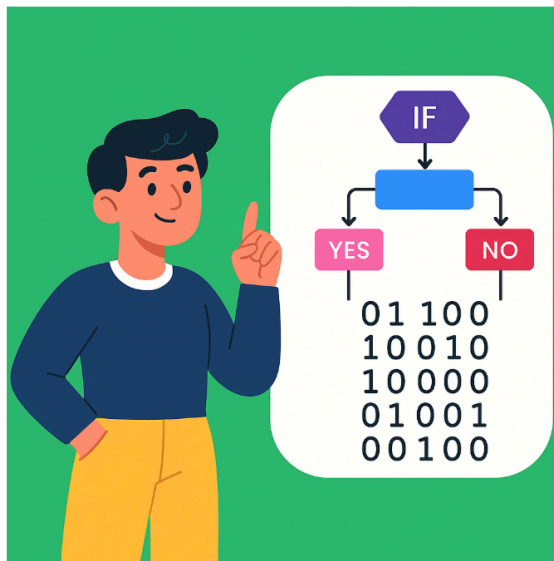


Conditional Logic

Textbook

Conditional Logic



"Jordan's Smart Robot Helper"

Jordan was building a robot helper in computer class. "I want my robot to be smart," Jordan told the teacher. "If someone says they're cold, then the robot should turn on the heater. If they say they're hungry, then it should remind them about snack time."

The teacher smiled. "That's called conditional logic! You're telling the robot to make decisions based on different situations."

Jordan was curious. "So the robot can think about 'if this happens, then do that'?"

"Exactly!" said the teacher. "That's how we make computers and robots smart enough to solve problems."

Think About It!

1. Can you think of times when you make "if-then" decisions in real life?
2. How might conditional logic help a computer program?

What is Conditional Logic?

Conditional logic is when we tell a computer to make different choices based on what happens. We use "if-then" statements to give the computer instructions.

Examples in real life:

- If it's raining, then take an umbrella
- If you're hungry, then eat a snack
- If the light is red, then stop
- If someone says hello, then say hello back

In coding, we use the same idea:

- If the sprite is touched, then make it jump
- If the sprite reaches the edge, then turn around
- If a key is pressed, then move the character

If-Then Blocks in Our Coding

In our block coding platform, we can use conditional logic with special blocks:

Event Blocks with Conditions:

- **"On Tap Event"** = If the sprite is tapped, then do the following actions
- **"On Touch Event"** = If the sprite touches another sprite, then do the following actions
- **"On Message Event"** = If a message is received, then do the following actions

How it works:

1. The computer watches for the "if" condition
2. When that condition happens, it does the "then" actions
3. If the condition doesn't happen, it waits or does something else

Simple If-Then Coding Examples

Example 1: Tap Response

IF sprite is tapped THEN sprite says "Hello!" THEN sprite hops

Example 2: Collision Response

IF sprite touches the ball THEN sprite shrinks THEN play "pop" sound

Example 3: Message Response

IF red message is received THEN sprite moves right THEN sprite grows

While Loops – Advanced Conditional Logic

A while loop means "keep doing something while a condition is true."

Examples:

- While the sprite is moving, play music

- While the game is running, keep checking for touches
- While the sprite is big, make it flash

In our coding: The "Repeat Forever" block is like a while loop - it keeps repeating the actions while the program is running.

Building Conditional Logic Skills

Step 1: Identify the Condition What needs to happen first? (the "if" part)

- Sprite is tapped?
- Sprite touches something?
- A message is sent?

Step 2: Plan the Response What should happen next? (the "then" part)

- Move the sprite?
- Change how it looks?
- Play a sound?
- Send a message to another sprite?

Step 3: Code It Use the right event block and add the response actions underneath.

Conditional Logic Coding Activity

Let's practice creating if-then logic with our sprites!

Activity: Smart Pet Create a pet sprite that responds differently based on what happens:

Requirements:

1. If the pet is tapped then it says "Woof!" and wags (rotates)
2. If the pet touches a food sprite then it grows bigger and says "Yum!"
3. If the pet receives a "sleep" message then it hides and plays a quiet sound

Blocks you'll use:

- On Tap Event block
- On Touch Event block
- On Message Event block
- Speech bubble blocks
- Motion blocks (rotate)
- Looks blocks (grow, hide)

- Sound blocks

Real-World Connections

Conditional logic is everywhere around us:

In Technology:

- Smart lights that turn on when it gets dark
- Cars that beep if you don't wear a seatbelt
- Video games that show "Game Over" if you lose all lives
- Automatic doors that open when someone approaches

In Everyday Life:

- Traffic lights that change based on traffic
- Thermostats that turn on heat when it's cold
- Fire alarms that sound when they detect smoke

Critical Thinking Questions

1. What is conditional logic and how do we use it in coding?
2. Can you think of an "if-then" situation from your daily life?
3. How do while loops help us create more interactive programs?

Sentence Stems

Here are some sentence starters to help us talk about conditional logic:

- **"If (blank) happens, then my sprite will (blank)."**
- **"Conditional logic means (blank)."**
- **"I can use an event block to make my sprite (blank) when (blank)."**