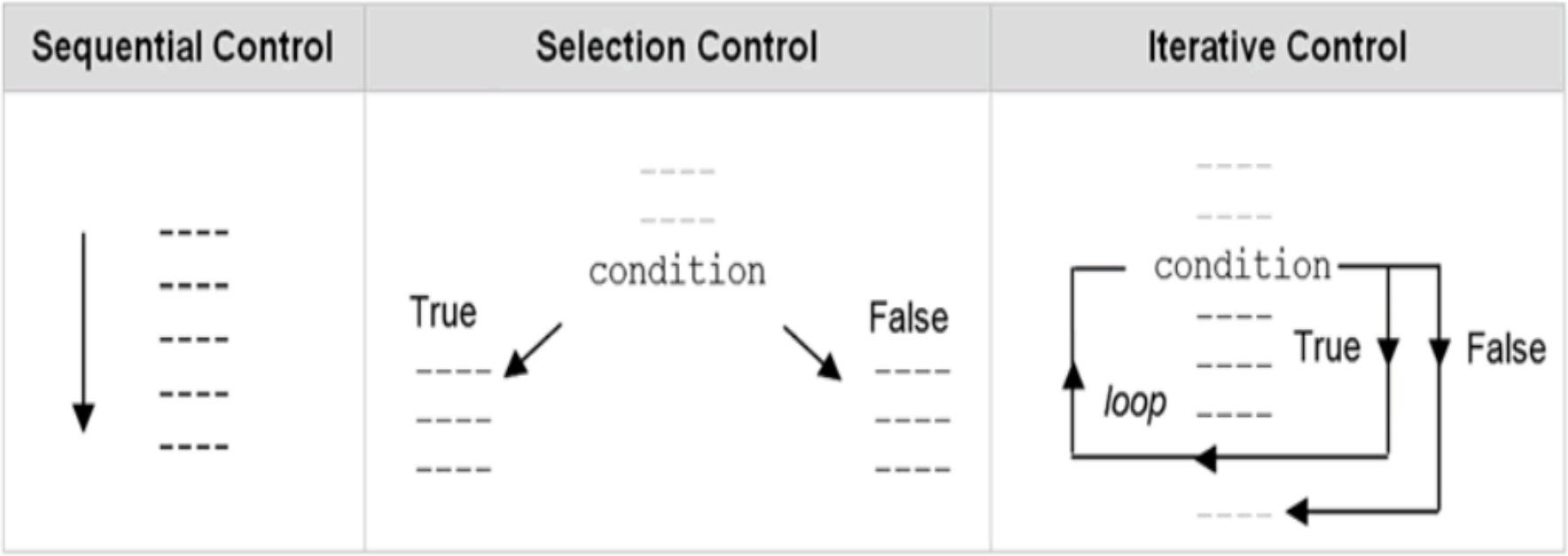
Alwin M. Sambul, S.T., M.Eng., Ph.D.

8. Struktur2 Kendali

Aliran Kendali

- Aliran kendali = urutan eksekusi instruksi2 dalam program
- Statement kendali = statement yang menentukan aliran kendali dari sekelompok instruksi
- Ada 2 bentuk dasar kendali:
  1. Kendali sekuensial
  2. Kendali seleksi
  3. Kendali iteratif

Bentuk2 dasar kendali



9. Ekspresi Boolean

Conditions

- **Kendali seleksi** dan **kendali iteratif** mengandung *conditions*.
- **Condition** = Kondisi yang mempengaruhi arah aliran program
  - Dinyatakan dengan **ekpresi Boolean**
  - Ekpresi Boolean menghasilkan nilai bertipe data **Boolean**: True and False

Ekspresi Relational

- **Ekspresi relational:**
  - Termasuk Ekspresi Boolean, karena menghasilkan nilai Boolean (True/False).
- Menggunakan **Operator Relational:**
  - == dan !=
  - < dan >
  - <= dan >=

Relational Operators	Example	Result
== equal	10 == 10	True
!= not equal	10 != 10	False
< less than	10 < 20	True
> greater than	'Alan' > 'Brenda'	False
<= less than or equal to	10 <= 10	True
>= greater than or equal to	'A' >= 'D'	False

LET'S TRY IT

From the Python Shell, enter the following and observe the results.

```
>>> 10 == 20
???
>>> 10 != 20
???
>>> 10 <= 20
???
```

```
>>> '2' < '9'
???
>>> '12' < '9'
???
>>> '12' > '9'
???
```

```
>>> 'Hello' == "Hello"
???
>>> 'Hello' < 'Zebra'
???
>>> 'hello' < 'ZEBRA'
???
```

Operator Keanggotaan

- Operator keanggotaan: **in**
  - Menentukan apakah sebuah nilai berada dalam daftar atau tidak
  - Daftar nilai ditulis dalam **Tuple**: (…)
  - Hasil: **True** jika ditemukan, **False** jika tidak
- Operator: **not in** → kebalikan

Membership Operators	Examples	Result
in	10 in (10, 20, 30)	True
	red in ('red','green','blue')	True
not in	10 not in (10, 20, 30)	False

LET'S TRY IT

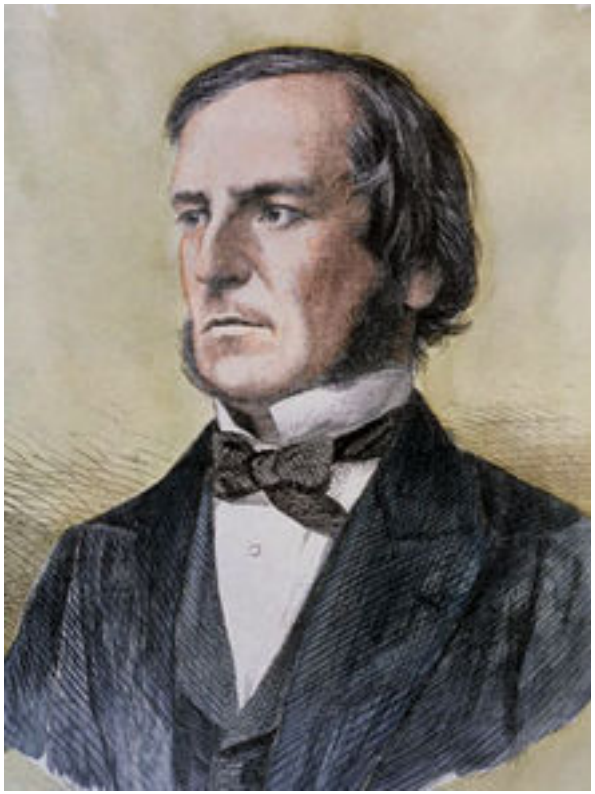
From the Python Shell, enter the following and observe the results.

```
>>> 10 in (40, 20, 10)
???

>>> 10 not in (40, 20, 10)
???

>>> .25 in (.45, .25, .65)
???
```

```
>>> grade = 'A'
>>> grade in ('A','B','C','D','F')
???

>>> city = 'Houston'
>>> city in ('NY', 'Baltimore', 'LA')
???
```

Operator Boolean

- **Aljabar Boolean:** Diperkenalkan oleh George Boole (mid 1800)
- Ada 3 operator Boolean:
  - and
  - or
  - not



Tabel Kebenaran

x	y		x and y	x or y	not x
False	False		False	False	True
True	False		False	True	False
False	True		False	True	
True	True		True	True	

LET'S TRY IT

From the Python Shell, enter the following and observe the results.

```
>>> True and False
???
>>> True or False
???
>>> not(True) and False
???
>>> not(True and False)
???
```

```
>>> (10 < 0) and (10 > 2)
???
>>> (10 < 0) or (10 > 2)
???
>>> not(10 < 0) or (10 > 2)
???
>>> not(10 < 0 or 10 > 2)
???
```

10. Kendali Seleksi

Kendali Seleksi

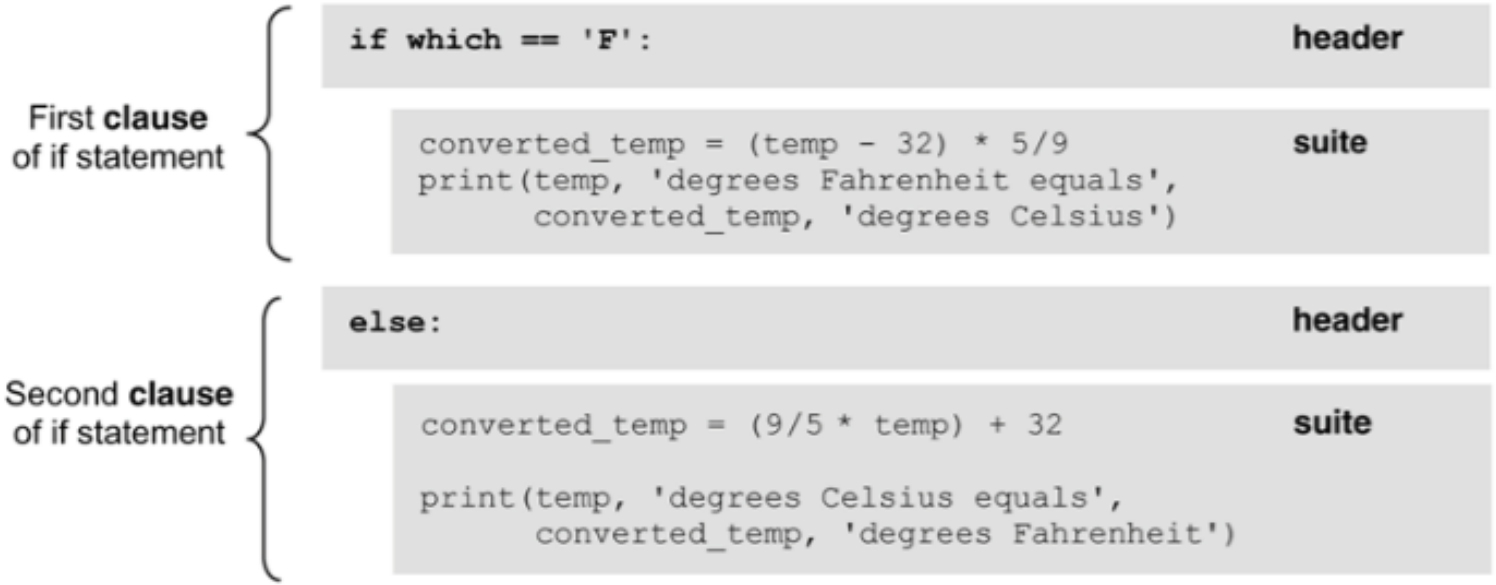
- **Statemen Kendali Seleksi** = statemen kendali yang menyeleksi eksekusi instruksi
- Statemen Kendali Seleksi: **if, else**
- Termasuk **statemen campuran** (compound): statemen yang berisi statemen lain.

if statement	Example use	

`if condition:`
`  statements`
`else:`
`  statements`
	`if grade >= 70:`
	`  print('passing grade')`
	`else:`
	`  print('failing grade')`
		`if grade == 100:`
		`  print('perfect score!')`

Indentasi Dalam Python

- Kekhasan Python = indentasi adalah signifikan
- Dalam bahasa lain, indentasi hanya untuk meningkatkan readibility dan tidak memiliki efek pada logika program.



Contoh indentasi yang salah

Valid indentation		Invalid indentation	

(a)
``if condition:
    statement
    statement
else:
    statement
    statement```
	(b)
	``if condition:
	    statement
	    statement
	else:
	        statement
	        statement```
		(c)
		``if condition:
		   statement
		  statement
		else:
		   statement
		   statement```
			(d)
			``if condition:
			   statement
			   statement
			else:
			   statement
			    statement```

LET'S TRY IT

From IDLE, create and run a Python program containing the code on the left and observe the results. Modify and run the code to match the version on the right and again observe the results. Make sure to indent the code exactly as shown.

```
grade = 90
if grade >= 70:
   print('passing grade')
else:
   print('failing grade')
```

```
grade = 90
if grade >= 70:
   print('passing grade')
 else:
   print('failing grade')
```

Seleksi Multi-cara

- Statemen IF-Bersusun (nested-IF):

Nested if statements	Example use

```
if condition:
    statements
else:
    if condition:
        statements
    else:
        if condition:
            statements

            etc.
```

```
if grade >= 90:
    print('Grade of A')
else:
    if grade >= 80:
        print('Grade of B')
    else:
        if grade >= 70:
            print('Grade of C')
        else:
            if grade >= 60:
                print('Grade of D')
            else:
                print('Grade of F')
```

Seleksi Multi-cara (cont.)

- Header **elif**
  - Untuk seleksi dengan lebih banyak opsi, cara ini dianjurkan ketimbang nested-IF.

```
if grade >= 90:
    print('Grade of A')
elif grade >= 80:
    print('Grade of B')
elif grade >= 70:
    print('Grade of C')
elif grade >= 60:
    print('Grade of D')
else:
    print('Grade of F')
```

Rangkuman

Aliran Kendali, Statemen Kendali, Kendali Sekuensial, kendali Seleksi, Kendali Iteratif, Kondisi, Ekspresi Boolean, Nilai Boolean, Operator Relasional, Operator Keanggotaan, Operator Boolean, Statemen Kendali Seleksi, Indentasi, if-else, if-Bersusun, Header elif.