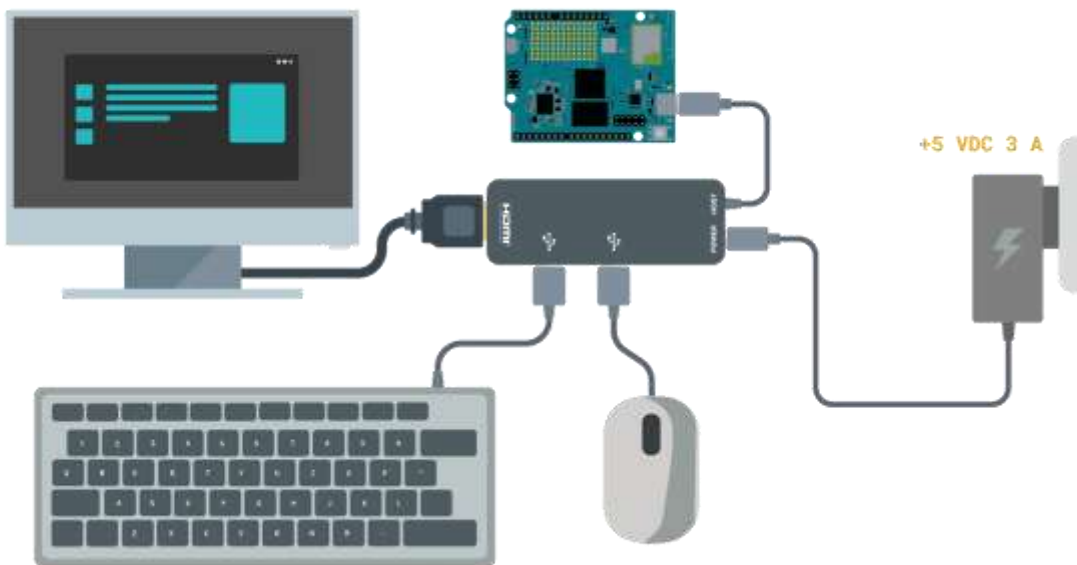




# Arduino Uno Q Local AI Agent



Python/Arduino

Studio5.qa

Let's Start

لنبدأ

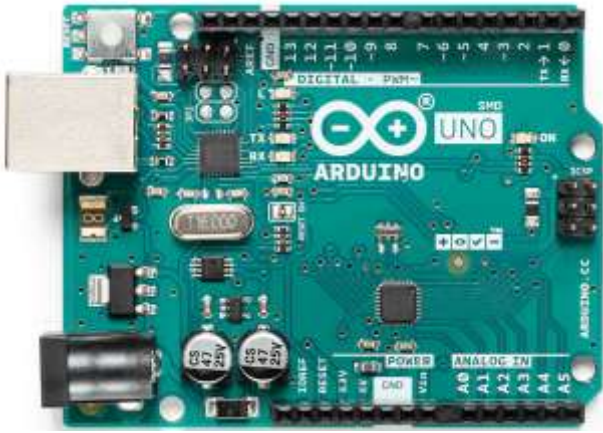


# Quick Comparison between Old Boards and Arduino Uno Q



- Hybrid Microprocessor
- Linux-capable hybrid board
- Designed for complex tasks computer vision, AI...
- Wi-Fi, Bluetooth, HDMI, mouse/keyboard input
- Camera/display connectors
- + All traditional Arduino Uno Functionalities

معالج دقيق هجين  
لوحة هجينة تدعم نظام لينكس  
...مصممة للمهام المعقدة، مثل رؤية الحاسوب والذكاء الاصطناعي  
لوحة المفاتيح / واي فاي، بلوتوث، مدخلات الفأرة  
الشاشة / موصلات الكاميرا  
**جميع وظائف أودوينو أونو التقليدية +**



- Low-power microcontrollers
- Real-time sensor/motor control
- Cost-effective and robust real-time automation projects

وحدات تحكم دقيقة منخفضة الطاقة  
المحركات في الوقت الحقيقي مشاريع / التحكم في المستشعرات  
أتمتة فعالة من حيث التكلفة وقوية في الوقت الحقيقي





## جدول أعمال اليوم Today's Agenda

Create your own Local AI Agent on ArduinoUnoQ

أنشئ وكيل الذكاء الاصطناعي المحلي الخاص بك على أردوينو أونو كيو

# Download and Install AppLab

# قم بتنزيل وتثبيت AppLab

<https://www.arduino.cc/en/software/#app-lab-section>



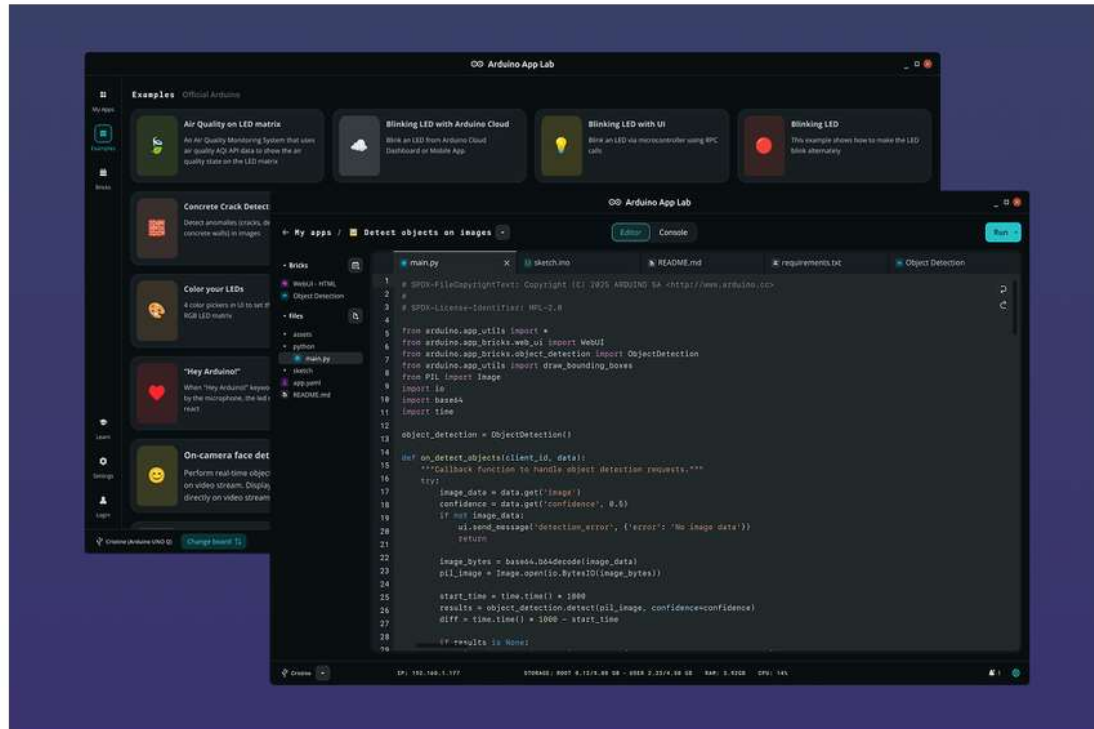
## Arduino App Lab 0.8.0

A powerful visual environment for managing your **UNO Q** board — combine prebuilt modules, called Bricks, with AI models to define your board's behavior with ease. App Lab supports both classic C++ sketches via the Arduino IDE and Python, giving you full flexibility to develop the way you prefer.

Windows (10/11), NSIS installer

**DOWNLOAD**

The Arduino App lab is Open Source under terms of **GPL 3.0 License** and its source code is available [here](#).



# Connect

<https://github.com/arduino>

## التوصيل



When it is connected by cable, it gives you both capabilities of connection.  
عند توصيل اللوحة بواسطة كابل، فإنها تمنحك كلا إمكانيات الاتصال.

For the Cable connection, it is straight forward.

For the Network connection (WIFI), it requires a Username and Password upon connection (for safety and security reasons)

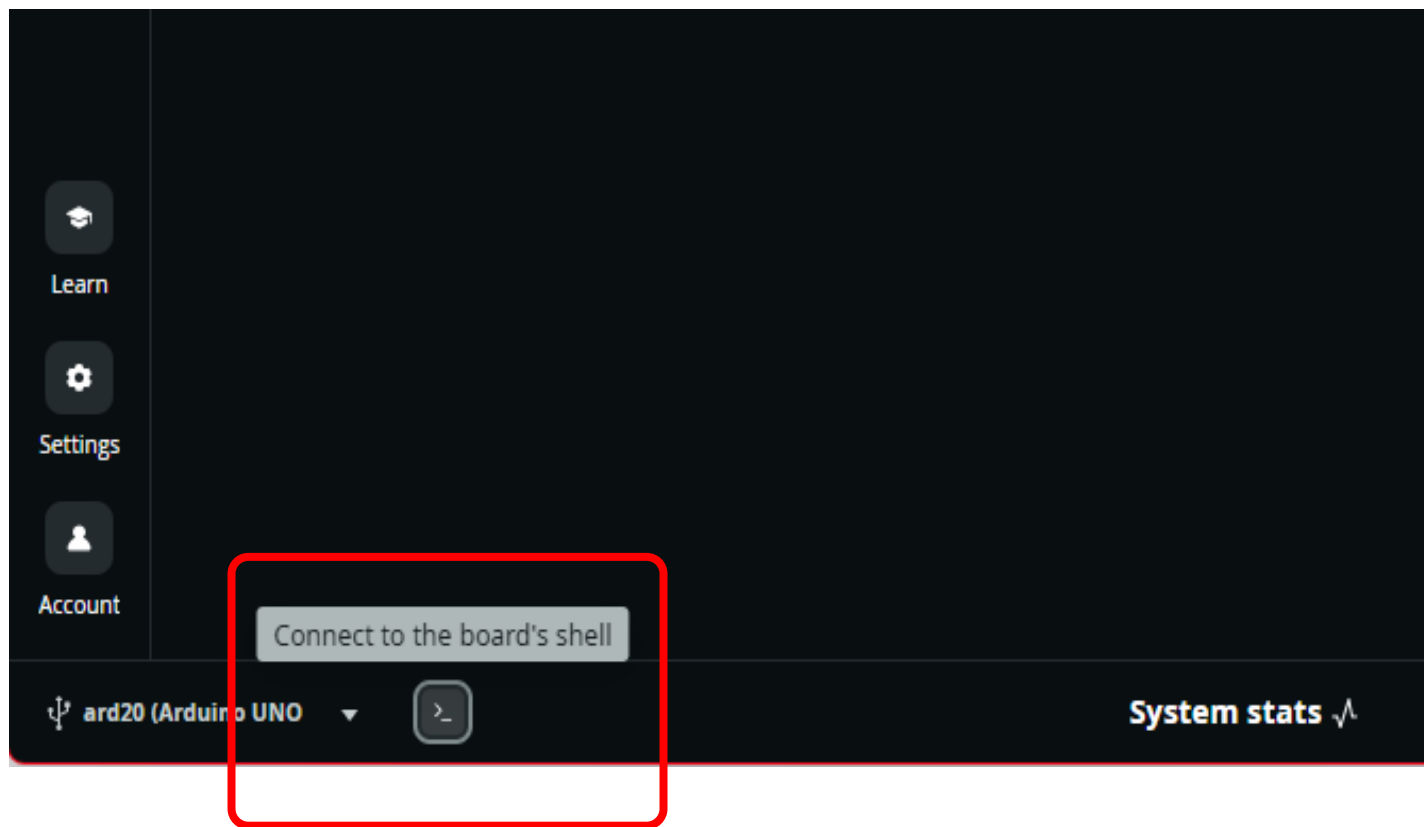
بالنسبة لتوصيل الكابل، فالأمر بسيط.  
أما بالنسبة لتوصيل الشبكة (WIFI)، فيتطلب الأمر اسم مستخدم وكلمة مرور عند الاتصال (لأسباب أمنية).

<https://docs.arduino.cc/tutorials/uno-q/user-manual/>



## Open the Linux Terminal

افتح طرفية لينكس

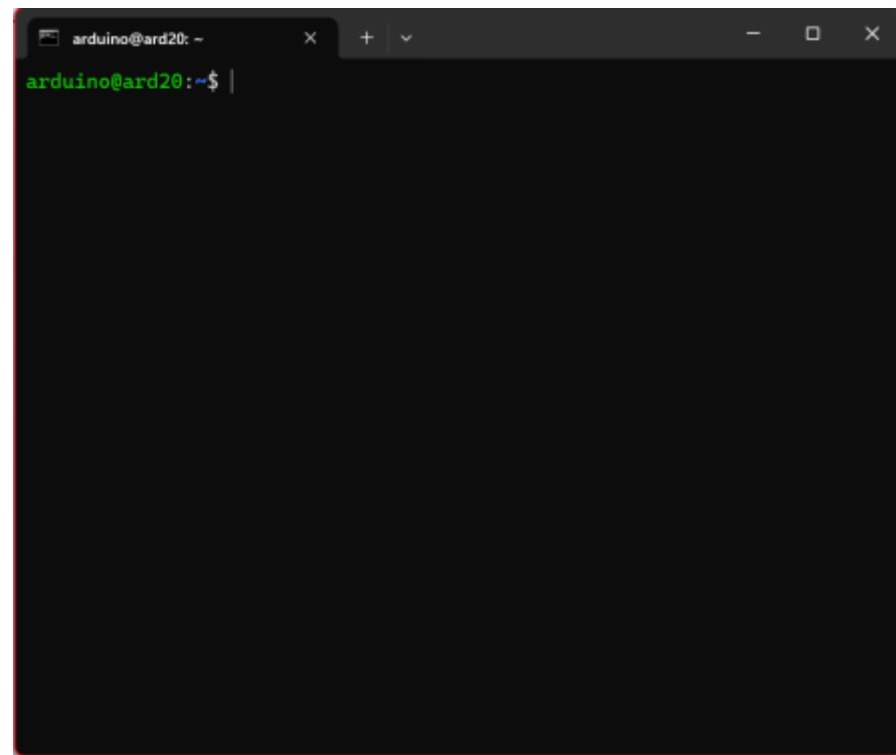


Click on >\_

It will open the Linux Terminal  
in a New Window

انقر على >\_

سيتم فتح نافذة طرفية لينكس  
في نافذة جديدة



# Coding in the Linux Terminal

## البرمجة في طرفية لينكس

Write the following:

اكتب ما يلي:

`mkdir localAgent`

Create a folder named localAgent

أنشئ مجلدًا باسم localAgent

`ls`

List all files and folder inside the directory

اعرض جميع الملفات والمجلدات داخل الدليل

```
arduino@ard20: ~  
$ mkdir localAgent
```

```
arduino@ard20: ~  
$ mkdir localAgent  
arduino@ard20: ~  
$ ls  
ArduinoApps  localAgent  lost+found  
arduino@ard20: ~  
$
```

Our folder is ready, let's start

ملفنا جاهز، فلنبدأ





# Coding in the Linux Terminal

البرمجة في طرفية لينكس

Write the following:

اكتب ما يلي:

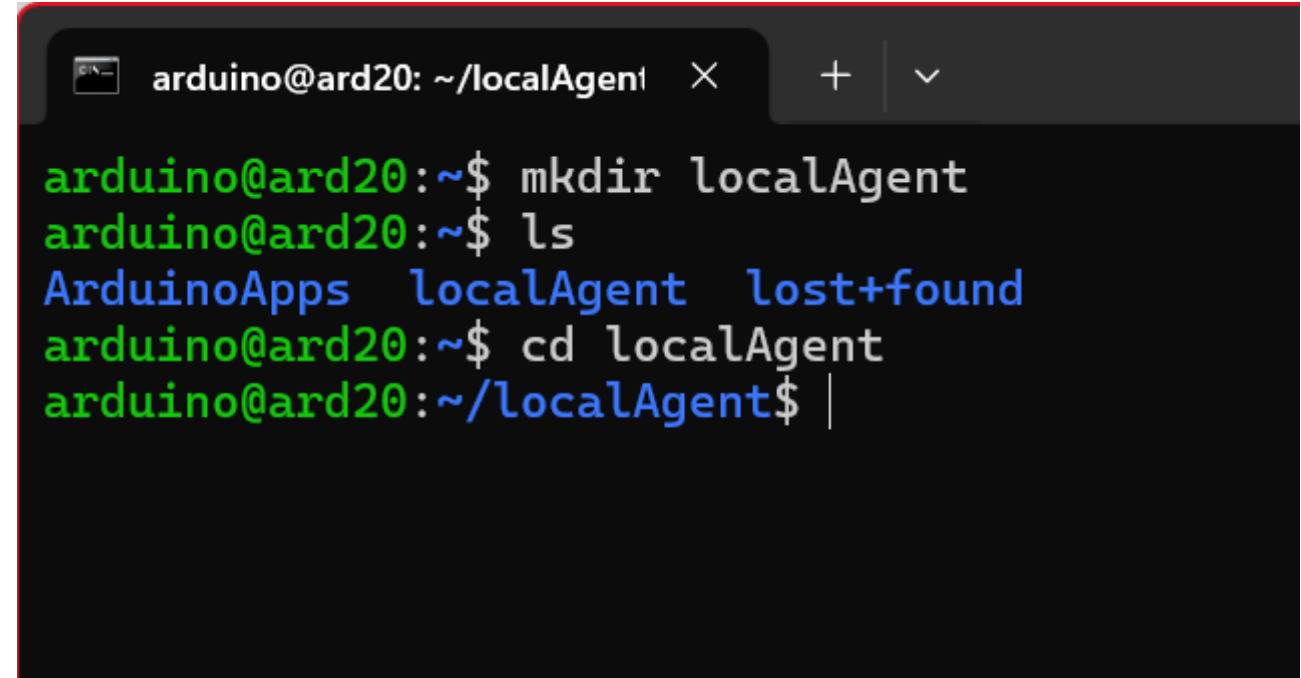
`cd localAgent`

Navigate to localAgent folder

انتقل إلى مجلد localAgent

Whatever we do now, will be inside the LocalAgent folder

أي شيء نفعله الآن، سيكون داخل مجلد LocalAgent



```
arduino@ard20: ~/localAgent × + ▾  
arduino@ard20:~$ mkdir localAgent  
arduino@ard20:~$ ls  
ArduinoApps localAgent lost+found  
arduino@ard20:~$ cd localAgent  
arduino@ard20:~/localAgent$ |
```



## Download Llamafire runtime

## قم بتنزيل وقت تشغيل Llamafire

Write the following:

اكتب ما يلي:

```
curl -LO https://github.com/mozilla-ai/llamafire/releases/download/0.10.0/llamafire-0.10.0
```

Download the llamafire

قم بتنزيل ملف llamafire

```
arduino@ard20: ~/localAgent
arduino@ard20:~$ mkdir localAgent
arduino@ard20:~$ ls
ArduinoApps  localAgent  lost+found
arduino@ard20:~/localAgent$ curl -LO https://github.com/mozilla-ai/llamafire/releases/download/0.10.0/llamafire-0.10.0
```

```
arduino@ard20: ~/localAgent
arduino@ard20:~$ mkdir localAgent
arduino@ard20:~$ ls
ArduinoApps  localAgent  lost+found
arduino@ard20:~/localAgent$ curl -LO https://github.com/mozilla-ai/llamafire/releases/download/0.10.0/llamafire-0.10.0
% Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
           Dload  Upload   Total   Spent    Left     Speed
  0     0    0     0    0     0      0  0 --:--:--  0:00:01 --:--:--    0
100 721M 100 6880k    0     0  707k      0  0:17:24  0:00:09  0:17:15 1116k
```

```
arduino@ard20: ~/localAgent
arduino@ard20:~$ mkdir localAgent
arduino@ard20:~$ ls
ArduinoApps  localAgent  lost+found
arduino@ard20:~/localAgent$ curl -LO https://github.com/mozilla-ai/llamafire/releases/download/0.10.0/llamafire-0.10.0
% Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
           Dload  Upload   Total   Spent    Left     Speed
  0     0    0     0    0     0      0  0 --:--:--  0:00:01 --:--:--    0
100 721M 100 721M    0     0 2543k      0  0:04:50  0:04:50 --:--:-- 3006k
arduino@ard20:~/localAgent$ ls
llamafire-0.10.0
arduino@ard20:~/localAgent$
```



## Make the runtime executable and Rename it

اجعل ملف التشغيل قابلاً للتنفيذ وأعد تسميته

Write the following:

اكتب ما يلي:

`chmod +x llamafire-0.10.0`

Make the runtime Executable

اجعل ملف التشغيل قابلاً للتنفيذ

`mv llamafire-0.10.0 llamafire`

Rename it

أعد تسميته

```
arduino@ard20: ~/localAgent
arduino@ard20:~$ mkdir localAgent
arduino@ard20:~$ ls
ArduinoApps  localAgent  lost+found
arduino@ard20:~/localAgent$ curl -LO https://github.com/mozilla-ai/llamafire/releases/download/0.10.0/llamafire-0.10.0
% Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
           %             %             Dload  Upload  Total  Spent  Left  Speed
100  721M  100  721M    0     0  2543k      0  0:04:50  0:04:50 --:--:-- 3006k
arduino@ard20:~/localAgent$ ls
llamafire-0.10.0
arduino@ard20:~/localAgent$ chmod +x llamafire-0.10.0
arduino@ard20:~/localAgent$ mv llamafire-0.10.0 llamafire
arduino@ard20:~/localAgent$ ls
llamafire
arduino@ard20:~/localAgent$ |
```



# Download Qwen model and make it Executable

## قم بتنزيل نموذج كوين واجعله قابلاً للاستخدام

Write the following:

اكتب ما يلي:

```
curl -LO https://huggingface.co/Mozilla/Qwen3-0.6B-  
llamafire/resolve/main/Qwen_Qwen3-0.6B-Q4_K_M.llamafire
```

Download Qwen model

قم بتنزيل نموذج كوين

```
arduino@ard20: ~/localAgent  
$ mkdir localAgent  
$ ls  
ArduinoApps localAgent lost+found  
$ curl -LO https://github.com/mozilla-ai/llamafire/releases/download/0.10.0/llamafire-0.10.0  
% Total % Received % Xferd Average Speed Time Time Time Current  
t  
0 0 0 0 0 0 0 0 --:--:-- 0:00:01 --:--:-- 0  
100 721M 100 721M 0 0 2543k 0 0:04:50 0:04:50 --:--:-- 3006k  
$ ls  
llamafire-0.10.0  
$ chmod +x llamafire-0.10.0  
$ mv llamafire-0.10.0 llamafire  
$ ls  
llamafire  
$ curl -LO https://huggingface.co/Mozilla/Qwen3-0.6B-  
-llamafire/resolve/main/Qwen_Qwen3-0.6B-Q4_K_M.llamafire
```

```
arduino@ard20:~/localAgent$ ls  
llamafire  
arduino@ard20:~/localAgent$ curl -LO https://huggingface.co/Mozilla/Qwen3-0.6B-  
-llamafire/resolve/main/Qwen_Qwen3-0.6B-Q4_K_M.llamafire  
% Total % Received % Xferd Average Speed Time Time Time Current  
t  
Dload Upload Total Spent Left Speed  
100 113 100 113 0 0 109 0 0:00:01 0:00:01 --:--:-- 109  
100 1054 100 1054 0 0 538 0 0:00:01 0:00:01 --:--:-- 10233  
1 755M 1 12.4M 0 0 1207k 0 0:10:40 0:00:10 0:10:30 2405k
```

```
arduino@ard20:~/localAgent$ ls  
llamafire  
arduino@ard20:~/localAgent$ curl -LO https://huggingface.co/Mozilla/Qwen3-0.6B-  
-llamafire/resolve/main/Qwen_Qwen3-0.6B-Q4_K_M.llamafire  
% Total % Received % Xferd Average Speed Time Time Time Current  
t  
Dload Upload Total Spent Left Speed  
100 113 100 113 0 0 109 0 0:00:01 0:00:01 --:--:-- 109  
100 1054 100 1054 0 0 538 0 0:00:01 0:00:01 --:--:-- 10233  
100 755M 100 755M 0 0 1809k 0 0:07:07 0:07:07 --:--:-- 2506k  
arduino@ard20:~/localAgent$
```

```
100 113 100 113 0 0 109 0 0:00:01 0:00:01 --:--:-- 109  
100 1054 100 1054 0 0 538 0 0:00:01 0:00:01 --:--:-- 10233  
100 755M 100 755M 0 0 1809k 0 0:07:07 0:07:07 --:--:-- 2506k  
arduino@ard20:~/localAgent$ ls  
llamafire Qwen_Qwen3-0.6B-Q4_K_M.llamafire  
arduino@ard20:~/localAgent$
```



## Download Qwen model and make it Executable

قم بتنزيل نموذج كوين واجعله قابلاً للاستخدام

Write the following:

اكتب ما يلي:

```
chmod +x Qwen_Qwen3-0.6B-Q4_K_M.llamafile
```

Make the model Executable

اجعل ملف النموذج قابلاً للتنفيذ

```
100 113 100 113 0 0 109 0 0:00:01 0:00:01 --:--:
100 1054 100 1054 0 0 538 0 0:00:01 0:00:01 --:--:
100 755M 100 755M 0 0 1809k 0 0:07:07 0:07:07 --:--:
arduino@ard20:~/localAgent$ ls
llamafile Qwen_Qwen3-0.6B-Q4_K_M.llamafile
arduino@ard20:~/localAgent$ chmod +x Qwen_Qwen3-0.6B-Q4_K_M.llamafile
```

Everything is Ready!  
Let's Run our Local AI Agent!

```
100 755M 100 755M 0 0 1809k 0 0:07:07 0:07:07 --:--:
arduino@ard20:~/localAgent$ ls
llamafile Qwen_Qwen3-0.6B-Q4_K_M.llamafile
arduino@ard20:~/localAgent$ chmod +x Qwen_Qwen3-0.6B-Q4_K_M.llamafile
arduino@ard20:~/localAgent$ ls
llamafile Qwen_Qwen3-0.6B-Q4_K_M.llamafile
arduino@ard20:~/localAgent$ |
```

كل شيء جاهز!  
هيا بنا نشغل وكيل الذكاء الاصطناعي المحلي!





# Starting our Local AI Agent

بدء تشغيل وكيل الذكاء الاصطناعي المحلي الخاص بنا

Write the following:

اكتب ما يلي:

`./Qwen_Qwen3-0.6B-Q4_K_M.llamafile`

Starting our Local AI Agent

بدء تشغيل وكيل الذكاء الاصطناعي المحلي

```
100 753M 100 753M 0 0 1805K 0 0.07:07 0.07:07 .  
arduino@ard20:~/localAgent$ ls  
llamafile Qwen_Qwen3-0.6B-Q4_K_M.llamafile  
arduino@ard20:~/localAgent$ chmod +x Qwen_Qwen3-0.6B-Q4_K_M.llamafile  
arduino@ard20:~/localAgent$ ls  
llamafile Qwen_Qwen3-0.6B-Q4_K_M.llamafile  
arduino@ard20:~/localAgent$ ./Qwen_Qwen3-0.6B-Q4_K_M.llamafile
```

```
arduino@ard20:~/localAgent$ ls  
llamafile Qwen_Qwen3-0.6B-Q4_K_M.llamafile  
arduino@ard20:~/localAgent$ chmod +x Qwen_Qwen3-0.6B-Q4_K_M.llamafile  
arduino@ard20:~/localAgent$ ls  
llamafile Qwen_Qwen3-0.6B-Q4_K_M.llamafile  
arduino@ard20:~/localAgent$ ./Qwen_Qwen3-0.6B-Q4_K_M.llamafile
```

```
LLAMAFILE  
| loading model...
```



## Starting our Local AI Agent

بدء تشغيل وكيل الذكاء الاصطناعي المحلي الخاص بنا

```
arduino@ard20:~/localAgent$ ls
llamafile  Qwen_Qwen3-0.6B-Q4_K_M.llamafile
arduino@ard20:~/localAgent$ ./Qwen_Qwen3-0.6B-Q4_K_M.llamafile

LLAMAFILE

software: llamafile 0.9.3
model:    Qwen_Qwen3-0.6B-Q4_K_M.gguf
compute:
server:   http://127.0.0.1:8080/

A chat between a curious human and an artificial intelligence assistant. The a
ssistant gives helpful, detailed, and polite answers to the human's questions.
>>> |say something (or type /help for help)
```

Our Local AI Agent is Runnig and Waiting for our Prompt

يعمل وكيل الذكاء الاصطناعي المحلي لدينا ويانتظر طلبك.



# Prompting our Local AI Agent

# استشر وكيل الذكاء الاصطناعي المحلي لدينا

```
llamafile Qwen_Qwen3-0.6B-Q4_K_M.llamafile
arduino@ard20:~/localAgent$ ./Qwen_Qwen3-0.6B-Q4_K_M.llamafile

LLAMAFILE

software: llamafile 0.9.3
model: Qwen_Qwen3-0.6B-Q4_K_M.gguf
compute:
server: http://127.0.0.1:8080/

A chat between a curious human and an artificial intelligence assistant. The assistant gives helpful, detailed, and polite answers to the human's questions.
>>> tell me something about Arduino Uno Q
<think>
Okay, the user is asking about the Arduino Uno Q. First, I need to confirm if they meant the Arduino Uno or the Q series. The Arduino Uno is a standard board, but the Q series might be a different model. I should check the correct model. The user might have confused the names. I should explain that the Arduino Uno is the standard, and the Q series is a different model. Also, mention key features like the 1600MHz clock,
```

```
arduino@ard20: ~/localAgent x + v
arduino@ard20:~/localAgent$ ls
llamafile Qwen_Qwen3-0.6B-Q4_K_M.llamafile
arduino@ard20:~/localAgent$ ./Qwen_Qwen3-0.6B-Q4_K_M.llamafile

LLAMAFILE

software: llamafile 0.9.3
model: Qwen_Qwen3-0.6B-Q4_K_M.gguf
compute:
server: http://127.0.0.1:8080/

A chat between a curious human and an artificial intelligence assistant. The assistant gives helpful, detailed, and polite answers to the human's questions.
>>> tell me something about Arduino Uno Q
<think>
Okay, the user is asking about the Arduino Uno Q. First, I need to confirm if they meant the Arduino Uno or the Q series. The Arduino Uno is a standard board, but the Q series might be a different model. I should check the correct model. The user might have confused the names. I should explain that the Arduino Uno is the standard, and the Q series is a different model. Also, mention key features like the 1600MHz clock, 10-bit resolution, and the 5V power supply. Maybe add some examples of applications like robotics or home automation. Make sure the response is clear and helpful, avoiding any confusion.
</think>

The Arduino Uno Q is a variant of the Arduino Uno board, designed for a 1600MHz clock and 10-bit resolution. It features a 5V power supply and supports a 100MHz clock, making it ideal for applications requiring precise timing. Key features include the 1600MHz clock, 10-bit resolution, and a 5V power supply. It is commonly used in robotics, home automation, and other projects requiring low-power operation. Let me know if you'd like more details!
>>> |
```





```
mkdir localAgent
```

```
cd localAgent
```

```
curl -LO https://github.com/mozilla-ai/llamafire/releases/download/0.10.0/llamafire-0.10.0
```

```
chmod +x llamafire-0.10.0
```

```
mv llamafire-0.10.0 llamafire
```

```
curl -LO https://huggingface.co/Mozilla/Qwen3-0.6B-llamafire/resolve/main/Qwen\_Qwen3-0.6B-Q4\_K\_M.llamafire
```

```
chmod +x Qwen_Qwen3-0.6B-Q4_K_M.llamafire
```

```
./Qwen_Qwen3-0.6B-Q4_K_M.llamafire
```

