

Elif/Else Statements

Textbook

Elif/Else Statements



Elif Statement

Let's say you want something to happen if you press the **A button**. But then you want something else to happen if you press the **B button**. This is where the elif statement is useful.

Elif is short for "else if". In Python, the correct way to write this is `elif`.

Let's say you want the `HAPPY` icon to show if the A button is pressed. Else if the B button is pressed, you want the `HEART` icon to show.

```
1 def on_forever():
2     if input.button_is_pressed(Button.A):
3         basic.show_icon(IconNames.HAPPY)
4     elif input.button_is_pressed(Button.B):
5         basic.show_icon(IconNames.HEART)
6
7 basic.forever(on_forever)
8
```

Notice that the **INDENTATION MATTERS!** The code you want to run after the IF or the ELIF statements must all be indented in using the TAB key.

Else Statement

Now that we know how to add an if statement, what do you want to happen if the buttons aren't being pressed? This is where an else statement comes in.

Now let's add an else statement that runs if the button is not pressed. Use the following code.

```
1 def on_forever():
2     if input.button_is_pressed(Button.A):
3         basic.show_icon(IconNames.HAPPY)
4     elif input.button_is_pressed(Button.B):
5         basic.show_icon(IconNames.HEART)
6     else:
7         basic.show_icon(IconNames.GIRAFFE)
8 basic.forever(on_forever)
9
```

With this code, the **HAPPY** icon will show if you press the **A button**. The **HEART** icon will show if you press the **B button**. If you aren't pressing the A or B buttons, the **GIRAFFE** icon will show.

Since this code is constantly running with the forever function, if you want the HAPPY or HEART icons to show, you will need to **press and hold the A or B buttons**.

Adopted from microbit.org platform

Critical Thinking Questions

- Imagine you're programming a smart traffic light at a complex intersection with multiple turns. How would you use a series of "if," "else if," and "else" choices to make sure the traffic light changes correctly for different traffic conditions (e.g., heavy traffic straight, light traffic turning right, or no cars at all)?
- In real life, people often make decisions using a similar "if... else if... else..." pattern. Describe a situation where you or someone you know had to make a choice based on several different conditions, and what happened if none of the specific conditions were met.
- Why is it important for a computer program to have a default action or "else" condition when no other specific conditions are met? What might happen in a system like a security alarm if it only had "if" conditions but no "else" to cover all other possibilities?

Questions (10)

MULTIPLE CHOICE

1. What will happen when you run this code and press button A?

```
def on_forever(): if input.button_is_pressed(Button.A): basic.show_icon(IconNames.HAPPY) elif
input.button_is_pressed(Button.B): basic.show_icon(IconNames.HEART) else: basic.show_icon(IconNames.GIRAFFE)
basic.forever(on_forever)
```

Choose the correct answer:

- A. The HEART icon shows
- B. The GIRAFFE icon shows
- C. The HAPPY icon shows
- D. No icon shows

MULTIPLE CHOICE

2. What icon will show when you run this code without pressing any buttons?

```
def on_forever(): if input.button_is_pressed(Button.A): basic.show_icon(IconNames.HAPPY) elif
input.button_is_pressed(Button.B): basic.show_icon(IconNames.HEART) else: basic.show_icon(IconNames.GIRAFFE)
basic.forever(on_forever)
```

Choose the correct answer:

- A. HAPPY icon
- B. HEART icon
- C. GIRAFFE icon
- D. No icon shows

MULTIPLE CHOICE

3. A student writes this code but forgets proper indentation. What will happen?

```
def on_forever(): if input.button_is_pressed(Button.A): basic.show_icon(IconNames.HAPPY) elif
input.button_is_pressed(Button.B): basic.show_icon(IconNames.HEART) else: basic.show_icon(IconNames.GIRAFFE)
basic.forever(on_forever)
```

Choose the correct answer:

- A. The code works perfectly
- B. Only the GIRAFFE icon shows
- C. The code will have an error
- D. Only the HAPPY icon shows

4. You want the GHOST icon to show only when either button A or button B are pressed. How would you write this condition?

MULTIPLE CHOICE

Choose the correct answer:

- A. if input.button_is_pressed(Button.A) or input.button_is_pressed(Button.B):
- B. if input.button_is_pressed(Button.A) and input.button_is_pressed(Button.B):
- C. elif input.button_is_pressed(Button.A) + input.button_is_pressed(Button.B):
- D. else input.button_is_pressed(Button.A) input.button_is_pressed(Button.B):

5. What is wrong with this code structure?

MULTIPLE CHOICE

```
def on_forever(): if input.button_is_pressed(Button.A): basic.show_icon(IconNames.HAPPY) else:  
basic.show_icon(IconNames.GIRAFFE) elif input.button_is_pressed(Button.B): basic.show_icon(IconNames.HEART)  
basic.forever(on_forever)
```

Choose the correct answer:

- A. The indentation is wrong
- B. The elif comes after the else statement
- C. Missing button check
- D. Wrong icon names

6. A student wants the SKULL icon to show when button A is pressed, but wants nothing to happen for other buttons. What code structure should they use?

MULTIPLE CHOICE

Choose the correct answer:

- A. if, elif, else
- B. if, else
- C. if
- D. elif, else

7. In this code, what happens when you press and quickly release button A?

```
def on_forever(): if input.button_is_pressed(Button.A): basic.show_icon(IconNames.HAPPY) elif  
input.button_is_pressed(Button.B): basic.show_icon(IconNames.HEART) else: basic.show_icon(IconNames.GIRAFFE)  
basic.forever(on_forever)
```

Choose the correct answer:

- A. HAPPY icon stays on screen
- B. GIRAFFE icon shows after you release the button
- C. HEART icon shows
- D. Screen goes blank

8. You want to create a simple menu system where button A shows "Option 1", button B shows "Option 2", and no buttons show "Select Option". Which statement type do you need?

MULTIPLE CHOICE

Choose the correct answer:

- A. Only if statements
- B. Only else statements
- C. if, elif, and else statements
- D. Only elif statements

9. What does "elif" stand for and when do you use it?**Choose the correct answer:**

- A. Else if - use it for the last condition in your code
- B. Else if - use it to add more conditions after the first if statement
- C. End if - use it to close an if statement
- D. Extra if - use it instead of an if statement

10. Debug the following code:

[DEBUG CODE](#)

Code to Debug:

```
1 def on_forever():
2     if input.button_is_pressed(Button.A):
3         basic.show_icon(IconNames.HAPPY)
4     elif input.button_is_pressed(Button.B):
5         basic.show_icon(IconNames.HEART)
6     else
7         basic.show_icon(IconNames.GIRAFFE)
8 basic.forever(on_forever)
```

Robotics Challenges (5)

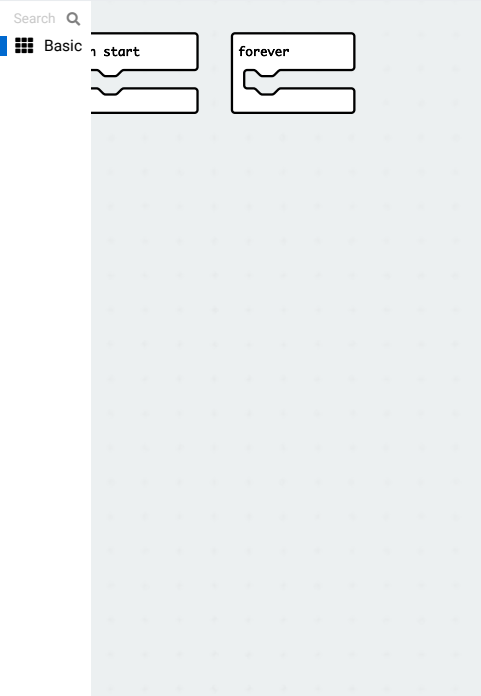
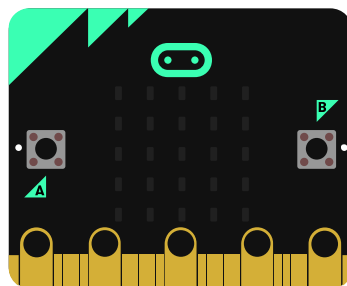
1. Name Tag

Name Tag

Create a program that will display your first name if you press the A button and your last name if you press the B button. If neither of these buttons are pressed it will display a **HAPPY** icon.

Requirements

- Create the forever function
- Inside the forever function, add the if statement to see if the A button is pressed
- If the Button A is pressed, show the first name as a string.
- Add the elif statement to see if the button B is pressed
- If the button B is pressed, show the last

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2. Check Yes or No

Challenge

Textbook

Check Yes or No

Create a program where the micro:bit will show a YES icon if the button A is pressed.
Elif the button B is pressed, a NO icon will show.
Else, the SMALL_SQUARE will show.

Requirements

Create the forever function

Inside the forever function, add the if statement to see if the A button was pressed.

If the Button A is pressed, show the YES icon.

Inside the forever function, add the elif statement to see if the B button was pressed.

Basic

start

forever

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3. Button A or Button B

Challenge

Textbook

Button A or Button B

Create a program that will display the letter A if Button A is pressed. It will show the letter B if Button B is pressed. If neither buttons are pressed, the UMBRELLA icon will appear.

Requirements

Create the forever function

Inside the forever function, add the if statement to see if the A button was pressed

If the Button A is pressed, show the letter A as a string.

Add the elif statement to see if the button B is pressed

If the button B is pressed, show the

1

def on_forever():

2

pass

3

basic.forever(on_forever)

4

Download

4. Jumping and Moving

Challenge

Textbook

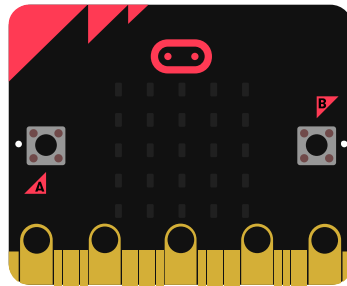
Jumping and Moving

Create a program where a shape will "jump" or move when buttons A or B are pressed.

1. Create a simple shape like a square.
2. If button A is pressed, the shape will "jump"
3. If button B is pressed, the shape should "move" left or right.
4. If neither button is pressed, the shape will stay in the same place.

Requirements

- ☐ Create the forever function
- ☐ Create a simple shape.
- ☐ Add the If statement to see if the button A is pressed



Search

Basic

start

forever

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5. Horse Movement

Challenge

Textbook

Horse Movement

Create an image of a horse. If the button A is pressed, the horse will rear on its back legs. If the button B is pressed, the horse will lay down. If neither button is pressed, it will stand still.

Requirements

- ☐ Create the forever function
- ☐ Create a shape of a horse.
- ☐ Add the If statement to see if the button A is pressed.
- ☐ If the Button A is pressed, show the horse rearing on its back legs
- ☐ Add the elif statement to see if the button B is pressed

Step 1

Create the forever function.

Horse Movement Step 1 of 5

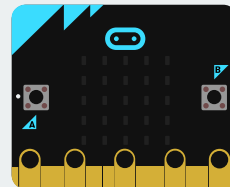
1

Next

Toolbox

Search

```
1 def on_forever():
2     pass
3     basic.forever(on_forever)
4
```



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Answer Keys & Solutions

Questions

1. What will happen when you run this code and press button A?

MULTIPLE CHOICE

Correct Answer:

- A. The HEART icon shows ✗ Incorrect
- B. The GIRAFFE icon shows ✗ Incorrect
- C. The HAPPY icon shows ✓ Correct
- D. No icon shows ✗ Incorrect

Explanation:

The if statement checks button A first and runs when it finds a match.

2. What icon will show when you run this code without pressing any buttons?

MULTIPLE CHOICE

Correct Answer:

- A. HAPPY icon ✗ Incorrect
- B. HEART icon ✗ Incorrect
- C. GIRAFFE icon ✓ Correct
- D. No icon shows ✗ Incorrect

Explanation:

The else statement runs when no other conditions are true.

3. A student writes this code but forgets proper indentation. What will happen?

MULTIPLE CHOICE

Correct Answer:

A. The code works perfectly

✗ Incorrect

B. Only the GIRAFFE icon shows

✗ Incorrect

C. The code will have an error

✓ Correct

D. Only the HAPPY icon shows

✗ Incorrect

Explanation:

Python needs proper indentation to know which code belongs to each condition.

4. You want the GHOST icon to show only when either button A or button B are pressed. How would you write this condition?

MULTIPLE CHOICE

Correct Answer:

A. if input.button_is_pressed(Button.A) or input.button_is_pressed(Button.B):

✓ Correct

B. if input.button_is_pressed(Button.A) and input.button_is_pressed(Button.B):

✗ Incorrect

C. elif input.button_is_pressed(Button.A) + input.button_is_pressed(Button.B):

✗ Incorrect

D. else input.button_is_pressed(Button.A) input.button_is_pressed(Button.B):

✗ Incorrect

Explanation:

Use OR when you want either condition to work.

5. What is wrong with this code structure?

MULTIPLE CHOICE

Correct Answer:

A. The indentation is wrong

✗ Incorrect

B. The elif comes after the else statement

✓ Correct

C. Missing button check

✗ Incorrect

D. Wrong icon names

✗ Incorrect

Explanation:

All elif statements must come before the else statement in the sequence.

6. A student wants the SKULL icon to show when button A is pressed, but wants nothing to happen for other buttons. What code structure should they use?

MULTIPLE CHOICE

Correct Answer:

A. if, elif, else

✗ Incorrect

B. if, else

✗ Incorrect

C. if

✓ Correct

D. elif, else

✗ Incorrect

Explanation:

When you want something specific to happen and nothing else, use just an if statement.

7. In this code, what happens when you press and quickly release button A?

MULTIPLE CHOICE

Correct Answer:

A. HAPPY icon stays on screen

✗ Incorrect

B. GIRAFFE icon shows after you release the button

✓ Correct

C. HEART icon shows

✗ Incorrect

D. Screen goes blank

✗ Incorrect

Explanation:

The forever loop keeps checking conditions, so when you let go, the else condition runs.

8. You want to create a simple menu system where button A shows "Option 1", button B shows "Option 2", and no buttons show "Select Option". Which statement type do you need?

MULTIPLE CHOICE

Correct Answer:

A. Only if statements

✗ Incorrect

B. Only else statements

✗ Incorrect

C. if, elif, and else statements

✓ Correct

D. Only elif statements

✗ Incorrect

Explanation:

You need all three types to handle multiple specific choices plus a default option.

9. What does "elif" stand for and when do you use it?

MULTIPLE CHOICE

Correct Answer:

A. Else if - use it for the last condition in your code

✗ Incorrect

B. Else if - use it to add more conditions after the first if statement

✓ Correct

C. End if - use it to close an if statement

✗ Incorrect

D. Extra if - use it instead of an if statement

✗ Incorrect

Explanation:

Think of elif as a way to check additional specific conditions in order.

10. Debug the following code:

DEBUG CODE

Incorrect Code:

```
1 def on_forever():
2     if input.button_is_pressed(Button.A):
3         basic.show_icon(IconNames.HAPPY)
4     elif input.button_is_pressed(Button.B):
5         basic.show_icon(IconNames.HEART)
6     else
7         basic.show_icon(IconNames.GIRAFFE)
8 basic.forever(on_forever)
```

Correct Solution:

```
1 def on_forever():
2     if input.button_is_pressed(Button.A):
3         basic.show_icon(IconNames.HAPPY)
4     elif input.button_is_pressed(Button.B):
5         basic.show_icon(IconNames.HEART)
6     else:
7         basic.show_icon(IconNames.GIRAFFE)
```

```
8 basic.forever(on_forever)
```

Explanation:

This code is missing a semicolon