Scratch Programming: 4. Xylophone

Task: Create a xylophone

Lesson Objectives:

To illustrate the logic needed to compete a task in an efficient manner. This logic can then be applied when designing programs.

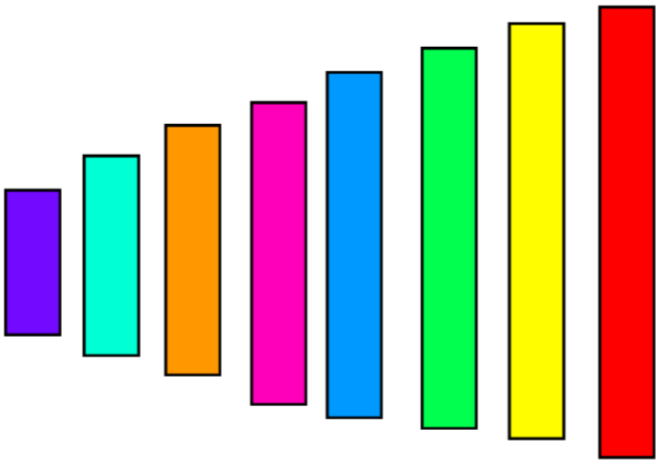
What do you need to do?

In this exercise you are expected t be able to complete the task by yourself without set-by-step instructions. This is crucial to the learning process. Even if you are unable to complete the task initially, the process of figuring out what you need to do, and how, is the purpose of the lesson – using logic!

Always remember to save your work (Save as) in a place you can remember and test your program. Regular saving of your programs will help you if you make mistakes or if there is problem and you lose your work.

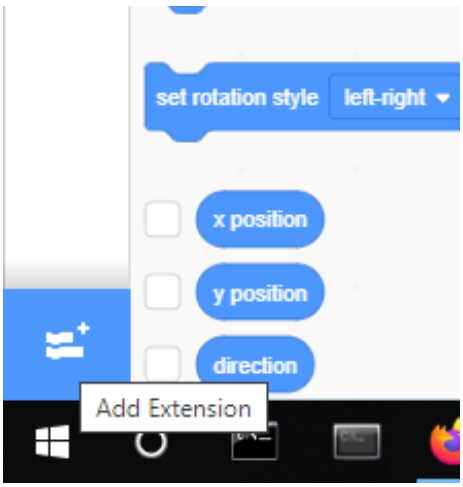
Instructions

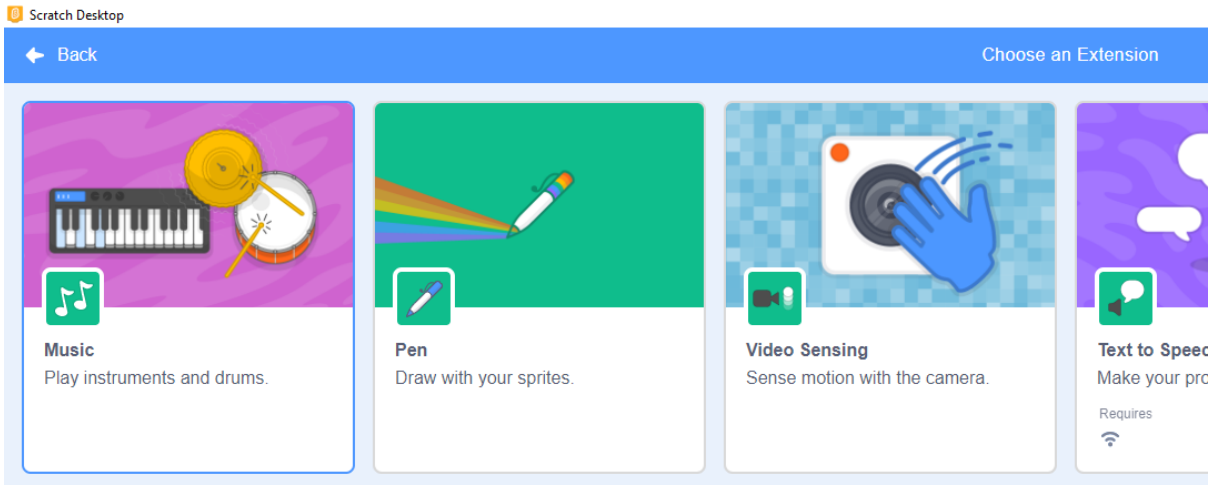
We are creating a xylophone that consists of 8 rectangles of different colors.



To play music we need to add an extension to play notes

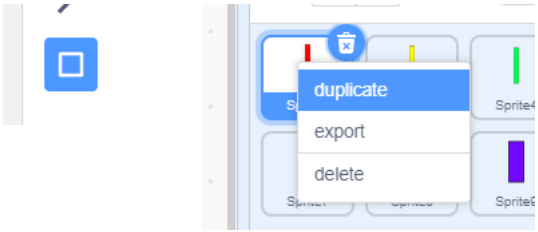
- Each rectangle plays a different note
- Add extension
- Add music

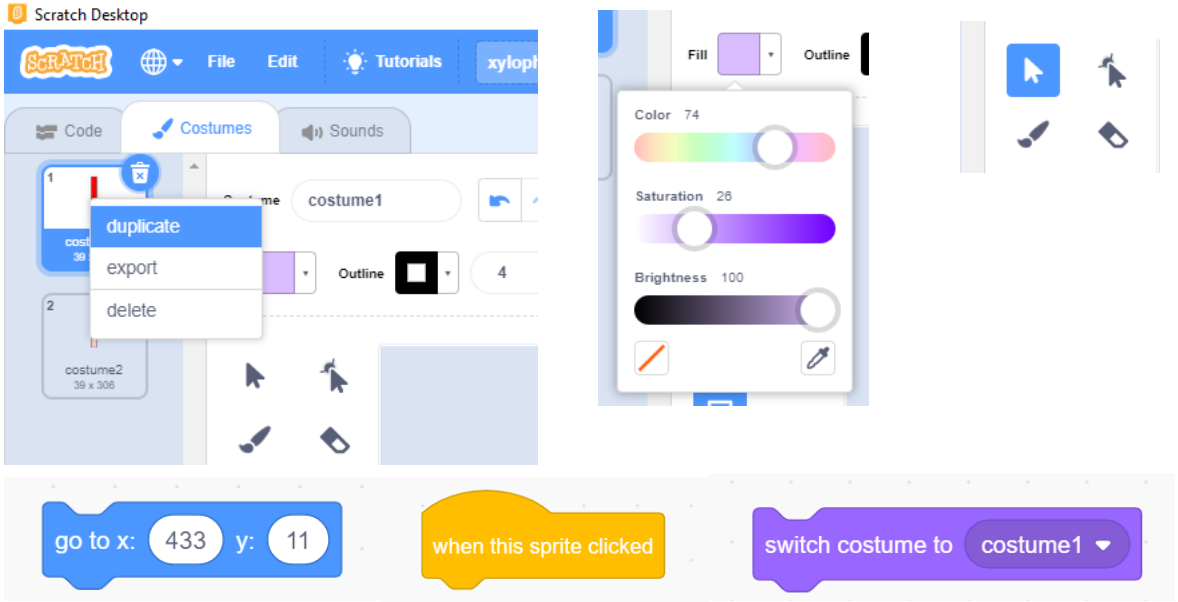




What do you need to do?

- How to draw a rectangle
- How to duplicate a rectangle
- How to change the color of a rectangle
- How to change the shape of a rectangle
- How to move / set location of a rectangle
- When this sprite clicked
- Switch costume





Logic- order matters!

Logic example #1

- Build a xylophone
- But there are quicker or slower ways of doing the same thing
- Write exactly how you are going to achieve your goal
    - Write instruction 1
    - Write instruction 2
    - Write instruction 3
    - etc

1. Draw a rectangle
2. Resize rectangle
3. Change rectangle color
4. Draw a rectangle (costume 2)
5. Resize rectangle (costume 2)
6. Change rectangle color saturation (costume 2)
7. Add when flag clicked
8. Calculate position of rectangle
9. Set go to x, y
10. Add switch to costume 1
11. Add when this sprite clicked
12. Add switch to costume 2
13. Add play note block
14. Change to note
15. Add switch to costume 1

Repeat for 8 rectangles (15*8 = 120 instructions)

Do you wish to write out all 120 instructions?
How could you do this easier & quicker?
Hint: you have access to these slides

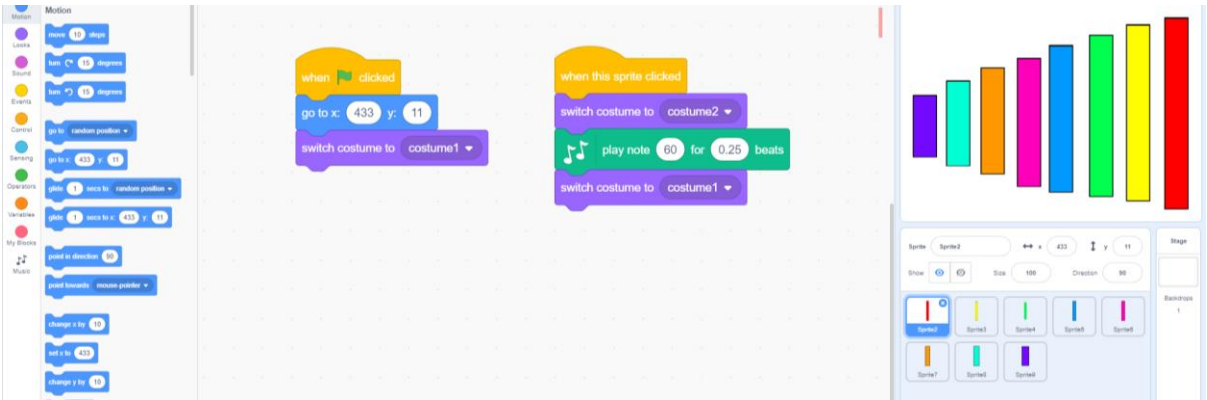
Can you use this approach to make the instructions set less?
Can you use this to make completing the task easier & quicker?
What is the best, easiest & quickest way to complete the task?

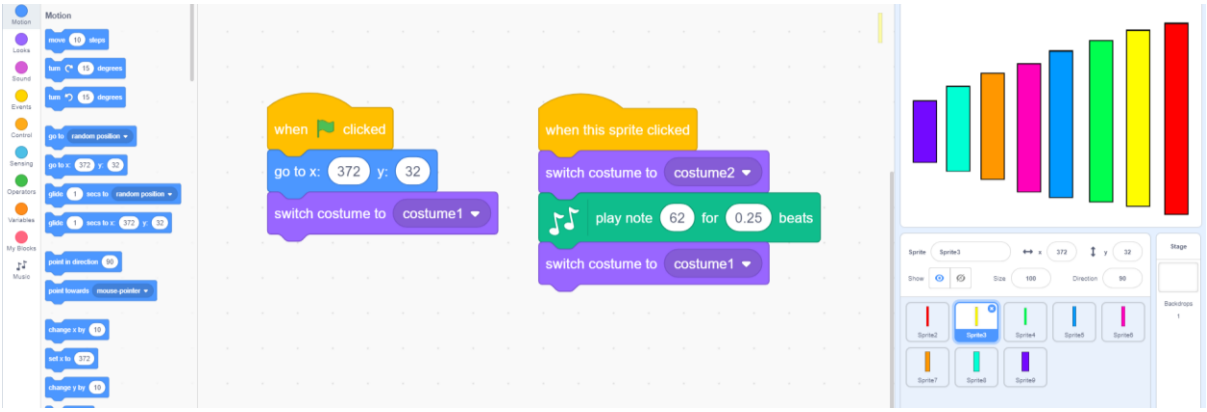
This logic is used in programming design

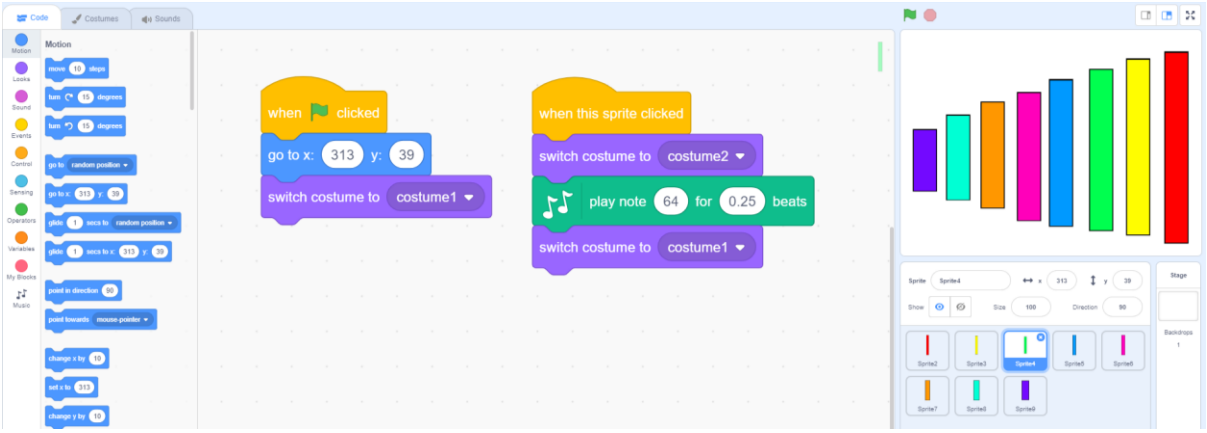
Programming concept – a loop
Number = 1
Loop (10)
  Print number
  Add 1 to number

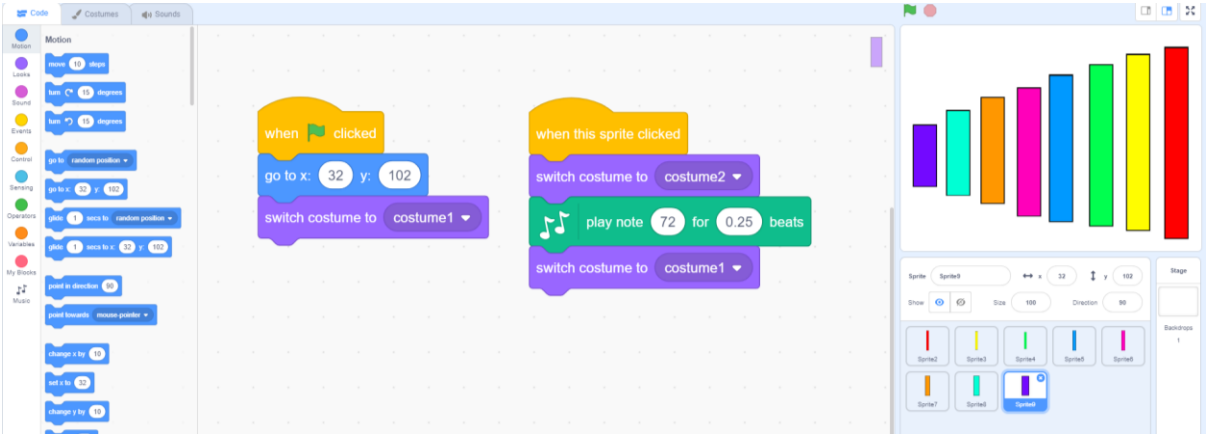
So can you work out the ***best*** way to complete the task – not the easiest? Below are some of the blocks from the rectangles that form the xylophone. These alone teach us very little. But how efficient you can complete the task shows your ability to use logic.

Logic will make your programs either work or work better. You can illustrate your approach in a flow chart.









Well done you have completed Task 4