THE STRIVING

MUSLIM ACADEMY

Islamic and Academic Education

YEARS 7 TO 9 · COMPUTING

Programming and Boolean logic

The same program in two languages, one of them textual, and AND, OR and NOT in both code and circuits.

WHAT IS INSIDE

- Running a program by hand, in two languages
- Boolean logic, in programs and in circuits
- How each one is worked

The Striving Muslim Academy

2 sets · a hint on every question

Written for a parent teaching at home. No training assumed, and nothing else to buy.

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Running a program by hand, in two languages, continued

6. **Where does the robot finish, and which way is it facing?**



```
REPEAT 4 [
    FORWARD 5
    RIGHT
]
```

Four forwards with a right turn after each one. Think about the shape that makes.

7. **Both programs opposite do the same thing in two languages. Name two things the textual version has to say that the block version does not.**

The school's own language

```
SET score TO 0
REPEAT 4 [
    FORWARD 3
    ADD 5 TO score
    RIGHT
]
```

The same thing, written as text

```
score = 0
for i in range(4):
    forward(3)
    score = score + 5
    right()
```

Look at what punctuation and indentation are doing in the text.

Boolean logic, in programs and in circuits

Work it out on paper before checking the back.



1. Complete the truth table for A AND B and A OR B.

A	B	A AND B	A OR B
0	0		
0	1		
1	0		
1	1		

AND is true only when both are true. OR is true when either is.

2. If A is 1 and B is 1, what is NOT (A AND B)?

Work out the bracket first, then flip it.

3. If A is 1 and B is 1, what is NOT (A AND B)?

Work out the bracket first, then flip it.

4. If A is 0 and B is 1, what is NOT (A AND B)?

Work out the bracket first, then flip it.

5. If A is 1 and B is 1, what is NOT (A OR B)?

Work out the bracket first, then flip it.

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How each one is worked, continued

RUNNING A PROGRAM BY HAND, IN TWO LANGUAGES, CONTINUED



7. Both programs opposite do the same thing in two languages. Name two things the textual version has to say that the block version does not.

1. The textual version needs a colon to open the loop body and indentation to show what is inside it, where the block version uses brackets.
2. It also needs a loop variable, i, even though nothing uses it.
3. Both are ways of marking where a block begins and ends, which every language has to do somehow.

Answer: **a colon and indentation instead of brackets, and a loop variable that nothing uses**

BOOLEAN LOGIC, IN PROGRAMS AND IN CIRCUITS

1. Complete the truth table for A AND B and A OR B.

1. AND gives 1 only on the last row, where both are 1.
2. OR gives 1 on every row except the first.
3. The column for AND is 0, 0, 0, 1 and for OR is 0, 1, 1, 1.

Answer: **AND: 0, 0, 0, 1 and OR: 0, 1, 1, 1**

2. If A is 1 and B is 1, what is NOT (A AND B)?

1. A AND B is 1.
2. NOT flips it, so the answer is 0.

Answer: **0**

3. If A is 1 and B is 1, what is NOT (A AND B)?

1. A AND B is 1.
2. NOT flips it, so the answer is 0.

Answer: **0**

4. If A is 0 and B is 1, what is NOT (A AND B)?

1. A AND B is 0.
2. NOT flips it, so the answer is 1.

Answer: **1**

5. If A is 1 and B is 1, what is NOT (A OR B)?

1. A OR B is 1.
2. NOT flips it, so the answer is 0.

Answer: **0**

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SAMPLE PAGES

You have read a few pages. The pack is longer.

What you are holding is a short sample, taken from different parts of the pack so that you can see how a week is planned and what a child is actually asked to do, before you decide.

The complete pack, and the rest of the academic materials, are on our website: schemes of work for a parent teaching at home, and practice packs for the skills children get stuck on.

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Islamic and Academic Education

Members of the homeschool community do not buy these. If you have joined the community, the pack for the term you are working on is given to you at no cost.

Our Islamic Education classes are free. These packs are part of what pays the teachers who teach them.