Pre- and post-test used in PyratesIA study

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This document contains the pre- and post-tests used in the experiment to evaluate the automatic feedback system integrated into the Pyrates application. In the questions below, the programming concept involved is given into brackets (this was not the case in the test submitted to the students), the number of stars indicates the difficulty of the question (between 1 and 3), and the correct answer is indicated in bold.
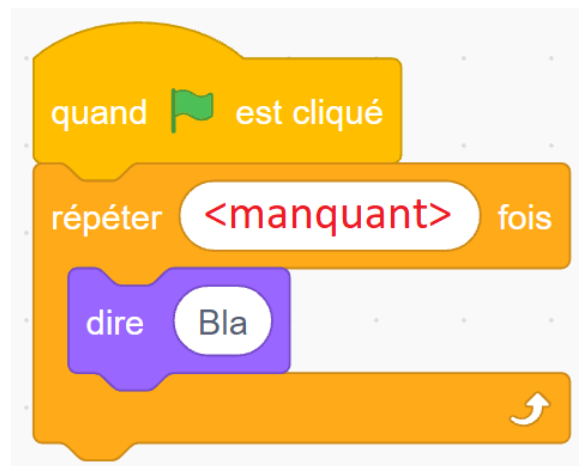
1 Pre-test

Q1 (variable) * - What is the display produced by the program below when executed?

   a) c

   b) 4

   c) 6

   d) **10**

   e) 12

Q2 (Loop for) * - The program below should display 'Bla Bla Bla Bla Bla' when executed:

What value should be given to the missing code? (¡manquant¿)

a) 1

b) 2

c) 3

d) 4

e) **5**

Q3 (conditional) * - What does the program below display when executed?

a) Bonjour Madame

b) Bonjour Monsieur

c) Bonjour Madame Monsieur !

d) Bonjour Madame !

e) **Bonjour Monsieur !**

Q4 (variable) ** - What does the program below display when executed? For your information, the block * is used to perform multiplication.
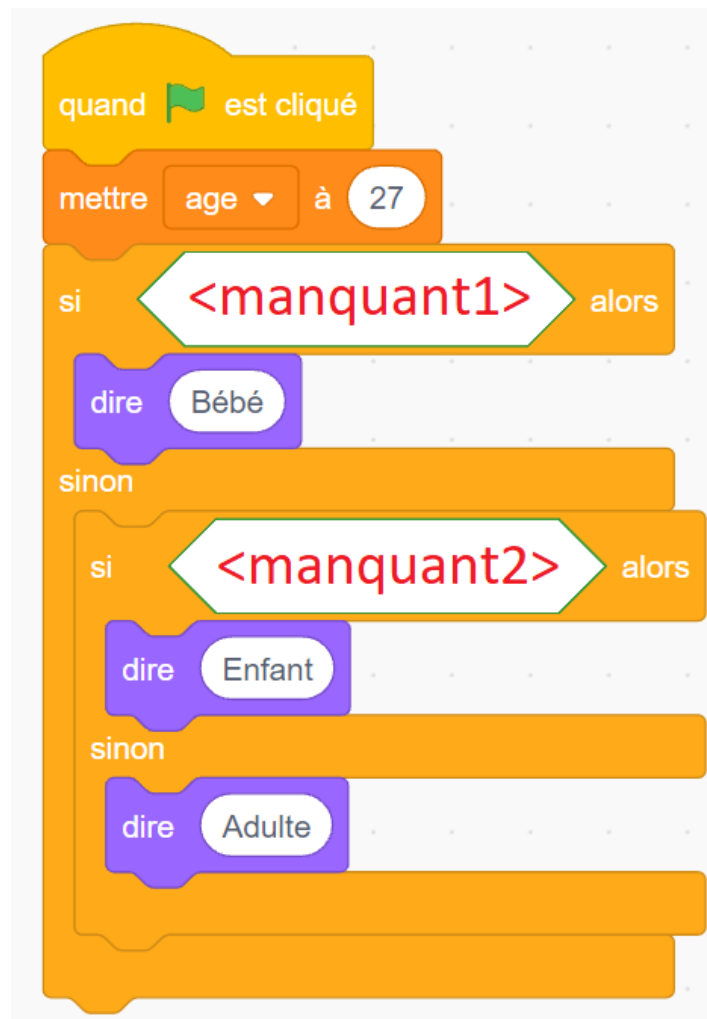

a) c

b) 2

c) 9

d) 12

e) **14**
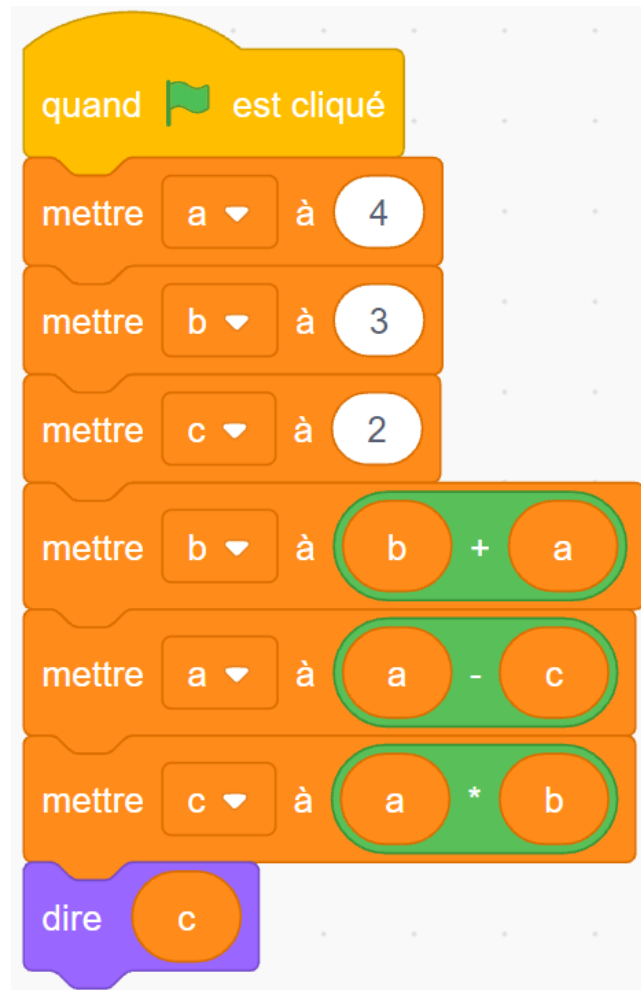
Q5 (for loop) ** - What does the program below display when executed?

a) **Hey Hey Hey !**
   Hey Hey Hey !
   Hey Hey Hey !
   Hey Hey Hey !

b) Hey Hey Hey Hey !
   Hey Hey Hey Hey !
   Hey Hey Hey Hey !

c) Hey ! Hey ! Hey !
   Hey ! Hey ! Hey !
   Hey ! Hey ! Hey !
   Hey ! Hey ! Hey !

d) Hey ! Hey ! Hey ! Hey !
   Hey ! Hey ! Hey ! Hey !
   Hey ! Hey ! Hey ! Hey !

e) Hey Hey Hey
   Hey Hey Hey
   Hey Hey Hey
   Hey Hey Hey !

Q6 (conditional)** - The program below should display "Adult" when executed:

What is the missing code? (`<manquant1>` and `<manquant2>`)

a) `<manquant1>`: (age < 3)   `<manquant2>` : (age < 18)   **Correct answer**

b) `<manquant1>` : (age > 3)   `<manquant2>` : (age > 18)

c) `<manquant1>` : (age < 3)   `<manquant2>` : (age > 18)

d) `<manquant1>` : (age > 3)   `<manquant2>` : (age < 18)

e) `<manquant1>` : (age > 27)   `<manquant2>` : (age > 27)

Q7 (variable) *** - The program below must calculate the perimeter of a circle using the following formula: $P = 2 \times \pi \times R$ where $\pi \approx 3.14$ and R is the radius of the circle.
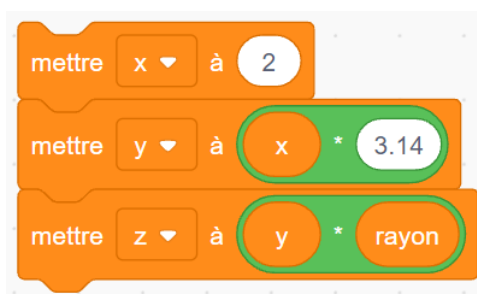
```scratch
quand [drapeau] est cliqué
mettre [rayon ▾] à (5)
<manquant>
<manquant>
<manquant>
dire (z)
```

What is the missing code? (`<manquant>`)

a)
```scratch
mettre [x ▾] à (3.14)
mettre [y ▾] à (rayon * rayon)
mettre [z ▾] à (x * y)
```
Correct answer

b)
```scratch
mettre [x ▾] à (2)
mettre [y ▾] à (x * 3.14)
mettre [z ▾] à (y * rayon)
```

c)
```scratch
mettre [x ▾] à (2)
mettre [y ▾] à (rayon)
mettre [z ▾] à (y * y)
```
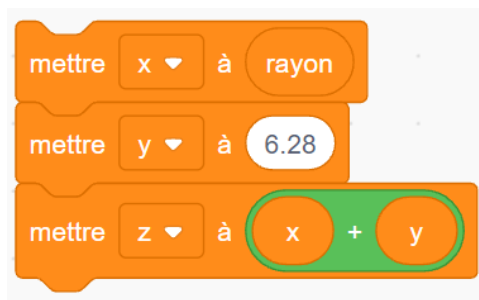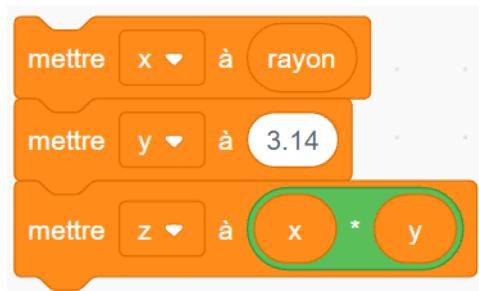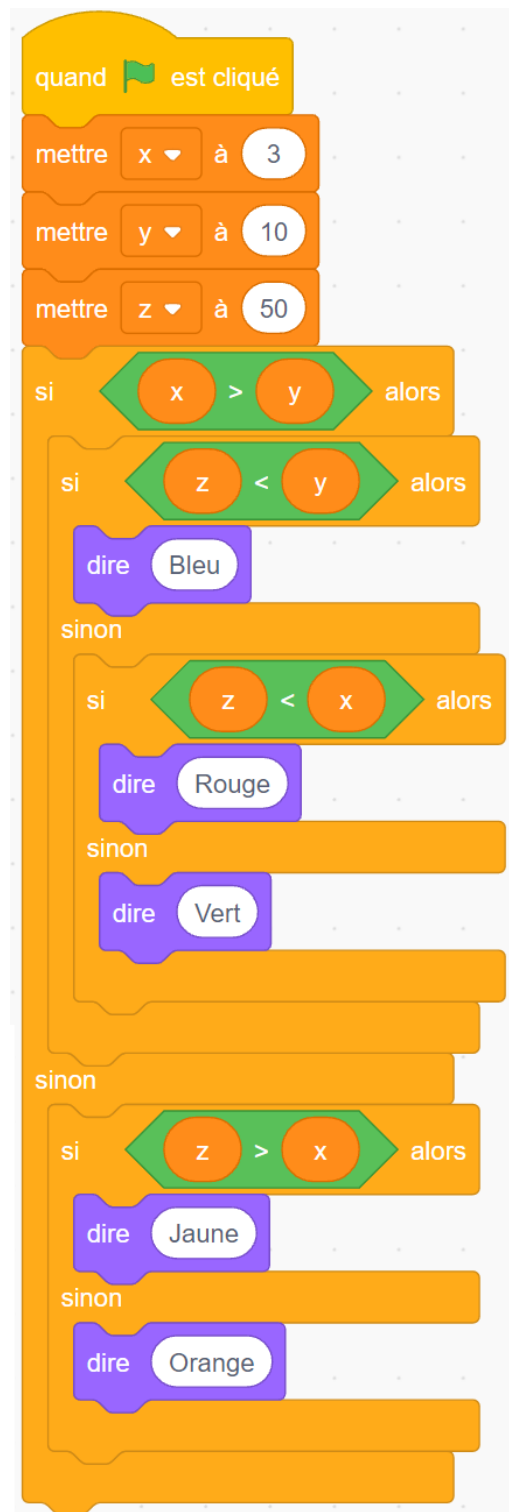
d)

e)

Q8 (for loop) *** - What does the program below display when executed?

a) It displays 15 times the word "counter"

b) It displays 3 times the numbers from 1 to 5

c) It displays 3 times the numbers from 1 to 6

d) **It displays 3 times the numbers from 0 to 4**

e) It displays 3 times the numbers from 0 to 5

Q9 (conditional) *** - What does the program below display when executed?

```
quand [drapeau] est cliqué
mettre x à 3
mettre y à 10
mettre z à 50
si < x > y > alors
    si < z < y > alors
        dire Bleu
    sinon
        si < z < x > alors
            dire Rouge
        sinon
            dire Vert
sinon
    si < z > x > alors
        dire Jaune
    sinon
        dire Orange
```

a) Bleu

b) Rouge

c) Vert

d) **Jaune**

e) Orange

2 Post-test

Q1 (variable) * - What is the display produced by the program below when executed?

```
1 a = 4
2 b = 6
3 c = a + b
4 dire(c)
```

a) c

b) 4

c) 6

d) **10**

e) 12

Q2 (Loop for) * - The program below should display 'Bla Bla Bla Bla Bla' when executed:

```
1  for _ in range(# code manquant):
2      dire("Bla")
```

What value should be given to the missing code? (¡manquant¿)

a) 1

b) 2

c) 3

d) 4

e) **5**

Q3 (conditional) * - What does the program below display when executed?

```
1 genre = "H"
2 dire("Bonjour")
3 if genre == "F":
4     dire("Madame")
5 else:
6     dire("Monsieur")
7 dire("!")
```

a) Bonjour Madame

b) Bonjour Monsieur

c) Bonjour Madame Monsieur !

d) Bonjour Madame !

e) **Bonjour Monsieur !**

Q4 (variable) ** - What does the program below display when executed? For your information, the operator * is used to perform multiplication.

```
1 a = 4
2 b = 3
3 c = 2
4 b = b + a
5 a = a - c
6 c = a * b
7 dire(c)
```

a) c

b) 2

c) 9

d) 12

e) **14**

Q5 (for loop) ** - What does the program below display when executed?

```
1  for _ in range(4):
2      for _ in range(3):
3          dire("Hey")
4      dire("!")
```

a) **Hey Hey Hey !**
   Hey Hey Hey !
   Hey Hey Hey !
   Hey Hey Hey !

b) Hey Hey Hey Hey !
   Hey Hey Hey Hey !
   Hey Hey Hey Hey !

c) Hey ! Hey ! Hey !
   Hey ! Hey ! Hey !
   Hey ! Hey ! Hey !
   Hey ! Hey ! Hey !

d) Hey ! Hey ! Hey ! Hey !
   Hey ! Hey ! Hey ! Hey !
   Hey ! Hey ! Hey ! Hey !

e) Hey Hey Hey
   Hey Hey Hey
   Hey Hey Hey
   Hey Hey Hey !

Q6 (conditional)** - The program below should display "Adult" when executed:

```
1  age = 27
2  if # code manquant 1
3      dire("Bébé")
4  elif # code manquant 2
5      dire("Enfant")
6  else
7      dire("Adulte")
```

What is the missing code? (# code manquant 1 and # code manquant 2)

a) **manquant1 :** `age < 3` **manquant2 :** `age < 18`

b) manquant1 : `age > 3` manquant2 : `age > 18`

c) manquant1 : `age < 3` manquant2 : `age > 18`

d) manquant1 : `age > 3` manquant2 : `age < 18`

e) manquant1 : `age > 27` manquant2 : `age > 27`

Q7 (variable) *** - The program below must calculate the perimeter of a circle using the following formula: $P = 2 \times \pi \times R$ where $\pi \approx 3.14$ and R is the radius of the circle.

```
1 rayon = 5
2 # code manquant
3 # code manquant
4 # code manquant
5 dire(z)
```

What is the missing code? (# code manquant)

a)
```
2 x = 3.14
3 y = rayon * rayon
4 z = x * y
```
Correct answer

b)
```
2 x = 2
3 y = x * 3.14
4 z = y * rayon
```

c)
```
2 x = 2
3 y = rayon
4 z = y * y
```

d)
```
2 x = rayon
3 y = 6.28
4 z = x + y
```

e)
```
2 x = rayon
3 y = 3.14
4 z = x * y
```

Q8 (for loop) *** - What does the program below display when executed?

```python
1  for _ in range(3):
2      for compteur in range(5):
3          dire(compteur)
```

a) It displays 15 times the word "counter"

b) It displays 3 times the numbers from 1 to 5

c) It displays 3 times the numbers from 1 to 6

d) **It displays 3 times the numbers from 0 to 4**

e) It displays 3 times the numbers from 0 to 5

Q9 (conditional) *** - What does the program below display when executed?

```
1  x = 3
2  y = 10
3  z = 50
4  if x > y :
5      if z < y :
6          dire("Bleu")
7      elif z < x :
8          dire("Rouge")
9      else :
10         dire("Vert")
11 else:
12     if z > x :
13         dire("Jaune")
14     else :
15         dire("Orange")
```

a) Bleu

b) Rouge

c) Vert

d) **Jaune**

e) Orange

[ONLY FOR EXPERIMENTAL GROUP]

QA (qualitative) Did you find the tutor helps useful for progressing in the game? Rate from "not at all" (0) to "very much" (100) by moving the slider.

QB (qualitative) Would you like to have more helps from tutors in the future? Rate from "not at all" (0) to "very much" (100) by moving the slider.