Control (1A)

Young Won Lim
8/17/15
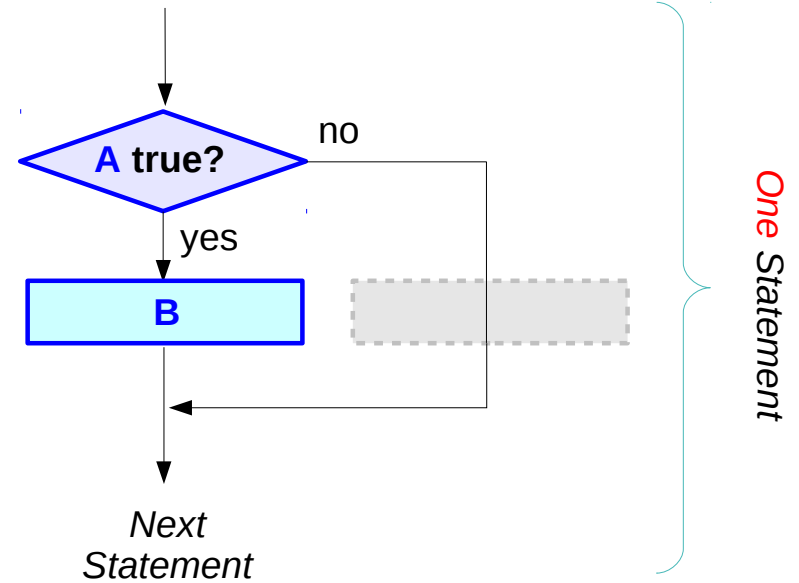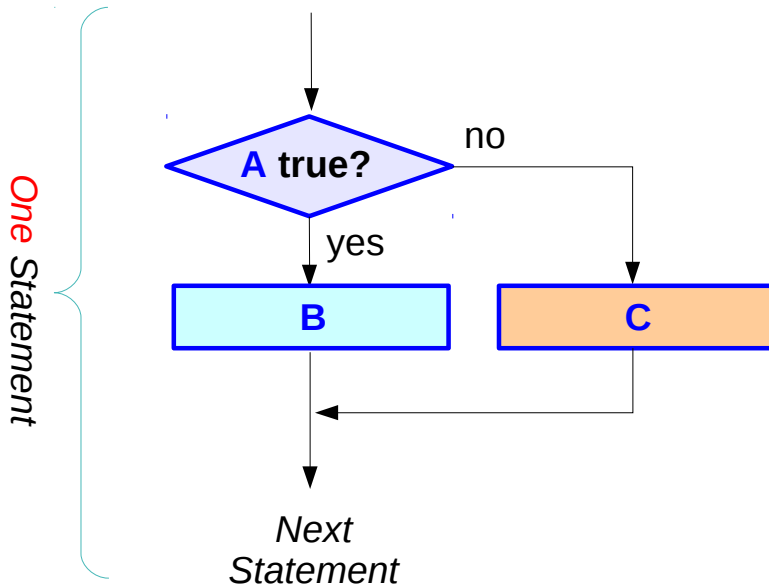
Please send corrections (or suggestions) to youngwlim@hotmail.com.

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8/17/15

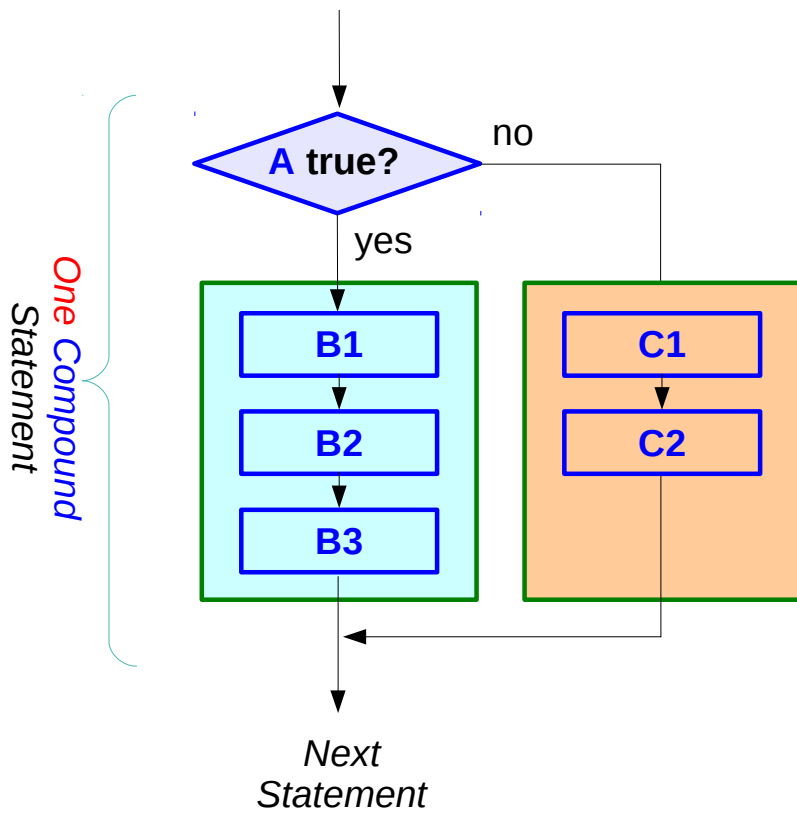# **If** Statement

if (A) B;
else   C;
endif

if (A) B;
endif

One Statement

no

A true?

yes

B   C

Next Statement

One Statement

no

A true?

yes

B

Next Statement

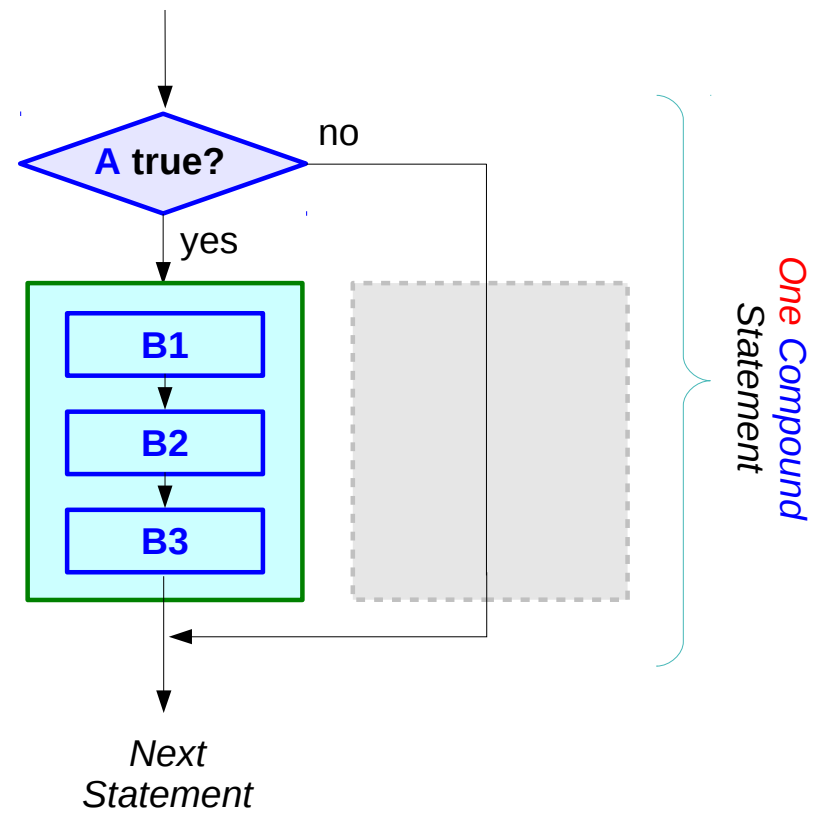# **If** Compound Statement

```
if ( A )   B1; B2; B3;
else       C1; C2;
endif
```

```
if ( A )   B1; B2; B3;
endif
```


One Compound Statement

A true?

no

yes

B1

B2

B3

C1

C2

Next Statement

One Compound Statement

A true?

no

yes

B1

B2

B3

Next Statement

Cases of **if-else** Statements (1)

*Each of these if statements are treated as a **single statement**.*

if (**A**)
endif

if (**A**)
else
endif
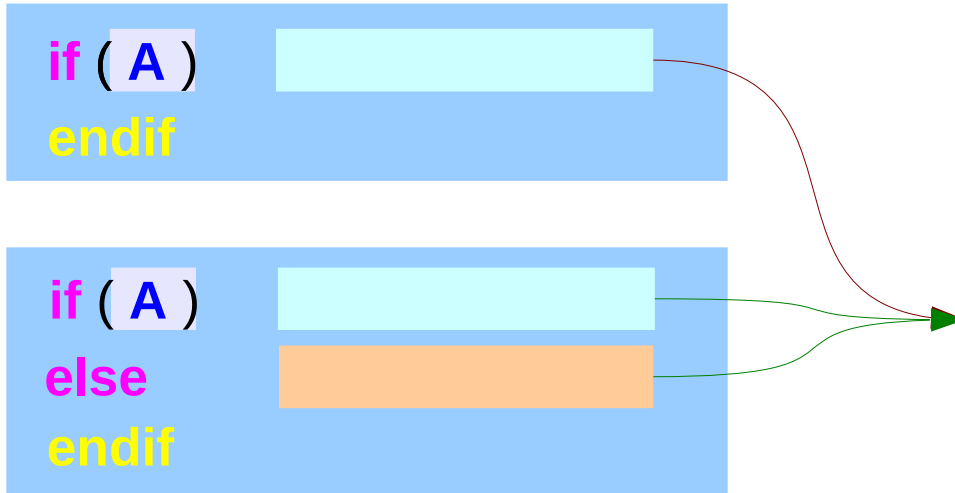
If clause and else clause can be

1) a single statement

St1;

2) a compound statement

St1; **St2**; **St3**;

3) a nested if statement

if (**B**)
endif

4) a nested if-else statement

if (**B**)
else
endif

Cases of **if-else** Statements (2)

if clause

single if clause

if (A)   **B1; endif**

compound if clause

if (A)   **B1**; **B2**; **endif**

if-else clause

single if – single else clause

if (A)   **B1;**

else   **C1**;   **endif**

single if – compound else clause

if (A)   **B1;**

else   **C1**; **C2**;   **endif**

compound if – single else clause

if (A)   **B1**; **B2;**

else   **C1**;   **endif**

compound if – compound else clause

if (A)   **B1**; **B2**;

else   **C1**; **C2**;   **endif**

Pairing **if** and **else**

*An **else** clause is matched with the **closest** **if** clause*

if (**A**)
✗
    if (**B**)   S1;
    else   S2;   **endif**
   else   S3;   **endif**

➡

if (**A**)
    if (**B**)   S1;
    else   S2;   **endif**
  else   S3;   **endif**

---

if (**A**)   S1;
else
if (**B**)   S2;
else   S3;
endif
endif

➡

if (**A**)   S1;
else
   if (**B**)   S2;
   else   S3;
   endif
endif

Control

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Nested **If** Statement (1)

if (**A1**)

  if (**A2**)   B2;

  else   C2; **endif**

else   C1 **endif**

➡

if (**A1**)

   if (**A2**)   B2;

   else   C2; **endif**

else   C1; **endif**

if

A1 true? — no

yes

A2 true? — no

yes

B2   C2   C1

A1

A1·A2

B2   C2
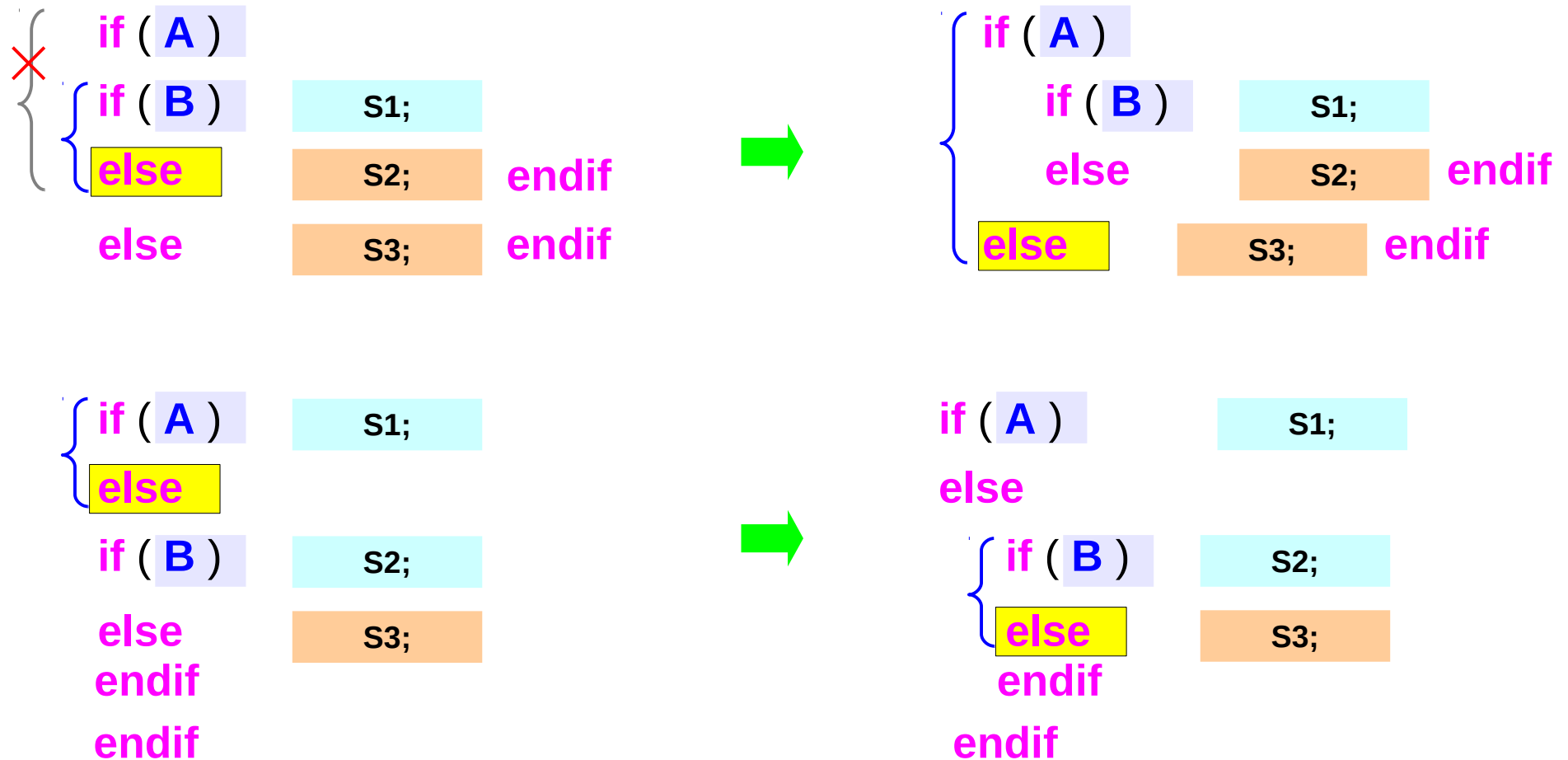
C1
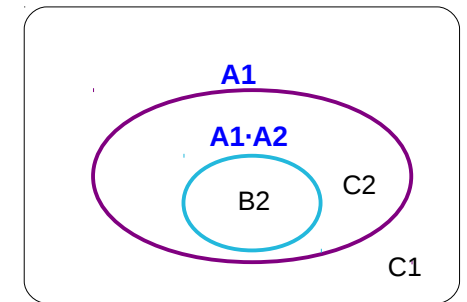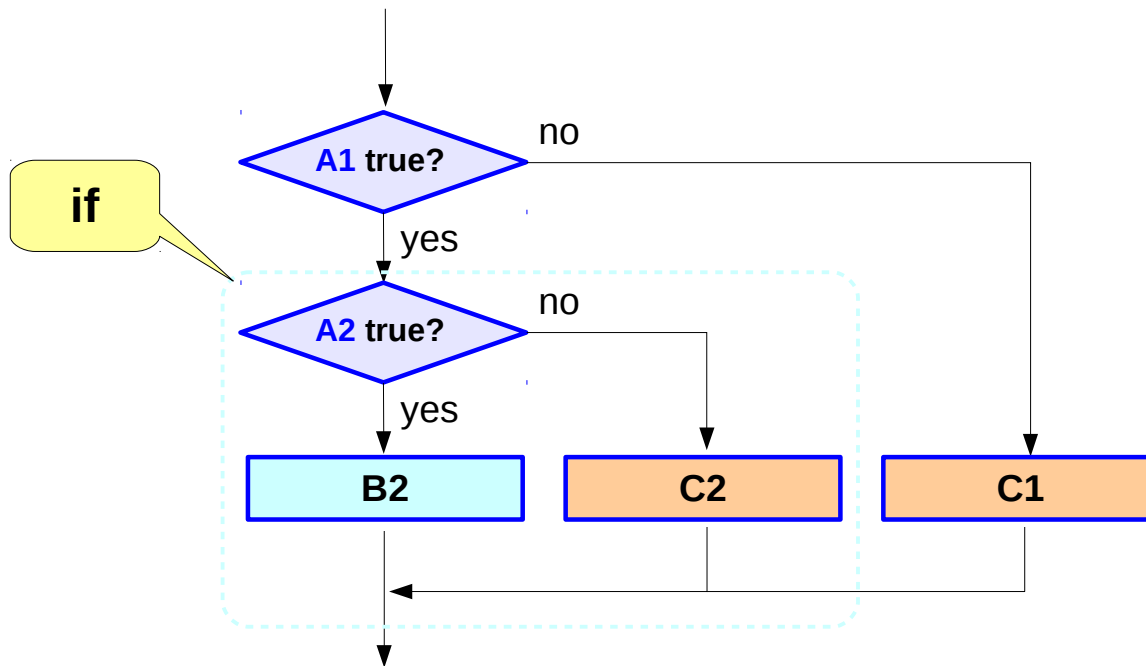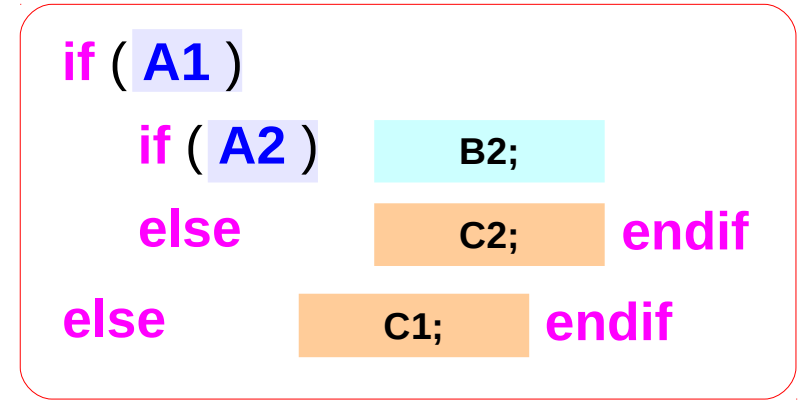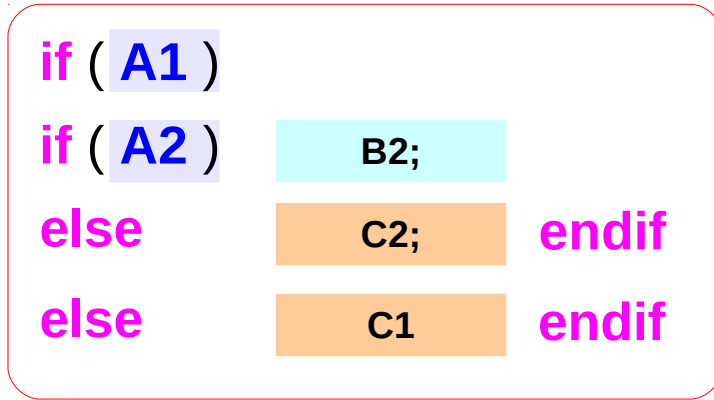
Nested **If** Statement (2)

if (**A1**)   ←   **if** (**A2**)   ←   **if** (**A3**)   **B3;**

else   **C1;**   **else**   **C2;**   **else**   **C3;**

A1

C1

A1·A2

C2

A1·A2·A3

C3

B3
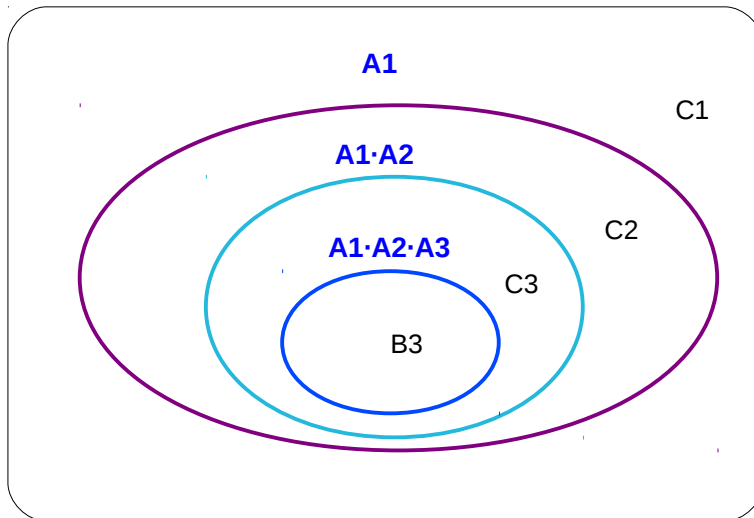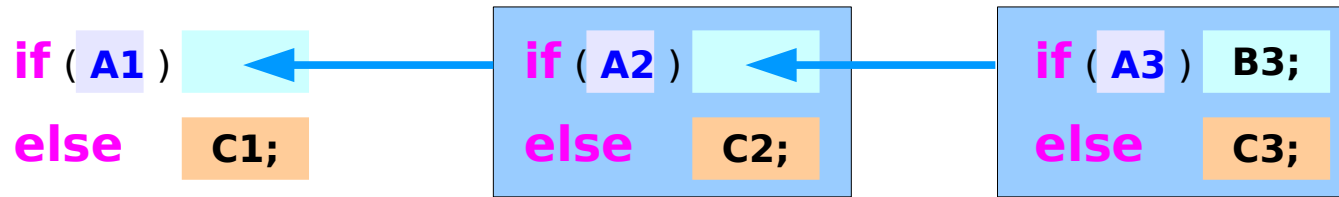
if (**A1**)

     if (**A2**)

         if (**A3**)   **B3**;

        else   **C3**;   **endif**

    else **C2**;   **endif**

else **C1**;   **endif**

if (**A1**)   B1;

else

if (**A2**)   B2;

else   C2;   **endif**

endif

➡

if (**A1**)   B1;

else if (**A2**)   B2;

    else   C2;

    endif

endif

A1 true? —no→ A2 true? —no→

yes ↓   yes ↓

B1   **B2**   **C2**

else

A1
(B1)

A2
(B2)

C2
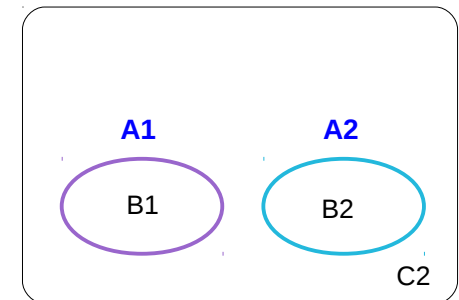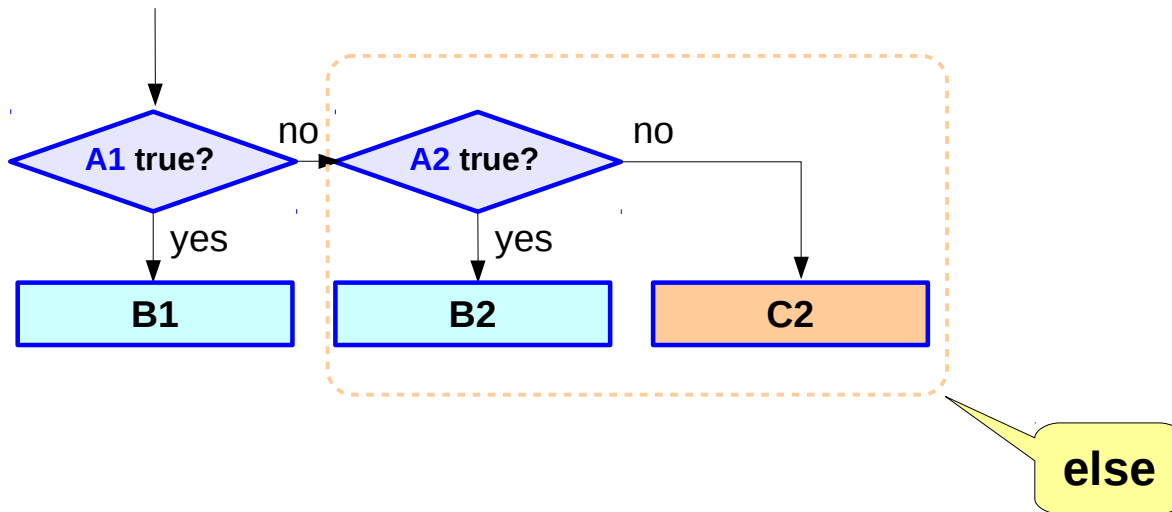
Nested **If** Statement (4)

if (**A1**)　**B1**

else　⬛　⟵━━━━

endif

if (**A2**)　**B2**

　else　⬛　⟵━━━━

　endif

　　if (**A3**)　**B3;**

　　else　**C3;**

　　endif

A1

B1

A2　　　　　C3

B2

A3

B3
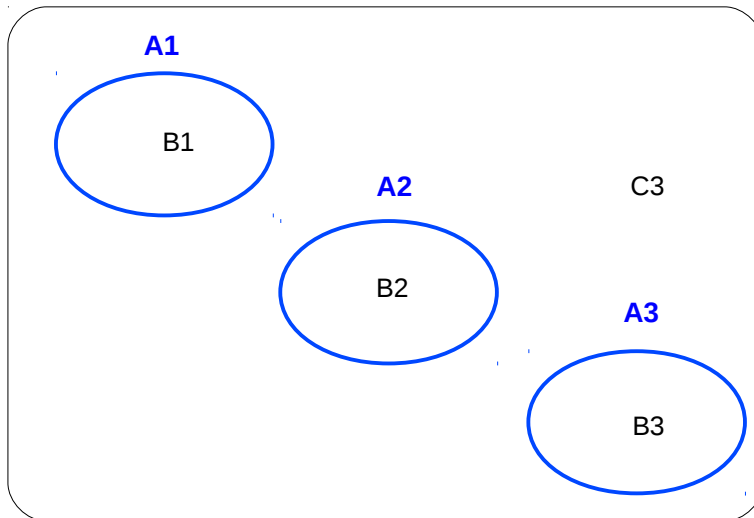
if (**A1**)　　　**B1**;
elseif (**A2**)　　**B2**;
elseif (**A3**)　　**B3**;
else　　　**C3**;
endif

~~**else** if~~

elseif

Switch Statement (1)

switch (**A**)

case A1:   **S1;**

case A2:   **S2;**
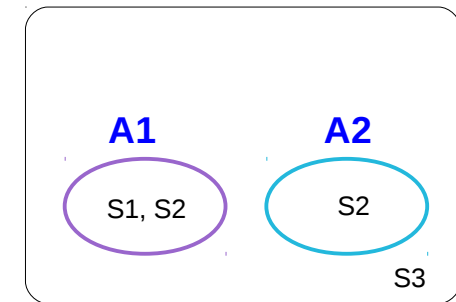
otherwise: **S3;**

endswitch

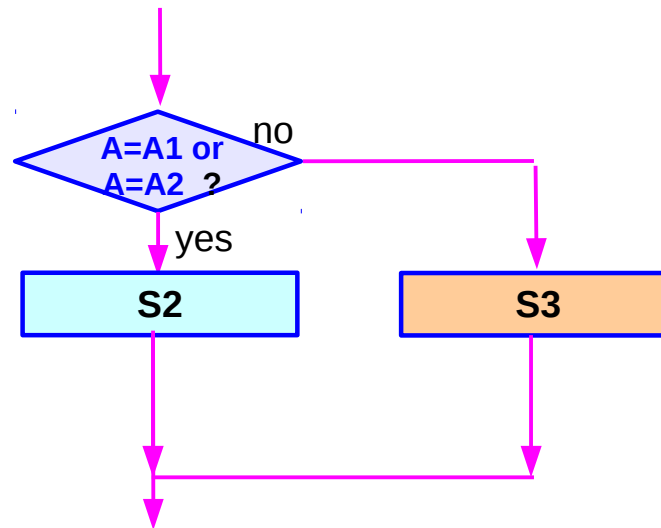Exclusive condition
No fall through
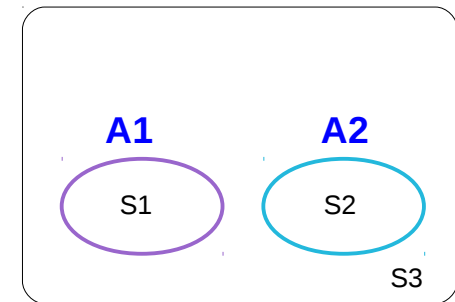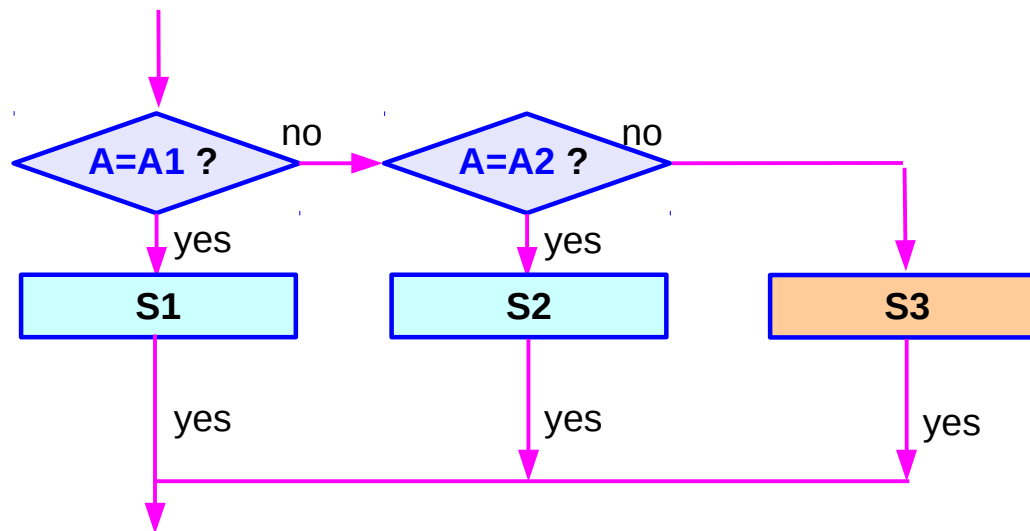
Switch Statement (2)

switch (**A**) **{**
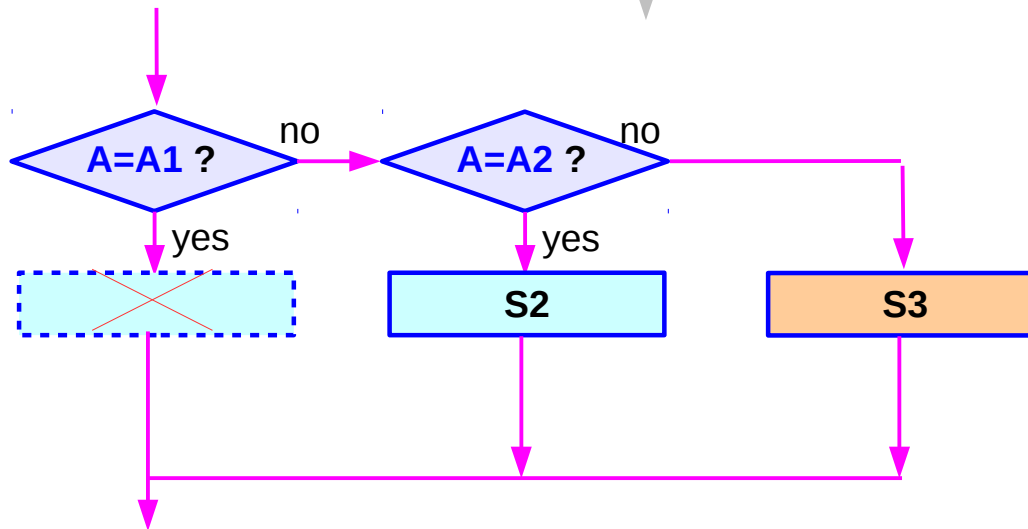
case { A1, A2} :   **S2;**

otherwise: **S3;**
endswitch
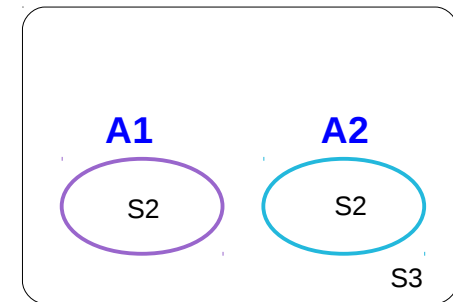
2-d Array

References

[1]   Essential C, Nick Parlante
[2]   Efficient C Programming, Mark A. Weiss
[3]   C A Reference Manual, Samuel P. Harbison & Guy L. Steele Jr.
[4] C Language Express, I. K. Chun