National 5 Computing Homework

Computational Thinking

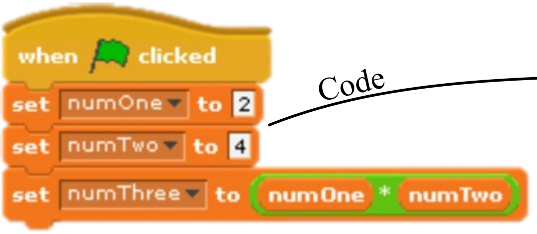
Topic 2 - Values & Variables

Name -

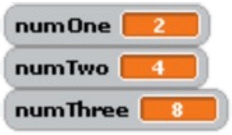
Grade - / 37

Feedback

The Scratch program below uses three variables called “numOne”, “numTwo” and “numThree” to store values. As the program runs the values stored in each variable will change. The program code and the output it generates is shown below.



```
when [flag] clicked
set numOne to 2
set numTwo to 4
set numThree to (numOne * numTwo)
```

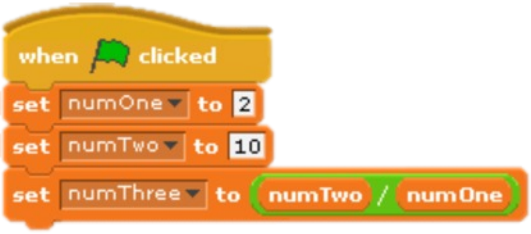


```
numOne 2
numTwo 4
numThree 8
```

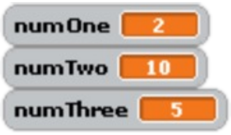
Note the numThree ends up with the value 8.
The last line of code sets:
numThree = numOne * numTwo (or 2*4).

For each of the following problems, think through the code and write down the value of each variable at the end of the program. The problems will get harder and harder.

1. State the value of each variable once the program has been run. **(3)**

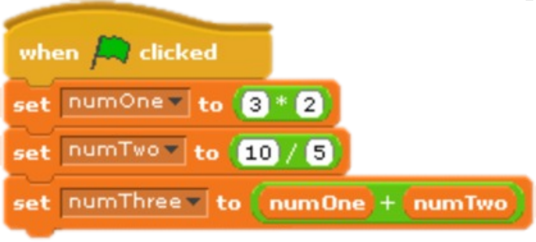


```
when [flag] clicked
set numOne to 2
set numTwo to 10
set numThree to (numTwo / numOne)
```

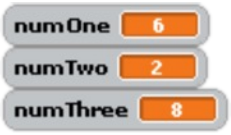


```
numOne 2
numTwo 10
numThree 5
```

2. State the value of each variable once the program has been run. **(3)**

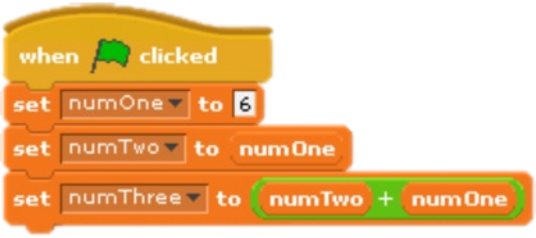


```
when [flag] clicked
set numOne to (3 * 2)
set numTwo to (10 / 5)
set numThree to (numOne + numTwo)
```

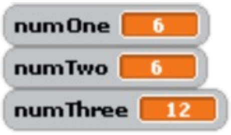


```
numOne 6
numTwo 2
numThree 8
```

3. State the value of each variable once the program has been run. **(3)**

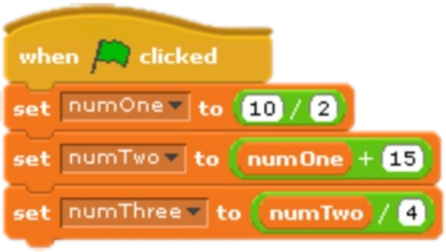


```
when [flag] clicked
set numOne to 6
set numTwo to numOne
set numThree to (numTwo + numOne)
```

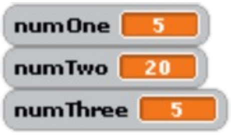


```
numOne 6
numTwo 6
numThree 12
```

4. State the value of each variable once the program has been run. **(3)**



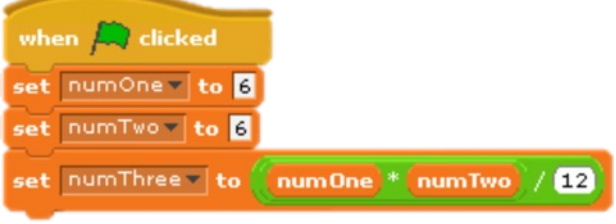
```
when [flag] clicked
set numOne to (10 / 2)
set numTwo to (numOne + 15)
set numThree to (numTwo / 4)
```



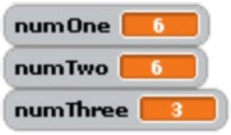
```
numOne 5
numTwo 20
numThree 5
```

Created by Mr G Reid, PTC Technologies, Buckhaven High School, October 2013

5. State the value of each variable once the program has been run. **(3)**

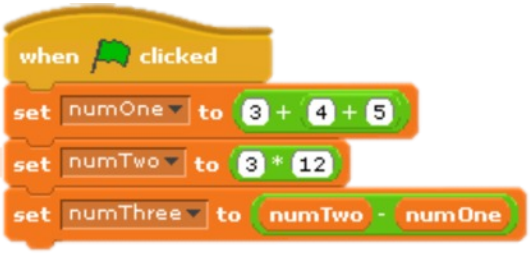


```
when ⚑ clicked
set numOne to 6
set numTwo to 6
set numThree to ((numOne * numTwo) / 12)
```

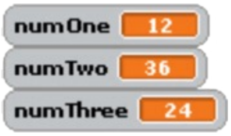


numOne 6
numTwo 6
numThree 3

6. State the value of each variable once the program has been run. **(3)**

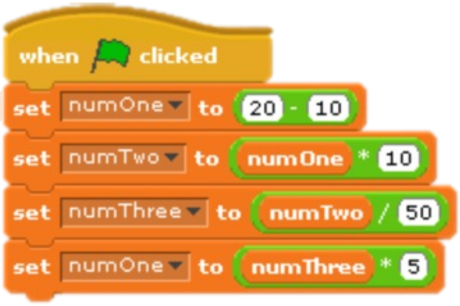


```
when ⚑ clicked
set numOne to (3 + (4 + 5))
set numTwo to (3 * 12)
set numThree to (numTwo - numOne)
```

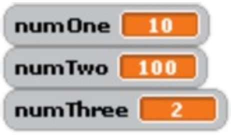


numOne 12
numTwo 36
numThree 24

7. State the value of each variable once the program has been run. **(3)**

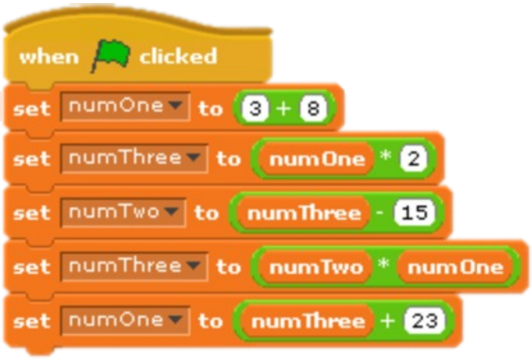


```
when ⚑ clicked
set numOne to (20 - 10)
set numTwo to (numOne * 10)
set numThree to (numTwo / 50)
set numOne to (numThree * 5)
```

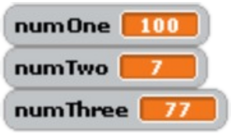


numOne 10
numTwo 100
numThree 2

8. State the value of each variable once the program has been run. **(3)**

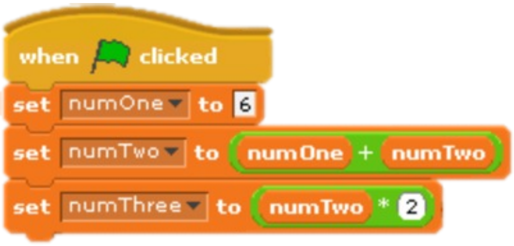


```
when ⚑ clicked
set numOne to (3 + 8)
set numThree to (numOne * 2)
set numTwo to (numThree - 15)
set numThree to (numTwo * numOne)
set numOne to (numThree + 23)
```

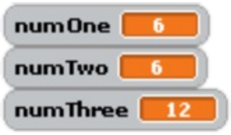


numOne 100
numTwo 7
numThree 77

9. If a variable has not been given a value before it is automatically set to 0.
State the value of each variable once the program has been run. **(3)**

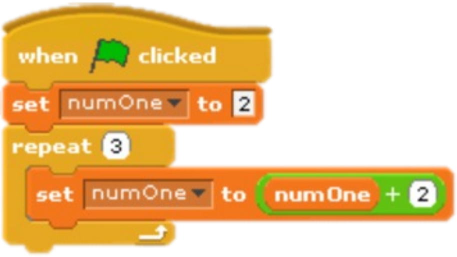


```
when ⚑ clicked
set numOne to 6
set numTwo to (numOne + numTwo)
set numThree to (numTwo * 2)
```

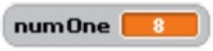


numOne 6
numTwo 6
numThree 12

10. Remember that a loop will cause parts of your program code to repeat.
State the value of each variable once the program has been run. **(1)**

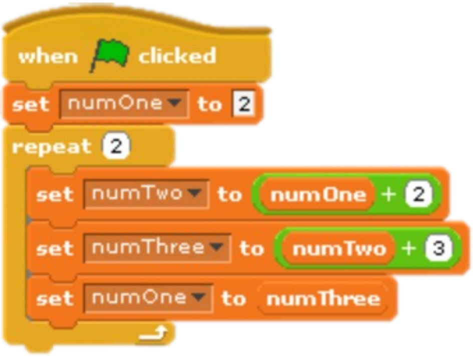


```
when [flag] clicked
set numOne to 2
repeat 3
    set numOne to (numOne + 2)
```

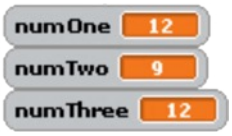


numOne 8

11. State the value of each variable once the program has been run. **(3)**

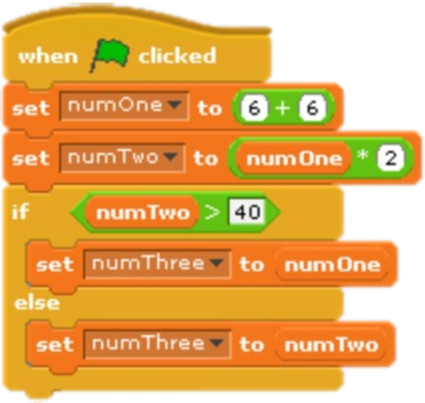


```
when [flag] clicked
set numOne to 2
repeat 2
    set numTwo to (numOne + 2)
    set numThree to (numTwo + 3)
    set numOne to numThree
```

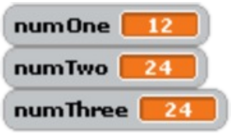


numOne 12
numTwo 9
numThree 12

12. An IF statement makes a decision about which code is executed next.
State the value of each variable once the program has been run. **(3)**

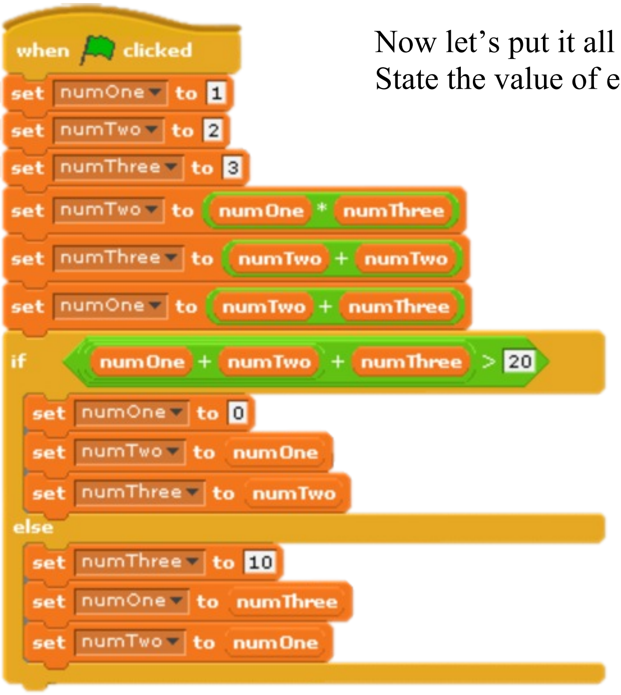


```
when [flag] clicked
set numOne to (6 + 6)
set numTwo to (numOne * 2)
if <numTwo > 40>
    set numThree to numOne
else
    set numThree to numTwo
```

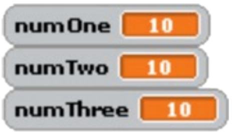


numOne 12
numTwo 24
numThree 24

13. Now let's put it all together. Good luck with this one.
State the value of each variable once the program has been run. **(3)**



```
when [flag] clicked
set numOne to 1
set numTwo to 2
set numThree to 3
set numTwo to (numOne * numThree)
set numThree to (numTwo + numTwo)
set numOne to (numTwo + numThree)
if <((numOne + numTwo) + numThree) > 20>
    set numOne to 0
    set numTwo to numOne
    set numThree to numTwo
else
    set numThree to 10
    set numOne to numThree
    set numTwo to numOne
```



numOne 10
numTwo 10
numThree 10