



Textual programming made easy!

Femke Weissenfeld – FOSDEM 2026

TEXTUAL PROGRAMMING



Python error messages



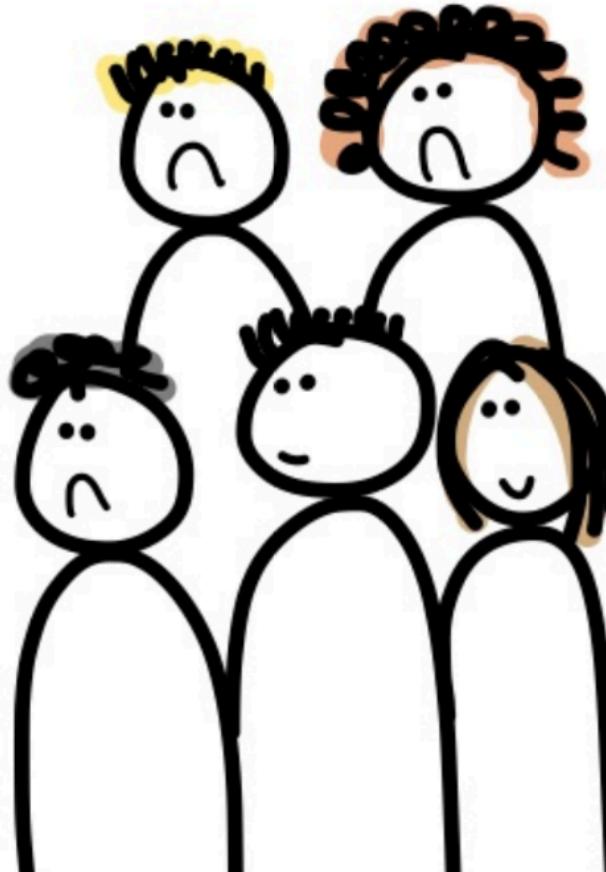
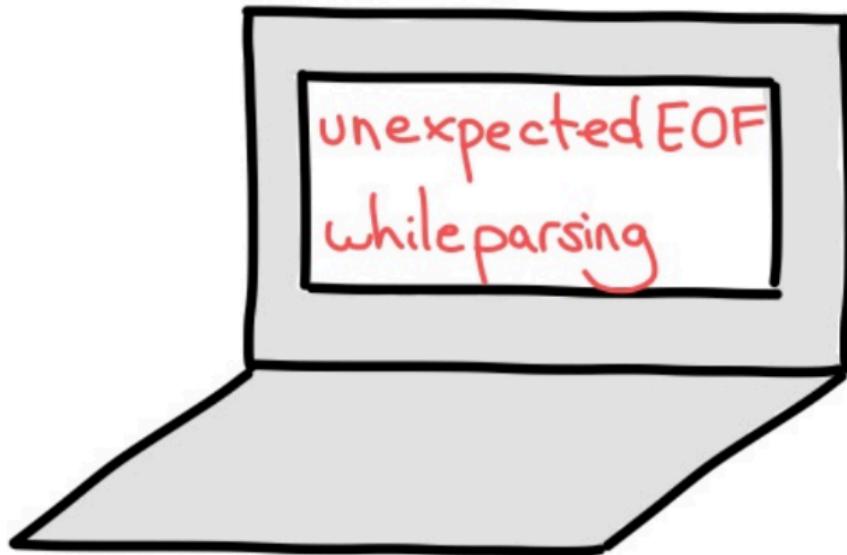
SyntaxError: unterminated string literal (detected at line 1)

IndentationError: unexpected indent

UnboundLocalError: local variable 'x' referenced before assignment

TypeError: 'NoneType' object is not subscriptable

Python error messages



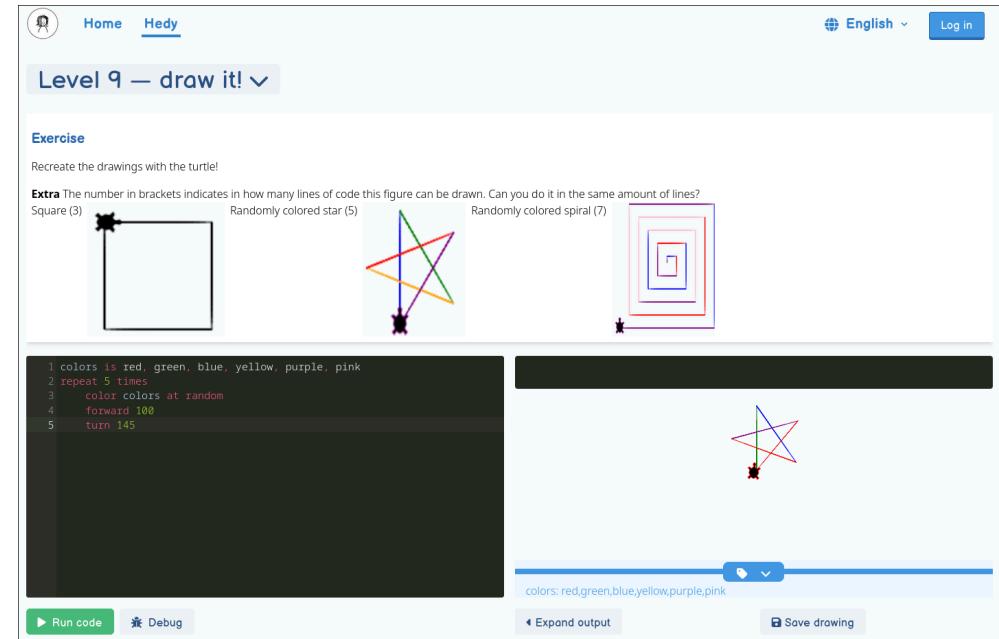
TEXTUAL PROGRAMMING MADE EASY



Meet Hedy!



- ▶ Hedy is a turing complete language
- ▶ Including teacher interface
- ▶ Available in the browser



The screenshot shows the Hedy web-based programming environment. At the top, there are navigation links for 'Home' and 'Hedy', a language selector for 'English', and a 'Log in' button. The main area is titled 'Level 9 — draw it! ▾'. Below the title is an 'Exercise' section with the instruction 'Recreate the drawings with the turtle!'. An 'Extra' note says, 'The number in brackets indicates in how many lines of code this figure can be drawn. Can you do it in the same amount of lines?' with three examples: 'Square (3)', 'Randomly colored star (5)', and 'Randomly colored spiral (7)'. To the left of the examples is a code editor with the following code:

```
1 colors is red, green, blue, yellow, purple, pink
2 repeat 5 times
3   color colors at random
4   forward 100
5   turn 145
```

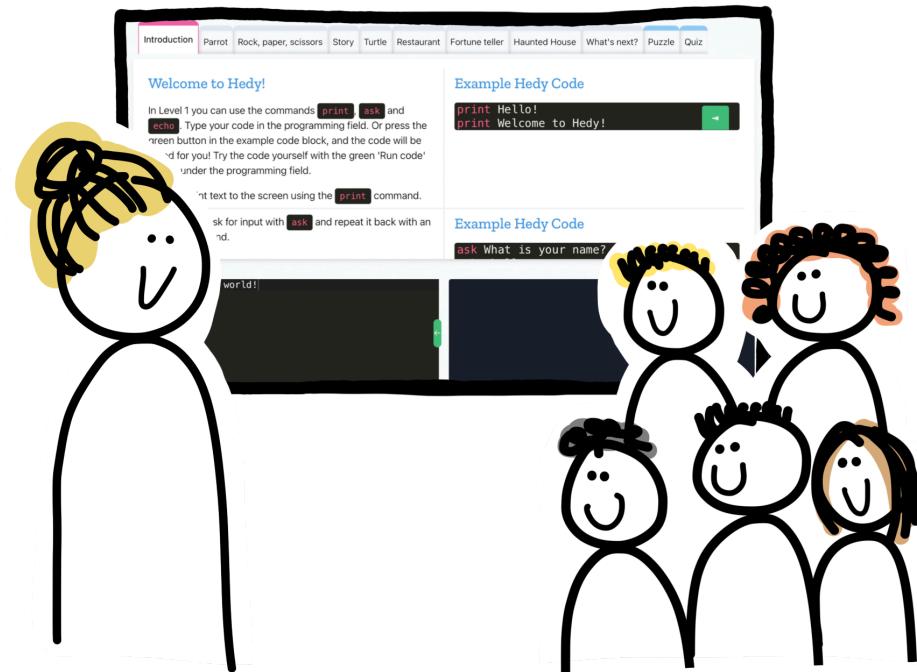
On the right, there is a drawing area with a turtle cursor and a preview of the randomly colored star drawing. At the bottom, there are buttons for 'Run code', 'Debug', 'Expand output', 'Save drawing', and a color palette.

Gradual syntax approach



- ▶ Teaching children syntax just like learning punctuation
- ▶ Gradually learning syntax and concepts

(Gilsing and Hermans, 2021; Hermans, 2020)



Gradual syntax approach



Figure 5: How students learn to write

Gradual syntax approach



Syntax in level 3:

Hedy

- 1 choices **is** stone, paper, scissors
- 2 **print** I choose **choices** **at random**

Syntax in level 16:

Hedy

- 1 choices = ['stone','paper','scissors']
- 2 **print**("I choose ", choices[random])

STUDENT INTERFACE



Levels and adventures



- ▶ Adventures guide step by step
- ▶ Levels: basic, advanced and expert

Home Hedy English Log in

Level 3 — random ▾

At random

In this level you can make a list using the `is` command. You can let the computer choose a random item from that list. You do that with `at random`.

You can use the `at random` command in a sentence as well.

Exercise

Try out the `at random` command by making your own gameshow (like the ones on tv) where you choose a door or suitcase and it contains a big prize! Can you do it? We have already put the first lines into the example code.

```
1 print The big gameshow!
2 print There are 3 suitcases in front of you...
3 chosen is ask Which suitcase do you choose?
4 prizes is
5
6
```

Run code Debug Expand output

Level 9 — draw it! ^

Level 1

Level 2

Level 3

Level 4

Level 5

Level 6

Level 7

Level 8

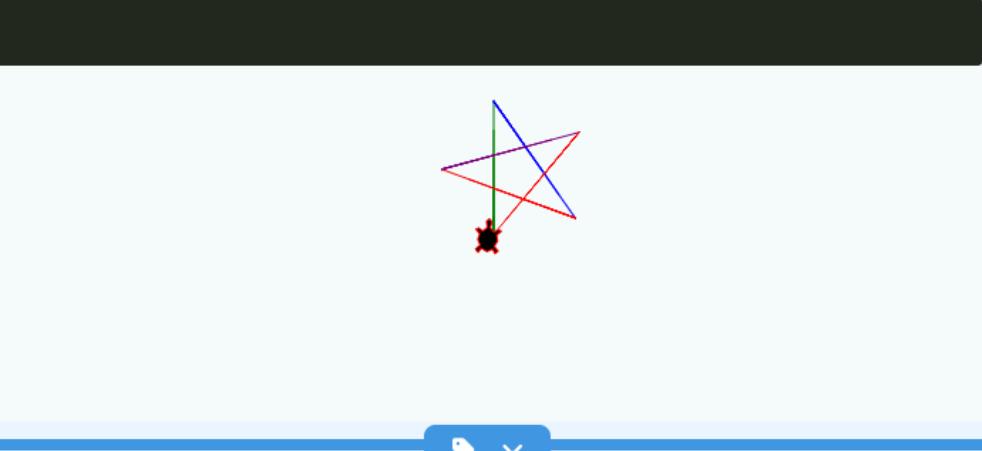
Level 9

- repeat
- fortune teller
- repeat 2
- sing a song!
- music
- if & else
- story

Levels and adventures



```
1 colors is red, green, blue, yellow, purple, pink
2 repeat 5 times
3   color colors at random
4   forward 100
5   turn 145
```



colors: red,green,blue,yellow,purple,pink

Run code Debug Expand output Save drawing

What will this code do?



Hedy

```
1 print("Hello there!")
```

Clear error messages and warnings



Hedy

```
1 print("Hello there!")
```

```
>>> print("Hello there!")
      File "<python-input-0>", line 1
          print("Hello there!")
IndentationError: unexpected indent
>>> |
```

Figure 9: Indentation error in Python

Clear error messages and warnings



Hedy

```
1 print("Hello there!")
```



We detected that line 2 started with a space. Can you try removing the space?



Figure 10: Indentation 'error' in level 2



We detected that **a space** is being used on line 7 which is not allowed. Can you try looking for a **a** missing or an extra character on your code?



Figure 11: Indentation error in level 6

Clear error messages and warnings



```
>>> print(friuts)
Traceback (most recent call last):
  File "<python-input-9>", line 1, in <module>
    print(friuts)
               ^
NameError: name 'friuts' is not defined
>>> |
```

Figure 12: Variable not found in Python

i We detected that variable `friuts` is being used before being set. Can you set the variable before it is used or use quotation marks for `friuts`? X

Figure 13: Variable not found in Hedy (level 14)



NATIVE LANGUAGE SUPPORT

Over 30 languages available!



English

Hedy

```
1 number_1 = numbers at random
```

Français

Hedy

```
1 nombre_1 = nombres au hasard
```

中文 (简体)

Hedy

```
1 数一 = 一组数 在 随机
```

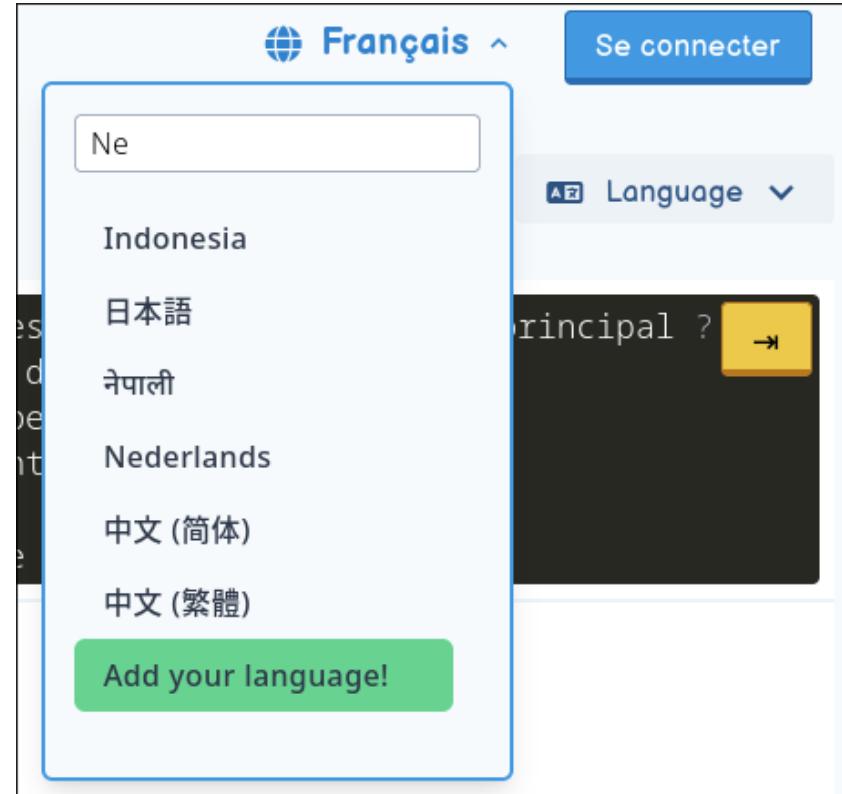
► And many more!

print hello
打印 你好
قول مرحبا

Help translating :)



- ▶ Is your language available?
 - No? Add your language!
 - Yes? Help with updating content!
- ▶ No programming experience needed!



TEACHER INTERFACE



Manage your classes



My classes

Create a class to follow the progress of each student in dashboard, and to customize the adventures your students see, and even adding your own! You can create as many classes as you like, and each class can have multiple teachers each one with different roles. You can also add as many students as you want, but mind that each student can only be in one class at a time. You can find more information about classes in the [teacher manual](#).

[Create a new class](#)[Hide classes ▾](#)

Name	Teacher	Students	Actions				
[REDACTED]	weijsenfeld	28	Customize	Update	Duplicate	Preview	Remove
[REDACTED]	weijsenfeld	30	Customize	Update	Duplicate	Preview	Remove
[REDACTED]	weijsenfeld	36	Customize	Update	Duplicate	Preview	Remove
Test	weijsenfeld	8	Customize	Updated	Duplicate	Preview	Remove

My adventures

Each Hedy level has built-in exercises for students, which we call adventures. You can create your own adventures and add them to your classes. With your own adventures you can create adventures that are relevant and interesting for your students. You can find more information about creating your own adventures [here](#).

[Create adventure](#)[View adventures ▾](#)

Fully customizable levels



[← Go back](#)

Customize class: Test 

Select and order adventures

Level 1  Add  Reset Create adventure

print  ask  parrot  rock, paper, scissors  haunted house  story  music  turtle  draw it!  restaurant  fortune teller  debugging  hospital  Vrij Programmeren 

Other settings

Option	Select?
Hide keyword switcher	<input type="checkbox"/>

Opening dates 

[Preview](#) [Remove customization](#)

Create custom adventures



← Go back

Customize adventure:

General settings Adventure ⓘ Preview Solution Example ⓘ

Paragraph Paragraph B I “ ” ≡ ≡ ↔ ↔ ↶ ↷ HTML

This is the explanation of my adventure! This way I can show a command: `print` But sometimes I might want to show a piece of code, like this:

```
ask What's your name?  
echo so your name is
```

Hedy

» Adventure Code

Use this button when you want to create a block of code that students can run in your adventure. Tip: put the selection at the end of the last line of the code block and `Enter` 3 times to type after a code block.

Make sure you always surround keywords with {} when you write them outside of code blocks, then they are recognized correctly. You can use the "preview" button to view a styled version of your adventure. To view the adventure on a dedicated page, select "view" from the teachers page.

Preview

Create student accounts



- ▶ No emails needed!

[← Go back](#)

Create student accounts for Test

Auto generate passwords

Usernames

Enter one username per line or paste them from a spreadsheet.

```
Madeline
Lucia
Femke
Thom
Dennis
Louis
Gabriel
```

[Create accounts](#)

ROADMAP 2026



Roadmap 2026



- ▶ Significant teacher interface improvements
- ▶ Workbooks

Roadmap 2026

Teacher interface changes: Grading



Redacted Class Name :)

Grading

The table shows programs submitted by your students. The filters will let you filter for all or one of a level, student and/or adventure; the filter becomes effective after clicking the 'Filter' button. By clicking on the buttons besides the table headers, you can also sort the table.

Level	All	Students	All	Adventures	All	Filter
LEVEL	STUDENT			ADVENTURE	DATE	ACCEPTED
1	[REDACTED]	debugging			▼ Apr 15, 2025	<input checked="" type="checkbox"/>
1	[REDACTED]	fortune teller			▼ Apr 15, 2025	<input checked="" type="checkbox"/>
		draw it!			^	
1	[REDACTED]	<pre>1 turn right 2 forward 15 3 turn left 4 forward 15 5 turn right 6 forward 15 7 turn left 8 forward 15 9 turn right 10 forward 15</pre>			Apr 15, 2025	<input checked="" type="checkbox"/>
		View program				
2	[REDACTED]	rock, paper, scissors 2			▼ Apr 15, 2025	<input checked="" type="checkbox"/>

Figure 20: Better interface to show and grade submitted programs

Roadmap 2026

Teacher interface changes: Creating new classes



Create a new class

Class name

Standard new class
Create a class with the adventures made by the Hedy team included.

Copy existing class
Create a new class including the settings and adventures from an existing class. This will not bring over students.
Class
 Invite the second teacher from the other class to this one?

Class without adventures
Create a class with no adventures included.

Figure 21: More options when creating a new class

Roadmap 2026

Teacher interface changes: Calm class overview



Classes

Active Classes

NAME	TEACHER	STUDENTS	CREATED	ACTIONS
redacted class 1	weijsenfeld	28	Apr 14, 2025	...
redacted class 2	weijsenfeld	30	Apr 7, 2025	...
redacted class 3	weijsenfeld	36	Apr 7, 2025	
Test	weijsenfeld	8	Nov 14, 2024	

[Create a new class](#)

- ✓ Grading
- ⚙️ Configure
- 📁 Archive
- trash Delete

Figure 22: Quick access to grading, configuration, archiving and deleting

Roadmap 2026

Teacher interface changes: All materials clearly in one place



A Web Page

https://

Home | Hedy | For teachers

My programs | Profile

Teaching materials

Prepare per level

Pick level to prepare

[Workbooks](#)

[Slides](#)

[What is Hedy?](#)

[How to create a class](#)

[How to teach with Hedy](#)

A Web Page

https://

Home | Hedy | For teachers

My programs | Profile

Teaching materials **Level 3**

[Slide](#)

[Workbook](#)

[Workbook solutions](#)

[Common mistakes](#)

Figure 23: Overview of all teaching materials

Figure 24: Prepare your class per level

Roadmap 2026

New workbooks



Question: Circle variables in this code:

```
name is Hedy
print Hello name
age is 17
print You are age years old
```

Question: Circle places where the variable is **being set** in this code:

```
name is Hedy
print Hello name
age is 17
print You are age years old
```

Question: Circle places where the variables are **being used** in this code:

```
name is Hedy
print Hello name
age is 17
print You are age years old
```

Output

Question: What is the output of this code?

```
teachers is Hermans, Merbis, Bagci, Senkal
print Today teachers at random will be teaching you!
```

Output

Question: What is the output of this code?

```
teachers is Hermans, Merbis, Bagci, Senkal
print Today's teacher is Hermans.
```

Figure 25: Students are asked questions on paper about variables

Figure 26: Students are asked to predict the output of the code

Many more ways to contribute!



- ▶ As a developer
- ▶ As an educator
- ▶ As a translator



print Hello

for times in range 1 to 10
print times ' x 4 = ' times * 4

Many more ways to contribute!



hedy.org



github.com/hedyorg/hedy

THANK YOU!

Hedy - Textual programming made easy



Bibliography



Gilsing, M., and Hermans, F. (2021). Gradual Programming in Hedy: A First User Study. *2021 IEEE Symposium on Visual Languages and Human-Centric Computing (VL/HCC)*, 1–9. <https://doi.org/10.1109/VL-HCC51201.2021.9576236>

Hermans, F. (2020). Hedy: A Gradual Language for Programming Education. *Proceedings of the 2020 ACM Conference on International Computing Education Research*, 259–270. <https://doi.org/10.1145/3372782.3406262>