Still more choices with Mr C

ESC101: Fundamentals of Computing

Purushottam Kar

Announcements

- Institute holiday on August 22, 2018, Wednesday
    - No lecture, no lab on August 22
    - No extra lecture this week
- Extra lab for Wednesday batches B10, B11, B12, B14
    - Saturday, August 25, 2018, 2PM New Core Labs CC-01, CC-02
- Refer to course schedule calendar on website
  web.cse.iitk.ac.in/users/purushot/courses/esc/2018-19-a/material/schedule.pdf

Announcements

- Extra session for students facing trouble with English lectures but who are comfortable with Hindi
  - Saturday, August 25, 2018, 5PM-6:30PM, New Core Labs CC-02
  - Extra session to be held just after extra lab is over for B10, B11, B12, B14
- Students familiar with other Indian languages, please refer to document on website for names of admins
  web.cse.iitk.ac.in/users/purushot/courses/esc/2018-19-a/material/language.pdf

Announcements

- Major quiz next week – (syllabus till **Friday Aug 24**)
  - Wednesday, August 29, 2018, 12PM-12:50PM, L20 (i.e. lecture hour)
  - During lecture hours – don't be absent
  - **Bring your institute ID card** with you – will lose time if you forget
  - No minor quizzes during lab next week (August 27-August 30)
- Bring a **pencil, eraser and sharpener** with you
  - Answers to be written on question paper itself and returned back
  - If you make a mistake with pen – no extra question papers
  - If unsure, **first write answer with pencil** and **finally write it in pen**
  - We WONT HAVE EXTRA QUESTION PAPERS in case you spoil yours
  - We WONT HAVE PENCILS, ERASERS in case you forget

Revision – the two shades of if

Revision – the two shades of if

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if( ... ){
    ...
}
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Can put one or more statements here

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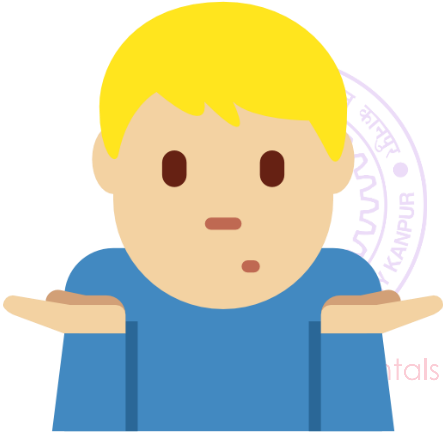

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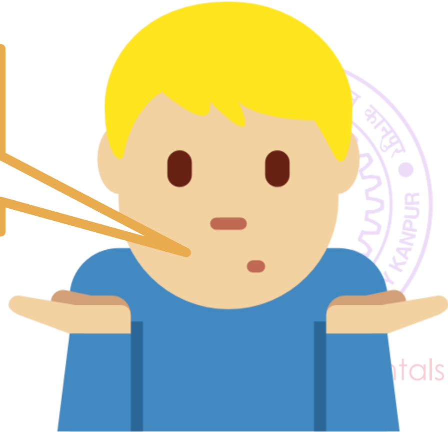
What all are valid statements?



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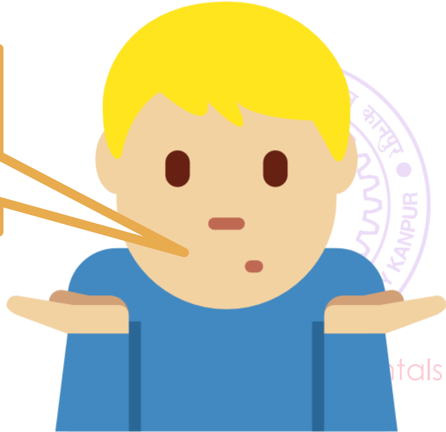

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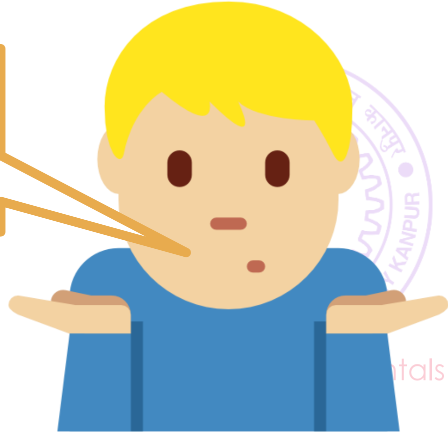

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- int a = 3, b;

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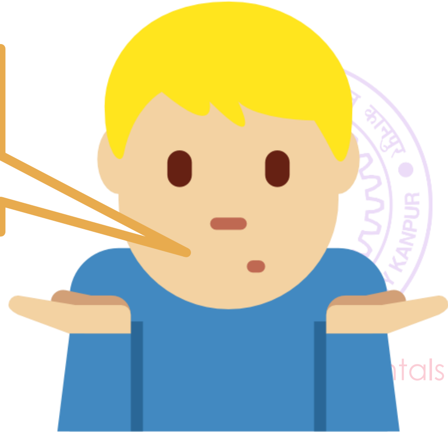

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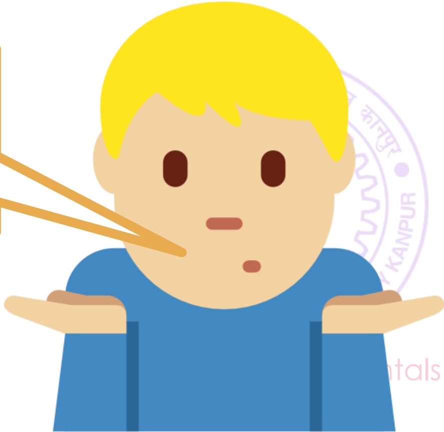

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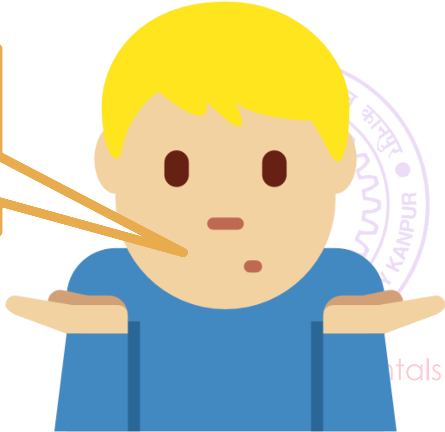

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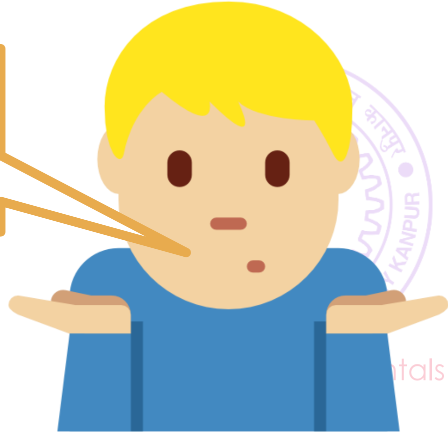

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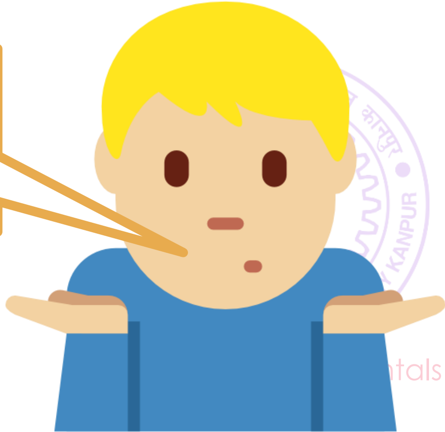

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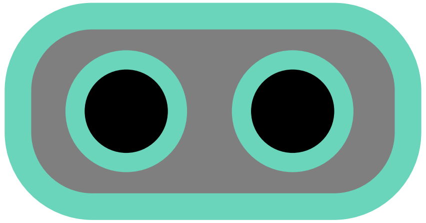

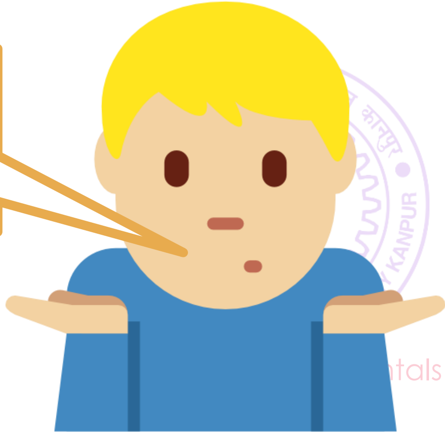

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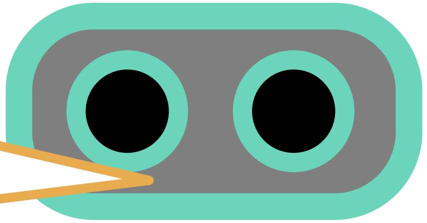
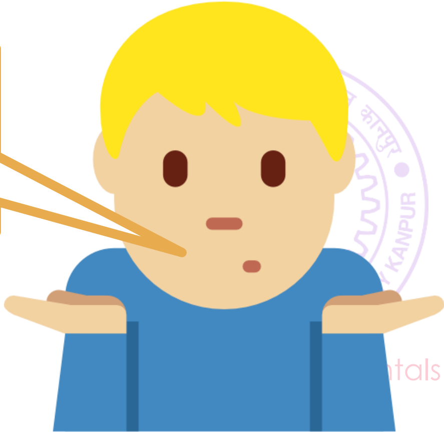


Don’t forget
if(…){ … } is itself a
single valid statement



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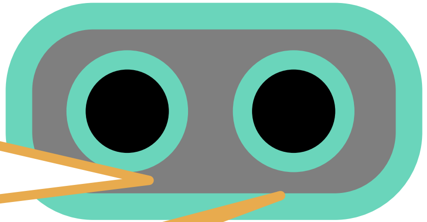
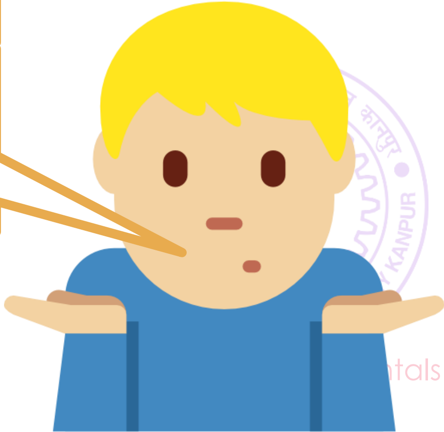


Don't forget if(…){ … } is itself a single valid statement

if(…){ … }else{ … } is also a single valid statement



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What all are valid statements?

Yes, we can nest if-else statements

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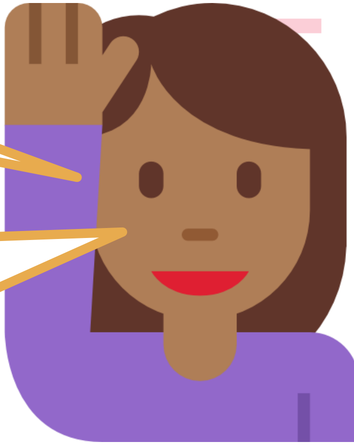

Oops, thanks for the reminder ☺

- int a = 3, b;
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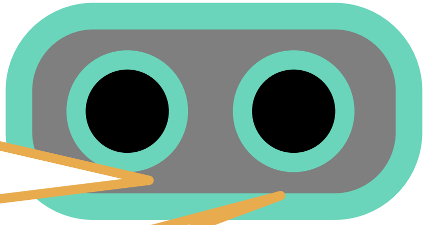
- etc. etc.



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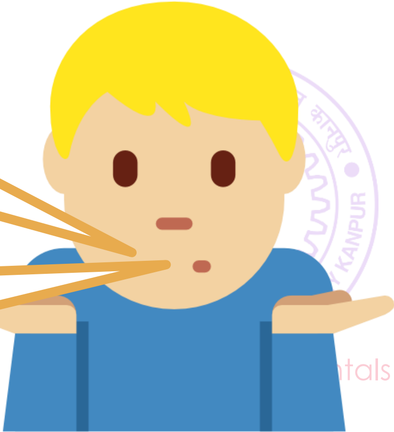

What all are valid statements?

Yes, we can nest if-else statements

Finding the smaller of two numbers

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Will learn a cute shortcut for very simple if-else statements

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```
int a = 5, b = 3, min;
```

Finding the smaller of two numbers

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```
int a = 5, b = 3, min;
if(a < b)
```

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int a = 5, b = 3, min;
if(a < b)
    min = a;
```

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int a = 5, b = 3, min;
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printf(“Minimum is %d”,min);
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min = (a < b)? a : b;
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Will learn a cute shortcut for very simple if-else statements

Called a *ternary conditional* operator

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Finding the smaller of two numbers

Will learn a cute shortcut for very simple if-else statements

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Just a shortcut, can be implemented exactly using if-else

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General form

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(relational expression)? expression1 : expression2

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If relational expression evaluates to true (1 or non-zero) then the value of expression1 is calculated and generated, otherwise value of expression 2 is calculated, generated

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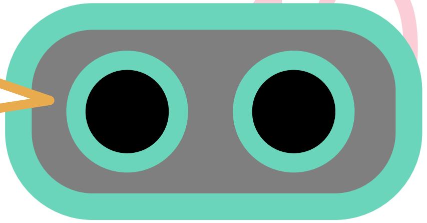

All expressions generate values

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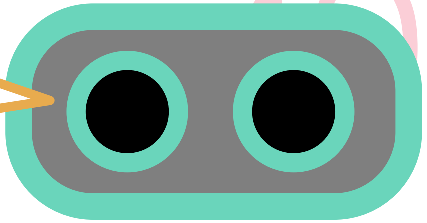

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Usually used in a statement along with assignment step

Ternary Conditional expression

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Usually used in a statement along with assignment step

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c = ((t >= 22) && (t <= 27))? (t + 1) : (t + 2);
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Ternary

Good idea to put brackets
Less confusion, less chance
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Exactly same output

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Avoid deep nesting – don't want shortcut to cause more difficulty

BODMAS table has more members

B embers

Operator Name	Symbol/Sign	Associativity
Bracket, Post increment/decrement	(), ++, --	Left
Unary negation, Pre increment/decrement, NOT	-, ++, --, !	Right
Multiplication/division/ remainder	*, /, %	Left
Addition/subtraction	+, -	Left
Relational	<, <=, >, >=	Left
Relational	==, !=	Left
AND	&&	Left
OR	||	Left
Ternary Conditional	**? :**	Right
Assignment, Compound assignment	=, +=, -=, *=, /=, %=	Right

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HIGH PRECEDENCE

LOW PRECEDENCE

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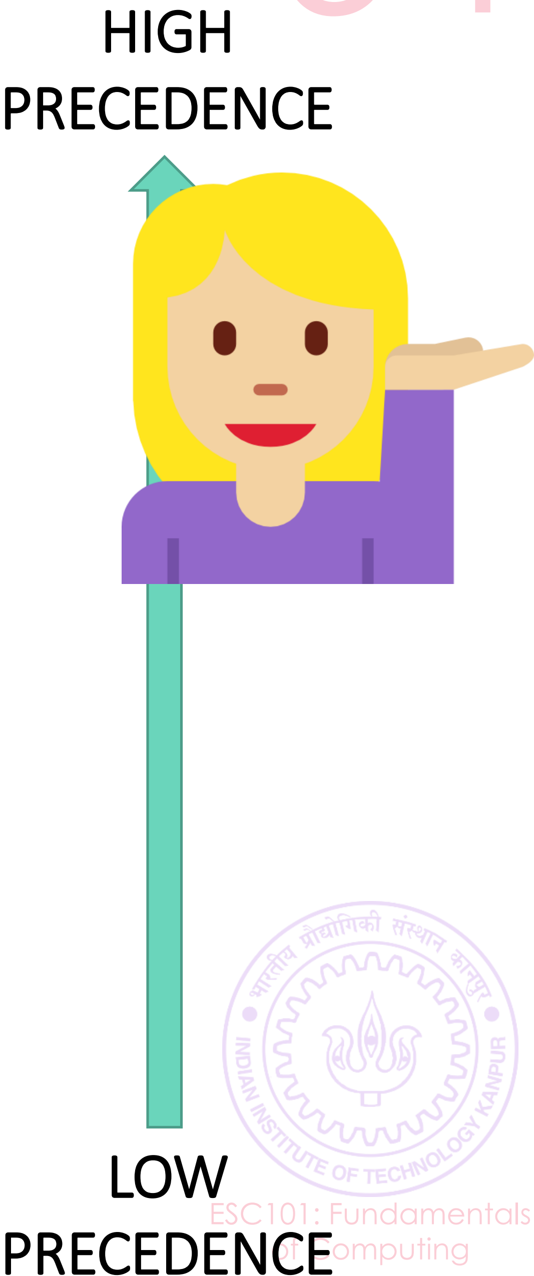

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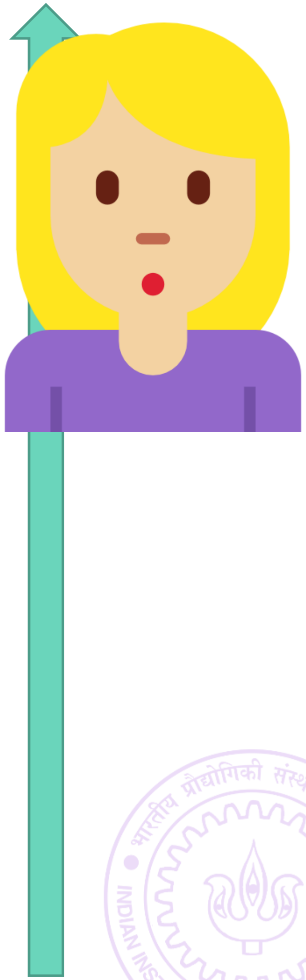

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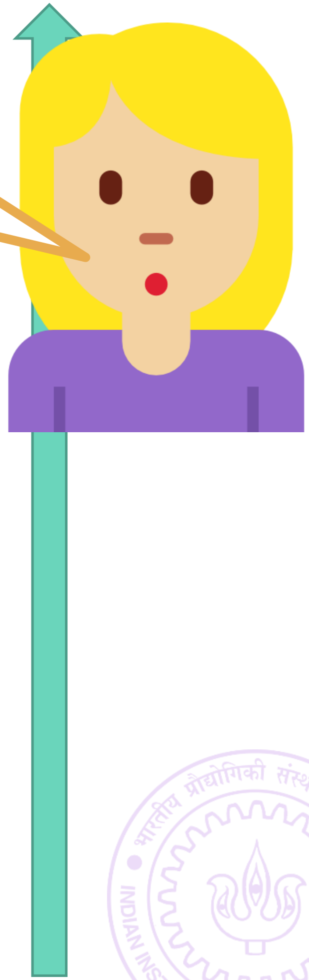
Multiplication/division/ remainder	*, /, %	
Addition/subtraction	+, -	Left
Relational	<, <=, >, >=	Left
Relational	==, !=	Left
AND	&&	Left
OR	||	Left
Ternary Conditional	**? :**	Right
Assignment, Compound assignment	=, +=, -=, *=, /=, %=	Right

HIGH PRECEDENCE



LOW PRECEDENCE

Print the name of day of the week

Print the name of day of the week

Print the name of day of the week

```
if(n == 1)
```

Print the name of day of the week

```
if(n == 1)

    printf(“Monday”);
```

Print the name of day of the week

```
if(n == 1)
    printf(“Monday”);
else if(n == 2)
```

Print the name of day of the week

```
if(n == 1)
   printf(“Monday”);
else if(n == 2)
   printf(“Tuesday”);
```

Print the name of day of the week

```
if(n == 1)
    printf(“Monday”);
else if(n == 2)
    printf(“Tuesday”);
else if(n == 3)
```

Print the name of day of the week

```
if(n == 1)
    printf(“Monday”);
else if(n == 2)
    printf(“Tuesday”);
else if(n == 3)
    printf(“Wednesday”);
```

Print the name of day of the week

```
if(n == 1)
    printf(“Monday”);
else if(n == 2)
    printf(“Tuesday”);
else if(n == 3)
    printf(“Wednesday”);
else if(n == 4)
```

Print the name of day of the week

```
if(n == 1)
   printf(“Monday”);
else if(n == 2)
   printf(“Tuesday”);
else if(n == 3)
   printf(“Wednesday”);
else if(n == 4)
   printf(“Thursday”);
```

Print the name of day of the week

```
if(n == 1)
   printf(“Monday”);
else if(n == 2)
   printf(“Tuesday”);
else if(n == 3)
   printf(“Wednesday”);
else if(n == 4)
   printf(“Thursday”);
else if(n == 5)
```

Print the name of day of the week

```
if(n == 1)
    printf(“Monday”);
else if(n == 2)
    printf(“Tuesday”);
else if(n == 3)
    printf(“Wednesday”);
else if(n == 4)
    printf(“Thursday”);
else if(n == 5)
    printf(“Friday”);
```

Print the name of day of the week

```
if(n == 1)
   printf(“Monday”);
else if(n == 2)
   printf(“Tuesday”);
else if(n == 3)
   printf(“Wednesday”);
else if(n == 4)
   printf(“Thursday”);
else if(n == 5)
   printf(“Friday”);
else if(n == 6)
```

Print the name of day of the week

```
if(n == 1)
    printf(“Monday”);
else if(n == 2)
    printf(“Tuesday”);
else if(n == 3)
    printf(“Wednesday”);
else if(n == 4)
    printf(“Thursday”);
else if(n == 5)
    printf(“Friday”);
else if(n == 6)
    printf(“Saturday”);
```

Print the name of day of the week

```
if(n == 1)
   printf(“Monday”);
else if(n == 2)
   printf(“Tuesday”);
else if(n == 3)
   printf(“Wednesday”);
else if(n == 4)
   printf(“Thursday”);
else if(n == 5)
   printf(“Friday”);
else if(n == 6)
   printf(“Saturday”);
else if(n == 7)
```

Print the name of day of the week

```
if(n == 1)
    printf("Monday");
else if(n == 2)
    printf("Tuesday");
else if(n == 3)
    printf("Wednesday");
else if(n == 4)
    printf("Thursday");
else if(n == 5)
    printf("Friday");
else if(n == 6)
    printf("Saturday");
else if(n == 7)
    printf("Sunday");
```

Print the name of day of the week

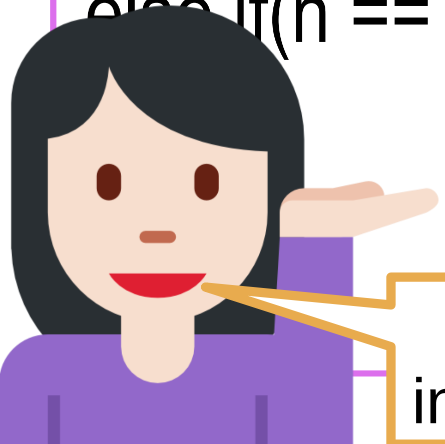
```
if(n == 1) printf(“Monday”);
else if(n == 2) printf(“Tuesday”);
else if(n == 3) printf(“Wednesday”);
else if(n == 4) printf(“Thursday”);
else if(n == 5) printf(“Friday”);
else if(n == 6) printf(“Saturday”);
else if(n == 7) printf(“Sunday”);
```

Print the name of day of the week

```
if(n == 1) printf(“Monday”);
else if(n == 2) printf(“Tuesday”);
else if(n == 3) printf(“Wednesday”);
else if(n == 4) printf(“Thursday”);
else if(n == 5) printf(“Friday”);
else if(n == 6) printf(“Saturday”);
else if(n == 7) printf(“Sunday”);
```

Print the name of day of the week

```
if(n == 1) printf(“Monday”);
else if(n == 2) printf(“Tuesday”);
else if(n == 3) printf(“Wednesday”);
else if(n == 4) printf(“Thursday”);
else if(n == 5) printf(“Friday”);
else if(n == 6) printf(“Saturday”);
else if(n == 7) printf(“Sunday”);
```



Sometimes not indenting looks neater

Print the name of day of the week

```
if(n == 1) printf(“Monday”);
else if(n == 2) printf(“Tuesday”);
else if(n == 3) printf(“Wednesday”);
else if(n == 4) printf(“Thursday”);
else if(n == 5) printf(“Friday”);
else if(n == 6) printf(“Saturday”);
else if(n == 7) printf(“Sunday”);
```

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Print the name of day of the week

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if(n == 1) printf(“Monday”);
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else if(n == 4) printf(“Thursday”);
else if(n == 5) printf(“Friday”);
else if(n == 6) printf(“Saturday”);
else if(n == 7) printf(“Sunday”);
```

Still too much code – any shortcuts?

Sometimes not indenting looks neater

Print the name of day of the week

```
if(n == 1) printf(“Monday”);
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else if(n == 3) printf(“Wednesday”);
else if(n == 4) printf(“Thursday”);
else if(n == 5) printf(“Friday”);
else if(n == 6) printf(“Saturday”);
else if(n == 7) printf(“Sunday”);
```

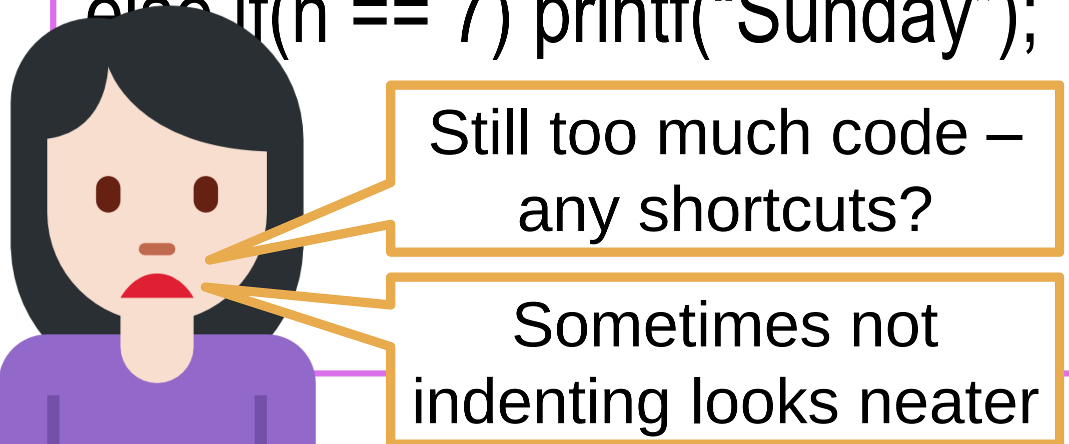
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Sometimes not indenting looks neater

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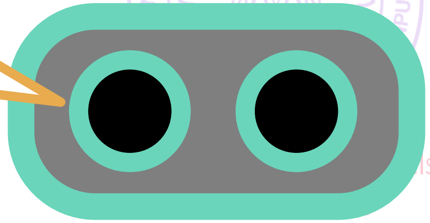
else if(n == 4) printf(“Thursday”);
else if(n == 5) printf(“Friday”);
else if(n == 6) printf(“Saturday”);
else if(n == 7) printf(“Sunday”);
```

Still too much code – any shortcuts?

Sometimes not indenting looks neater



The switch statement

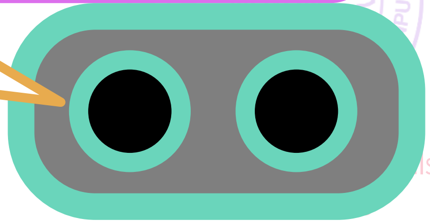
Print the name of day of the week

```
if(n == 1) printf("Monday");
else if(n == 2) printf("Tuesday");
else if(n == 3) printf("Wednesday");
else if(n == 4) printf("Thursday");
else if(n == 5) printf("Friday");
else if(n == 6) printf("Saturday");
else if(n == 7) printf("Sunday");
```

```
switch(n){
```

Still too much code – any shortcuts?

Sometimes not indenting looks neater



The switch statement

Print the name of day of the week

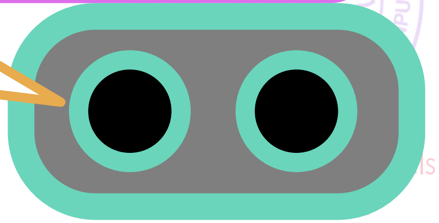
```
if(n == 1) printf(“Monday”);
else if(n == 2) printf(“Tuesday”);
else if(n == 3) printf(“Wednesday”);
else if(n == 4) printf(“Thursday”);
else if(n == 5) printf(“Friday”);
else if(n == 6) printf(“Saturday”);
else if(n == 7) printf(“Sunday”);
```

```
switch(n){
    case 1: printf(“Monday”); break;
```

Still too much code – any shortcuts?

Sometimes not indenting looks neater

The switch statement



Print the name of day of the week

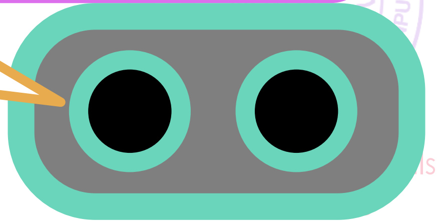
```
if(n == 1) printf("Monday");
else if(n == 2) printf("Tuesday");
else if(n == 3) printf("Wednesday");
else if(n == 4) printf("Thursday");
else if(n == 5) printf("Friday");
else if(n == 6) printf("Saturday");
else if(n == 7) printf("Sunday");
```

```
switch(n){
    case 1: printf("Monday"); break;
    case 2: printf("Tuesday"); break;
```

Still too much code – any shortcuts?

Sometimes not indenting looks neater

The switch statement



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else if(n == 3) printf("Wednesday");
else if(n == 4) printf("Thursday");
else if(n == 5) printf("Friday");
else if(n == 6) printf("Saturday");
else if(n == 7) printf("Sunday");
```
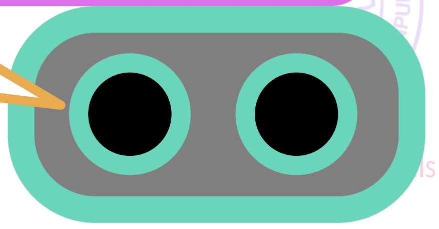

```
switch(n){
    case 1: printf("Monday"); break;
    case 2: printf("Tuesday"); break;
    case 3: printf("Wednesday"); break;
```

Still too much code – any shortcuts?

Sometimes not indenting looks neater



The switch statement

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if(n == 1) printf("Monday");
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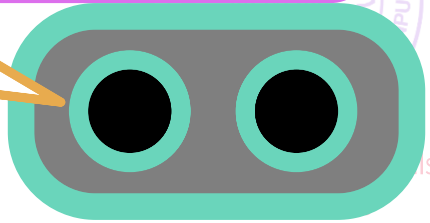
else if(n == 4) printf("Thursday");
else if(n == 5) printf("Friday");
else if(n == 6) printf("Saturday");
else if(n == 7) printf("Sunday");
```

```
switch(n){
    case 1: printf("Monday"); break;
    case 2: printf("Tuesday"); break;
    case 3: printf("Wednesday"); break;
    case 4: printf("Thursday"); break;
```

Still too much code – any shortcuts?

Sometimes not indenting looks neater



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Print the name of day of the week

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else if(n == 5) printf(“Friday”);
else if(n == 6) printf(“Saturday”);
else if(n == 7) printf(“Sunday”);
```
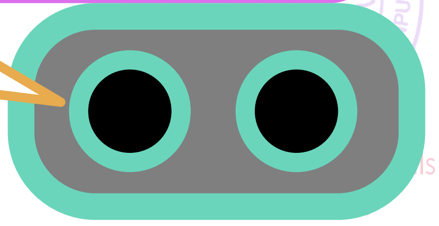

Still too much code – any shortcuts?

Sometimes not indenting looks neater

```
switch(n){
    case 1: printf(“Monday”); break;
    case 2: printf(“Tuesday”); break;
    case 3: printf(“Wednesday”); break;
    case 4: printf(“Thursday”); break;
    case 5: printf(“Friday”); break;
```



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else if(n == 6) printf(“Saturday”);
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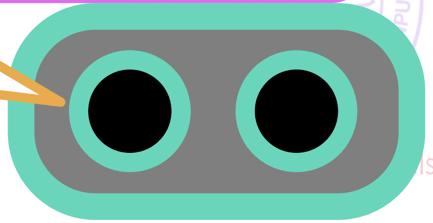
```

```
switch(n){
    case 1: printf(“Monday”); break;
    case 2: printf(“Tuesday”); break;
    case 3: printf(“Wednesday”); break;
    case 4: printf(“Thursday”); break;
    case 5: printf(“Friday”); break;
    case 6: printf(“Saturday”); break;
```

Still too much code – any shortcuts?

Sometimes not indenting looks neater



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Print the name of day of the week

```
if(n == 1) printf(“Monday”);
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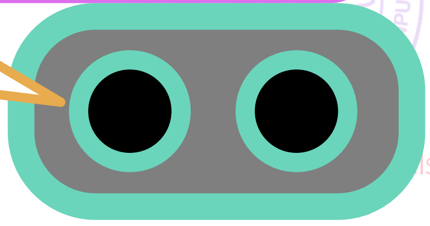
else if(n == 5) printf(“Friday”);
else if(n == 6) printf(“Saturday”);
else if(n == 7) printf(“Sunday”);
```

```
switch(n){
    case 1: printf(“Monday”); break;
    case 2: printf(“Tuesday”); break;
    case 3: printf(“Wednesday”); break;
    case 4: printf(“Thursday”); break;
    case 5: printf(“Friday”); break;
    case 6: printf(“Saturday”); break;
    case 7: printf(“Sunday”); break;
```

Still too much code – any shortcuts?

Sometimes not indenting looks neater



The switch statement

Print the name of day of the week

```
if(n == 1) printf(“Monday”);
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else if(n == 5) printf(“Friday”);
else if(n == 6) printf(“Saturday”);
else if(n == 7) printf(“Sunday”);
```

```
switch(n){
    case 1: printf(“Monday”); break;
    case 2: printf(“Tuesday”); break;
    case 3: printf(“Wednesday”); break;
    case 4: printf(“Thursday”); break;
    case 5: printf(“Friday”); break;
    case 6: printf(“Saturday”); break;
    case 7: printf(“Sunday”); break;
}
```

Still too much code – any shortcuts?

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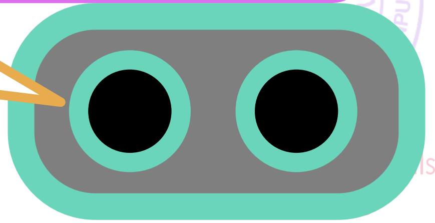

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```

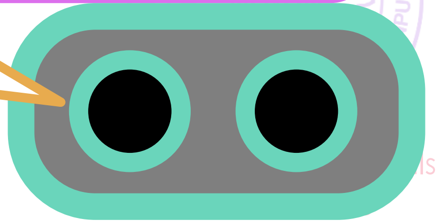
```
switch(n){
    case 1: printf(“Monday”); break;
    case 2: printf(“Tuesday”); break;
    case 3: printf(“Wednesday”); break;
    case 4: printf(“Thursday”); break;
    case 5: printf(“Friday”); break;
    case 6: printf(“Saturday”); break;
    case 7: printf(“Sunday”); break;
}
```

Still too much code – any shortcuts?

Sometimes not indenting looks neater

This whole *block* is one valid statement

The switch statement



Print the name of day of the week

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if(n == 1) printf(“Monday”);
else if(n == 2) printf(“Tuesday”);
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```

```
switch(n){
    case 1: printf(“Monday”); break;
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    case 3: printf(“Wednesday”); break;
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    case 5: printf(“Friday”); break;
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```

Still too much code – any shortcuts?

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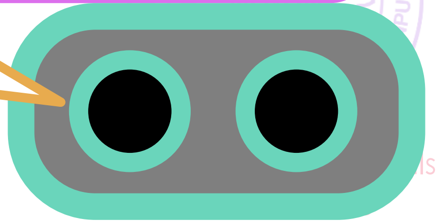

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```
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else if(n == 4) printf(“Thursday”);
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else if(n == 6) printf(“Saturday”);
else if(n =
```

```
switch(n){
    case 1: printf(“Monday”); break;
    case 2: printf(“Tuesday”); break;
    case 3: printf(“Wednesday”); break;
    case 4: printf(“Thursday”); break;
    case 5: printf(“Friday”); break;
    case 6: printf(“Saturday”); break;
    case 7: printf(“Sunday”); break;
}
```

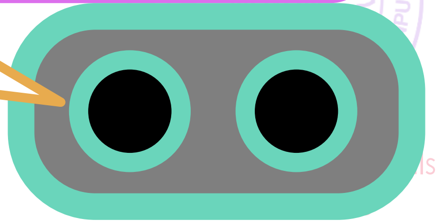
Just like if-else block is a single statement!

Still too much code – any shortcuts?

Sometimes not indenting looks neater

This whole *block* is one valid statement

The switch statement



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```
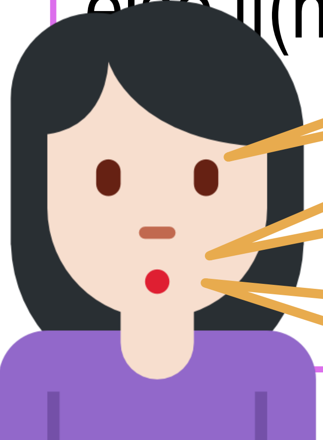

```
switch(n){
    case 1: printf(“Monday”); break;
    case 2: printf(“Tuesday”); break;
    case 3: printf(“Wednesday”); break;
    case 4: printf(“Thursday”); break;
    case 5: printf(“Friday”); break;
    case 6: printf(“Saturday”); break;
    case 7: printf(“Sunday”); break;
}
```



Just like if-else block is a single statement!

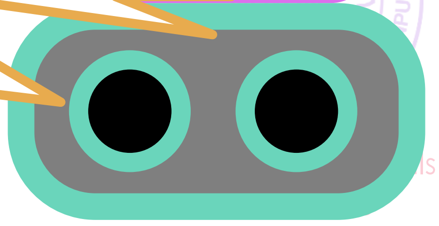
Still too much code – any shortcuts?

Sometimes not indenting looks neater

This whole *block* is one valid statement

Yes, can use switch inside if,else

The switch statement



The structure of a switch statement

The structure of a switch statement

```
switch(integer expression){
    case label1: ... break;
    case label2: ... break;
    ...
    case labelk: ... break;
    default: ... break;
}
```

The structure of a switch statement

```
switch(integer expression){
    case label1: ... break;
    case label2: ... break;
    ...
    case labelk: ... break;
    default: ... break;
}
```

Careful about brackets

The structure of a switch statement

Must be an integer expression, e.g a, b+2, c*3 where a,b,c are int

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    ...
    case labelk: ... break;
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Double, float expressions banned

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For relational expressions, Mr C will warn but work

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    case label2: ... break;
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    case labelk: ... break;
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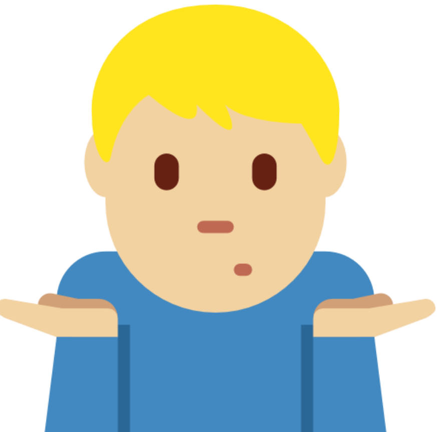
    case label2: ... break;
    ...
    case labelk: ... break;
    default: ... break;
}
```

Careful about brackets



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    ...
    case labelk: ... break;
    default: ... break;
}
```
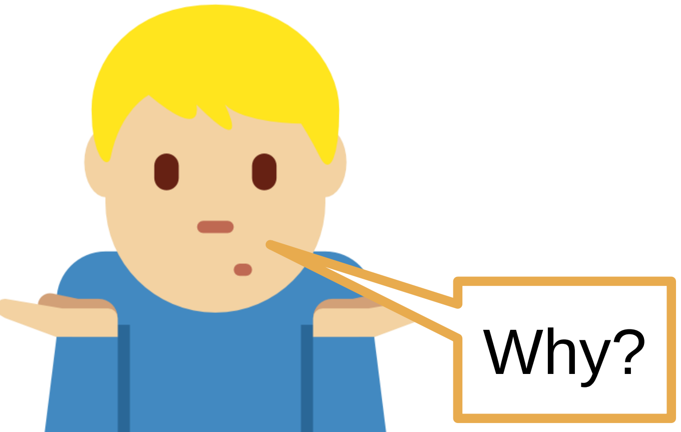

Careful about brackets



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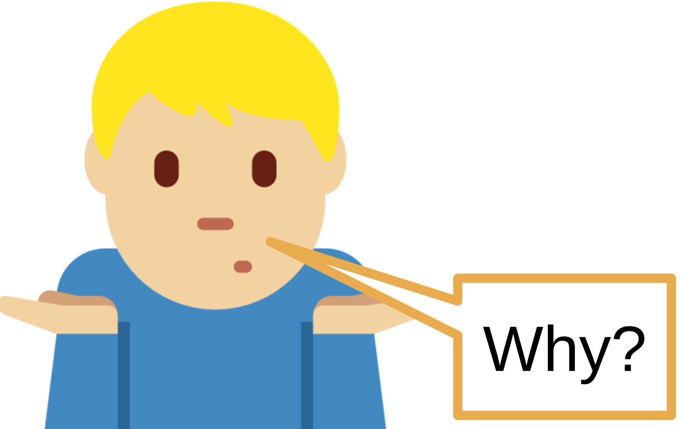

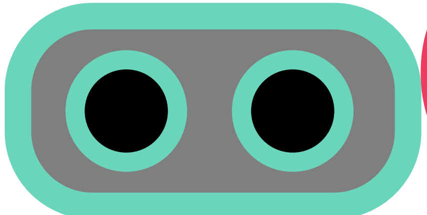

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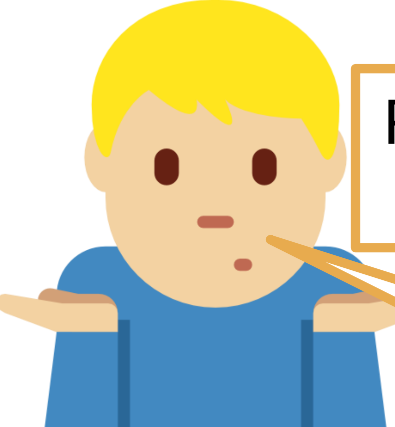

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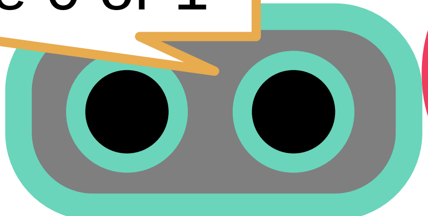

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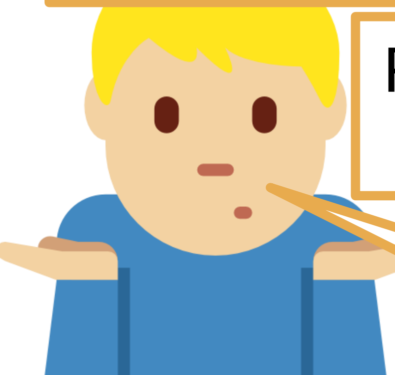

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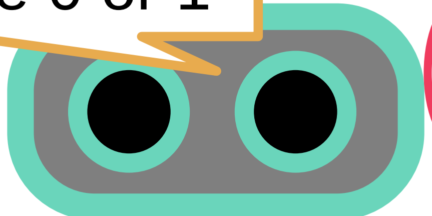

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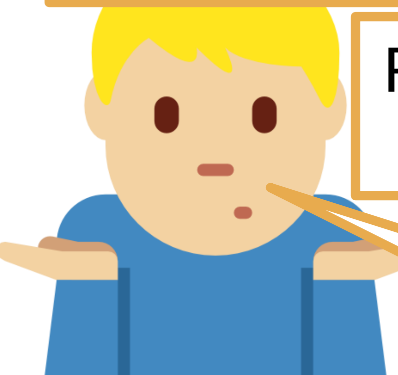

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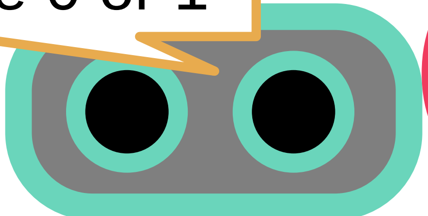

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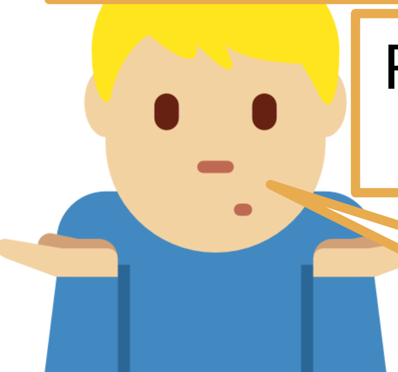

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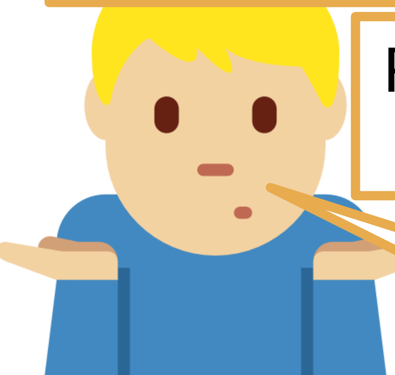

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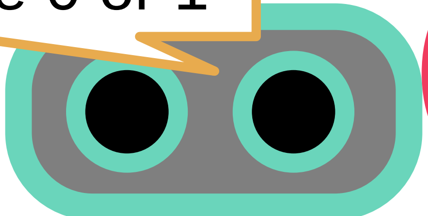

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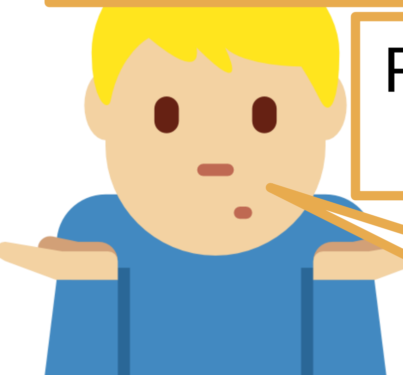

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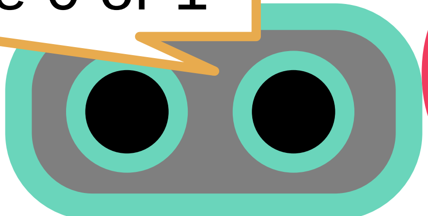

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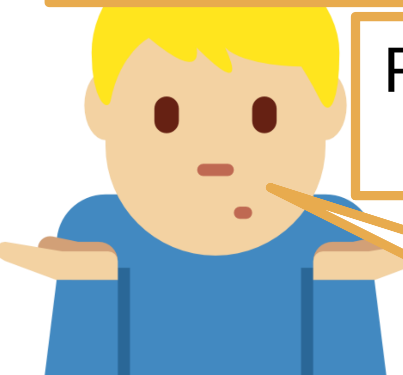

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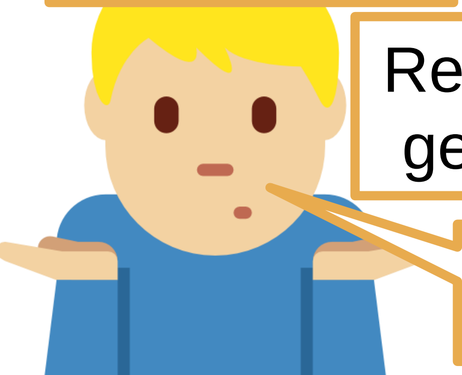

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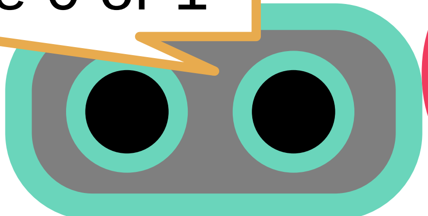

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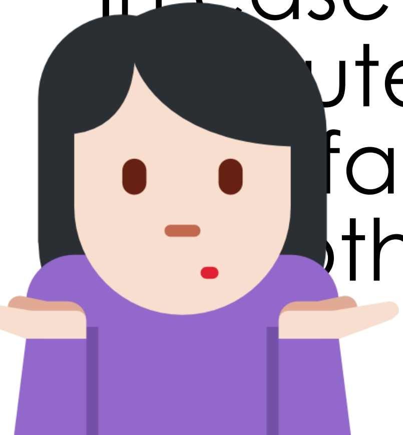

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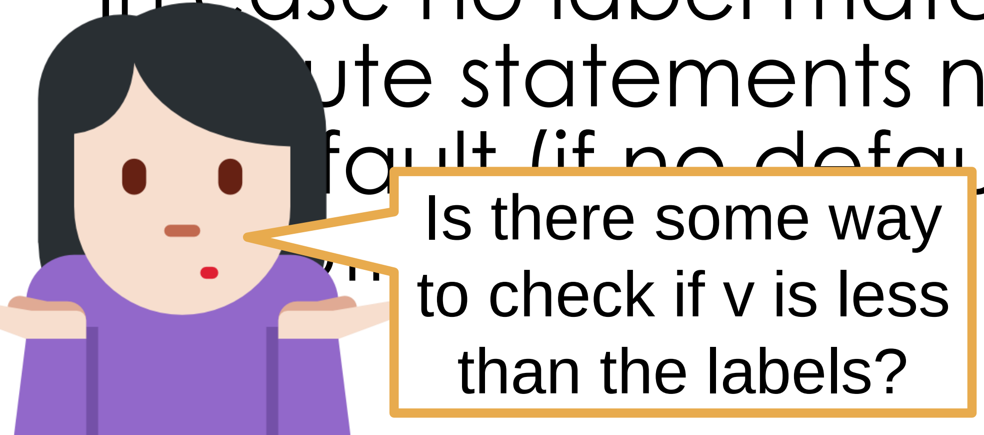

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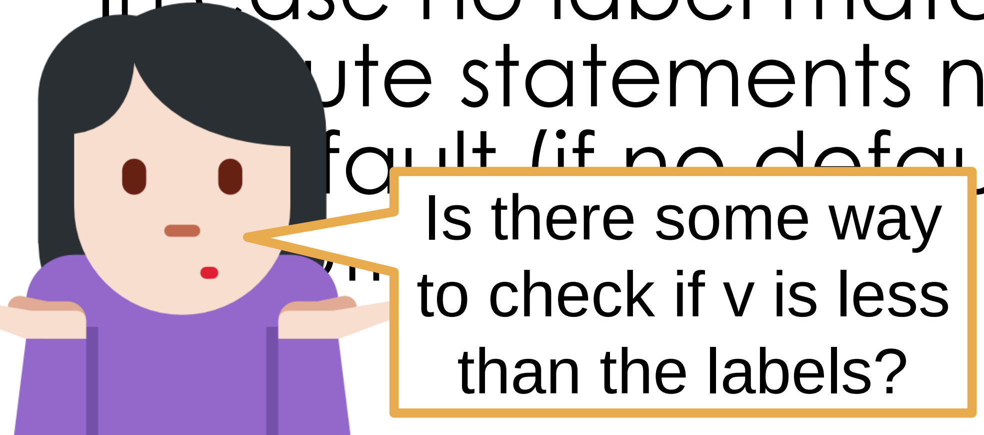

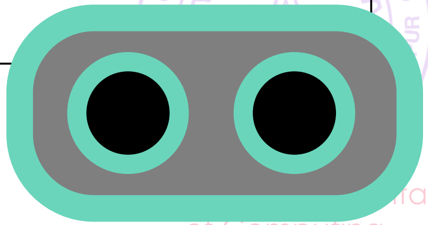

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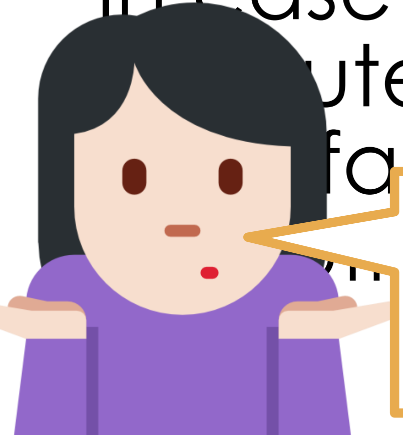
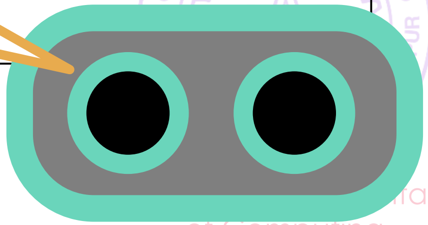


Is there some way to check if v is less than the labels?



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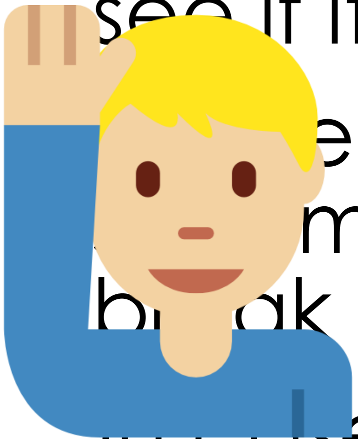

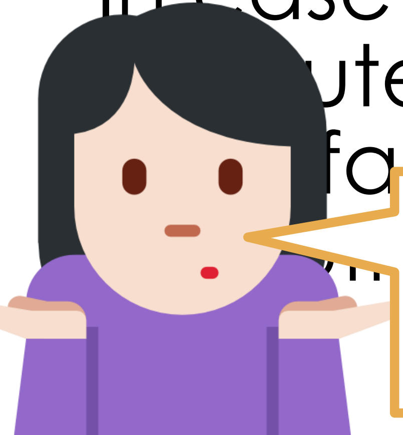

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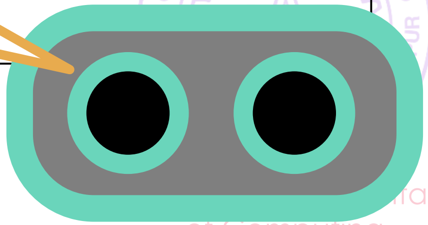

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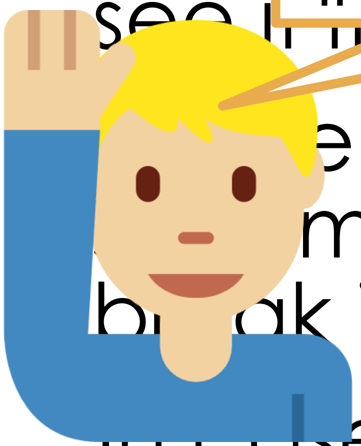

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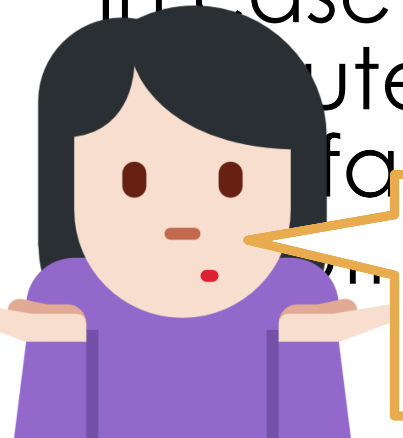

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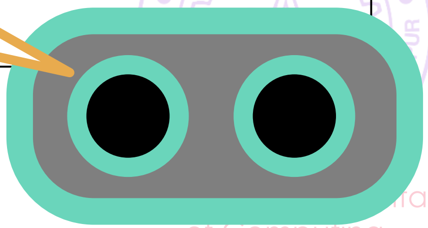

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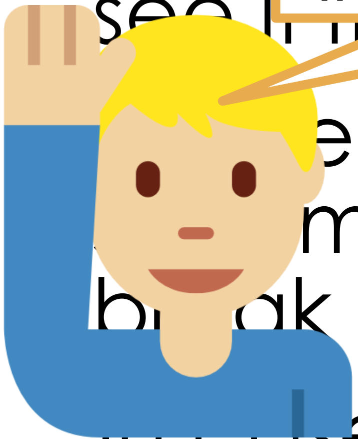

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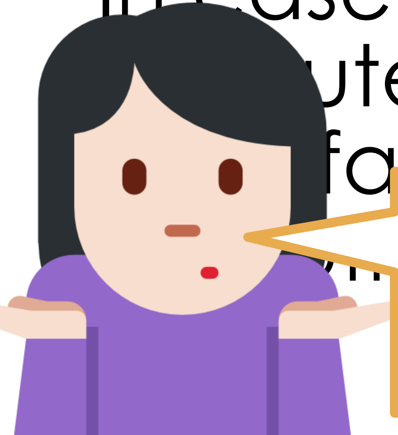

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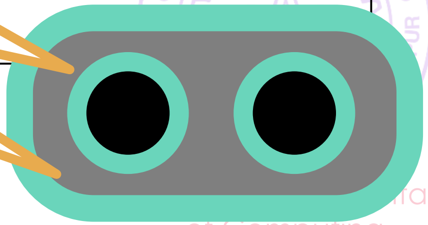

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Need not put default case at all. If we don’t put a default case, Mr C will do nothing if no labels match

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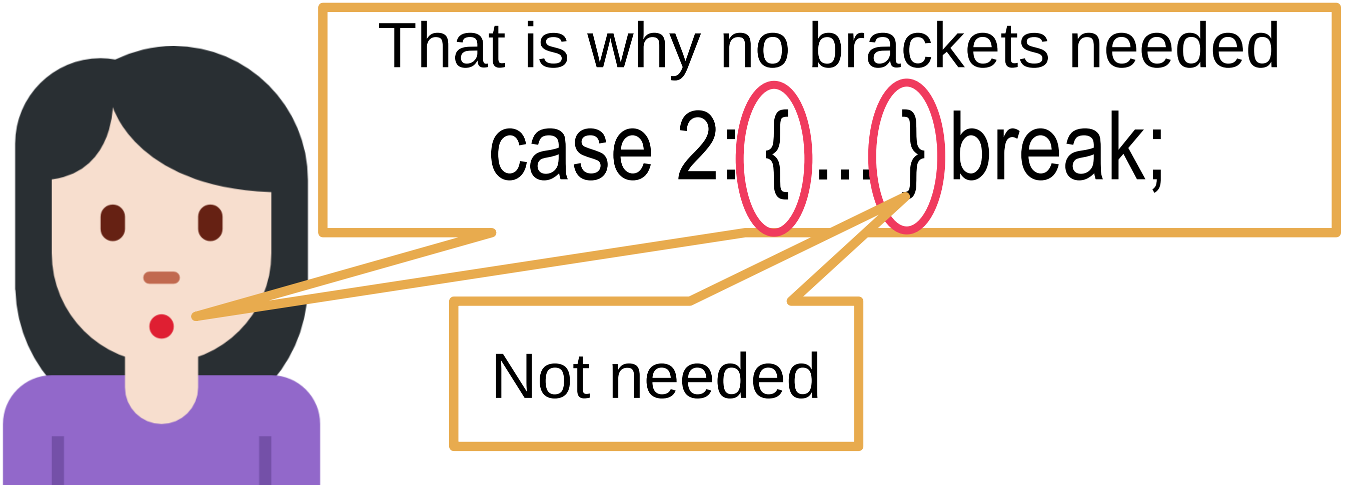

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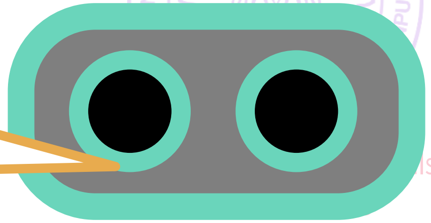

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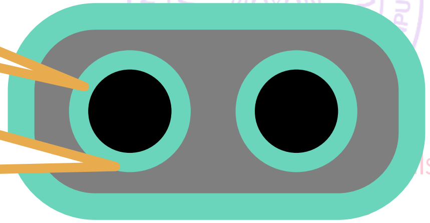

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Let us see an example

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