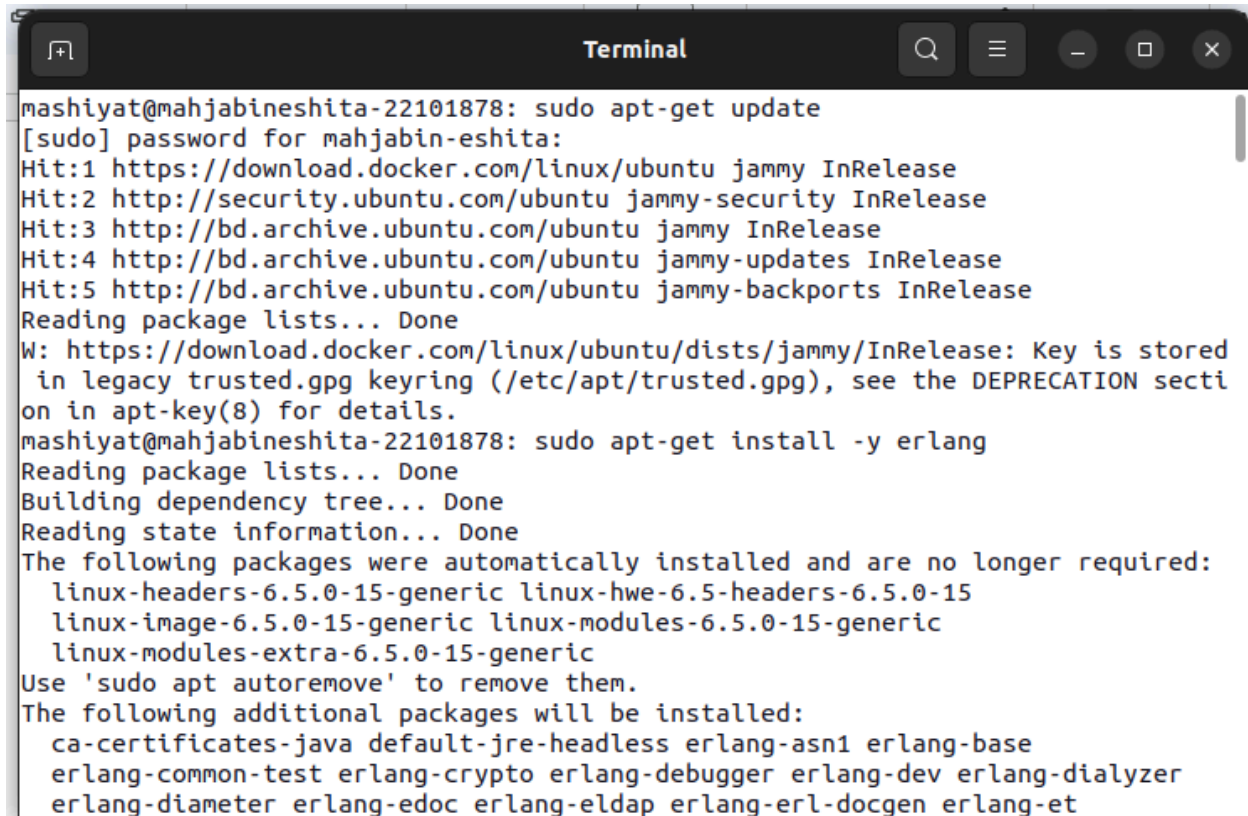


To update my system before starting I used **sudo apt-get update**

Then I used **sudo apt-get install -y erlang** to Install Erlang to install the Erlang programming language on my UNIX system.

A terminal window titled "Terminal" with standard Ubuntu window controls. The terminal shows the execution of two commands. The first command is 'sudo apt-get update', which prompts for a password and then lists several package updates from various sources, including Docker, Ubuntu security, and backports. The second command is 'sudo apt-get install -y erlang', which lists additional packages that will be installed along with Erlang, such as Java certificates, JRE, and various Erlang modules.

```
mashiyat@mahjabineshita-22101878: sudo apt-get update
[sudo] password for mahjabin-eshita:
Hit:1 https://download.docker.com/linux/ubuntu jammy InRelease
Hit:2 http://security.ubuntu.com/ubuntu jammy-security InRelease
Hit:3 http://bd.archive.ubuntu.com/ubuntu jammy InRelease
Hit:4 http://bd.archive.ubuntu.com/ubuntu jammy-updates InRelease
Hit:5 http://bd.archive.ubuntu.com/ubuntu jammy-backports InRelease
Reading package lists... Done
W: https://download.docker.com/linux/ubuntu/dists/jammy/InRelease: Key is stored
  in legacy trusted.gpg keyring (/etc/apt/trusted.gpg), see the DEPRECATION secti
on in apt-key(8) for details.
mashiyat@mahjabineshita-22101878: sudo apt-get install -y erlang
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following packages were automatically installed and are no longer required:
  linux-headers-6.5.0-15-generic linux-hwe-6.5-headers-6.5.0-15
  linux-image-6.5.0-15-generic linux-modules-6.5.0-15-generic
  linux-modules-extra-6.5.0-15-generic
Use 'sudo apt autoremove' to remove them.
The following additional packages will be installed:
  ca-certificates-java default-jre-headless erlang-asn1 erlang-base
  erlang-common-test erlang-crypto erlang-debugger erlang-dev erlang-dialyzer
  erlang-diameter erlang-edoc erlang-eldap erlang-erl-docgen erlang-et
```

Then I used **echo 'deb http://www.rabbitmq.com/debian/ testing main' | sudo tee /etc/apt/sources.list.d/rabbitmq.list** to add the RabbitMQ repository to my APT sources list. Mainly it allows me to install RabbitMQ using APT. After running this command I have to run **sudo apt-get update** to update my package lists with my new repository. Then, I can install RabbitMQ with **sudo apt-get install rabbitmq-server**.

```
done.
mashiyat@mahjabineshita-22101878: ^C
mashiyat@mahjabineshita-22101878: echo 'deb http://www.rabbitmq.com/debian/ test
ing main' | sudo tee /etc/apt/sources.list.d/rabbitmq.list
deb http://www.rabbitmq.com/debian/ testing main
mashiyat@mahjabineshita-22101878: wget -O- https://www.rabbitmq.com/rabbitmq-rel
ease-signing-key.asc | sudo apt-key add -
--2024-03-31 17:09:19-- https://www.rabbitmq.com/rabbitmq-release-signing-key.a
sc
Resolving www.rabbitmq.com (www.rabbitmq.com)... Warning: apt-key is deprecated.
Manage keyring files in trusted.gpg.d instead (see apt-key(8)).
104.20.10.224, 172.67.16.25, 104.20.11.224, ...
Connecting to www.rabbitmq.com (www.rabbitmq.com)|104.20.10.224|:443... connecte
d.
HTTP request sent, awaiting response... 200 OK
Length: 3187 (3.1K) [application/pgp-signature]
Saving to: 'STDOUT'

-                  100%[=====>]    3.11K  ---KB/s    in 0s

2024-03-31 17:09:23 (58.1 MB/s) - written to stdout [3187/3187]

OK
mashiyat@mahjabineshita-22101878: █
```

Adding the RabbitMQ public key to the trusted key list to avoid any warnings about unsigned packages using this:

wget -O- <https://www.rabbitmq.com/rabbitmq-release-signing-key.asc> | sudo apt-key add -

```
Terminal
ease-signing-key.asc | sudo apt-key add -
--2024-03-31 17:09:19-- https://www.rabbitmq.com/rabbitmq-release-signing-key.a
sc
Resolving www.rabbitmq.com (www.rabbitmq.com)... Warning: apt-key is deprecated.
Manage keyring files in trusted.gpg.d instead (see apt-key(8)).
104.20.10.224, 172.67.16.25, 104.20.11.224, ...
Connecting to www.rabbitmq.com (www.rabbitmq.com)|104.20.10.224|:443... connecte
d.
HTTP request sent, awaiting response... 200 OK
Length: 3187 (3.1K) [application/pgp-signature]
Saving to: 'STDOUT'

-                  100%[=====>]   3.11K  --.-KB/s    in 0s

2024-03-31 17:09:23 (58.1 MB/s) - written to stdout [3187/3187]

OK
mashiyat@mahjabineshita-22101878: ^[[200~wget -O- https://www.rabbitmq.com/rabbi
tmq-release-signing-key.asc | sudo apt-key add -
Warning: apt-key is deprecated. Manage keyring files in trusted.gpg.d instead (s
ee apt-key(8)).
wget: command not found
gpg: no valid OpenPGP data found.
mashiyat@mahjabineshita-22101878: ~
```

```

OK
mashiyat@mahjabineshita-22101878: ^[[200~wget -O- https://www.rabbitmq.com/rabbitmq-release-signing-key.asc | sudo apt-key add -
Warning: apt-key is deprecated. Manage keyring files in trusted.gpg.d instead (see apt-key(8)).
wget: command not found
gpg: no valid OpenPGP data found.
mashiyat@mahjabineshita-22101878: ~sudo apt-get update
Command '~sudo' not found, did you mean:
  command 'sudo' from deb sudo (1.9.9-1ubuntu2.4)
  command 'sudo' from deb sudo-ldap (1.9.9-1ubuntu2.4)
Try: sudo apt install <deb name>
mashiyat@mahjabineshita-22101878: sudo apt-get install -y rabbitmq-server
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following packages were automatically installed and are no longer required:
  linux-headers-6.5.0-15-generic linux-hwe-6.5-headers-6.5.0-15
  linux-image-6.5.0-15-generic linux-modules-6.5.0-15-generic
  linux-modules-extra-6.5.0-15-generic
Use 'sudo apt autoremove' to remove them.
The following additional packages will be installed:
  socat
The following NEW packages will be installed:

```

```

ice → /lib/systemd/system/rabbitmq-server.service.
Processing triggers for man-db (2.10.2-1) ...
mashiyat@mahjabineshita-22101878: sudo systemctl status rabbitmq-server
● rabbitmq-server.service - RabbitMQ Messaging Server
   Loaded: loaded (/lib/systemd/system/rabbitmq-server.service; enabled; vendor preset: enabled)
   Active: active (running) since Sun 2024-03-31 17:20:33 +06; 1min 6s ago
     Main PID: 8121 (beam.smp)
        Tasks: 23 (limit: 8215)
      Memory: 92.9M
         CPU: 2.323s
       CGroup: /system.slice/rabbitmq-server.service
               └─8121 /usr/lib/erlang/erts-12.2.1/bin/beam.smp -W w -MBas ageffcb
                 └─8139 erl_child_setup 65536
                   └─8217 inet_gethost 4
                     └─8218 inet_gethost 4

Mar 31 17:20:30 mahjabineshita systemd[1]: Starting RabbitMQ Messaging Server...
Mar 31 17:20:33 mahjabineshita systemd[1]: Started RabbitMQ Messaging Server.
lines 1-15/15 (END)

```

```
Terminal
command 'sudo' from deb sudo (1.9.9-1ubuntu2.4)
command 'sudo' from deb sudo-ldap (1.9.9-1ubuntu2.4)
Try: sudo apt install <deb name>
mashiyat@mahjabineshita-22101878: sudo apt-get install -y rabbitmq-server
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following packages were automatically installed and are no longer required:
  linux-headers-6.5.0-15-generic linux-hwe-6.5-headers-6.5.0-15
  linux-image-6.5.0-15-generic linux-modules-6.5.0-15-generic
  linux-modules-extra-6.5.0-15-generic
Use 'sudo apt autoremove' to remove them.
The following additional packages will be installed:
  socat
The following NEW packages will be installed:
  rabbitmq-server socat
0 upgraded, 2 newly installed, 0 to remove and 141 not upgraded.
Need to get 15.5 MB of archives.
After this operation, 24.3 MB of additional disk space will be used.
Get:1 http://bd.archive.ubuntu.com/ubuntu jammy/main amd64 socat amd64 1.7.4.1-3
ubuntu4 [349 kB]
Get:2 http://bd.archive.ubuntu.com/ubuntu jammy-updates/main amd64 rabbitmq-serv
er all 3.9.13-1ubuntu0.22.04.2 [15.2 MB]
79% [2 rabbitmq-server 13.0 MB/15.2 MB 86%] 302 kB/s 7s
```

Used command: **sudo systemctl status rabbitmq-server** ; here I used this command to check if my server is running properly or not but from my photo we can see that my server is working properly.

```

~
~
lines 1-15/15 (END)
mashiyat@mahjabineshita-22101878: sudo systemctl status rabbitmq-server
● rabbitmq-server.service - RabbitMQ Messaging Server
   Loaded: loaded (/lib/systemd/system/rabbitmq-server.service; enabled; vend
   Active: active (running) since Sun 2024-03-31 17:20:33 +06; 2min 44s ago
 Main PID: 8121 (beam.smp)
    Tasks: 23 (limit: 8215)
   Memory: 92.9M
      CPU: 2.636s
   CGroup: /system.slice/rabbitmq-server.service
           └─8121 /usr/lib/erlang/erts-12.2.1/bin/beam.smp -W w -MBas ageffcb
             └─8139 erl_child_setup 65536
               └─8217 inet_gethost 4
                 └─8218 inet_gethost 4

Mar 31 17:20:30 mahjabineshita systemd[1]: Starting RabbitMQ Messaging Server...
Mar 31 17:20:33 mahjabineshita systemd[1]: Started RabbitMQ Messaging Server.
lines 1-15/15 (END)

```

Initial set up done, checked the server is working

TASK 1: "Hello World!"

```

Terminal
Mar 31 17:20:33 mahjabineshita systemd[1]: Started RabbitMQ Messaging Server.

mashiyat@mahjabineshita-22101878: python -m pip install pika --upgrade
Command 'python' not found, did you mean:
  command 'python3' from deb python3
  command 'python' from deb python-is-python3
mashiyat@mahjabineshita-22101878: sudo python3 -m pip install pika --upgrade
/usr/bin/python3: No module named pip
mashiyat@mahjabineshita-22101878: sudo python3 -m pip install pika --upgrade
/usr/bin/python3: No module named pip
mashiyat@mahjabineshita-22101878: sudo python3-pip install pika --upgrade
sudo: python3-pip: command not found
mashiyat@mahjabineshita-22101878: sudo python3 -m pip install pika --upgrade
/usr/bin/python3: No module named pip
mashiyat@mahjabineshita-22101878: sudo python3 -m pip install pika --upgrade
Collecting pika
  Downloading pika-1.3.2-py3-none-any.whl (155 kB)
    ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 155.4/155.4 KB 550.2 kB/s eta 0:00:00
Installing collected packages: pika
Successfully installed pika-1.3.2
WARNING: Running pip as the 'root' user can result in broken permissions and con
flicting behaviour with the system package manager. It is recommended to use a v
irtual environment instead: https://pip.pypa.io/warnings/venv
mashiyat@mahjabineshita-22101878:

```


Now I used **sudo apt-get install python3-pip** for further work then used **sudo python3 -m pip install pika --upgrade**

Here I have installed Pika's latest version

Now I am writing the **producer.py** file using this code

Here I have written the code that I have taken from RabbitMQ website and this code uses a channel to connect with pika.

```
import pika
```

```
connection = pika.BlockingConnection(pika.ConnectionParameters('localhost'))  
channel = connection.channel()
```

```
channel.queue_declare(queue='hello')
```

```
channel.basic_publish(exchange='', routing_key='hello', body='Hello World!')  
print(" Producer Sent 'Hello World!'")
```

```
connection.close()
```

A screenshot of a code editor window titled '*consumer.py'. The editor shows the following Python code:

```
1  
2 import pika  
3  
4 connection = pika.BlockingConnection(pika.ConnectionParameters('localhost'))  
5 channel = connection.channel()  
6  
7 channel.queue_declare(queue='hello')  
8  
9 channel.basic_publish(exchange='', routing_key='hello', body='Hello World!')  
10 print(" Producer Sent 'Hello World!'")  
11  
12 connection.close()  
13 |
```

Then I wrote **consumer.py** code in a text file then I saved it using .py.

```
import pika
```

```
connection = pika.BlockingConnection(pika.ConnectionParameters('localhost'))  
channel = connection.channel()
```

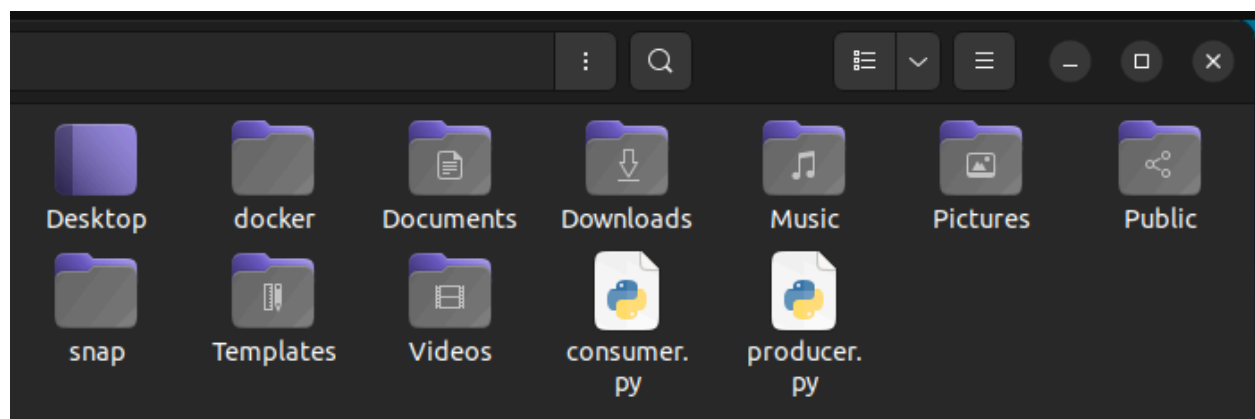
```
channel.queue_declare(queue='hello')
```

```
def callback(ch, method, properties, body):  
    print("Consumer Received %r" % body)
```

```
channel.basic_consume(queue='hello', on_message_callback=callback, auto_ack=True)
```

```
print(' Consumer Waiting for messages. To exit press CTRL+C')  
channel.start_consuming()
```

```
import pika  
  
connection = pika.BlockingConnection(pika.ConnectionParameters('localhost'))  
channel = connection.channel()  
  
channel.queue_declare(queue='hello')  
  
def callback(ch, method, properties, body):  
    print(" Consumer Received %r" % body)  
  
channel.basic_consume(queue='hello', on_message_callback=callback, auto_ack=True)  
  
print(' Consumer Waiting for messages. To exit press CTRL+C')  
channel.start_consuming()
```



Now I am running the Python scripts using,
python3 producer.py then I used **python3 consumer.py**


```
mashiyat@mahjabineshita-22101878: python3 producer.py
Producer Sent 'Hello World!'
mashiyat@mahjabineshita-22101878: python3 consumer.py
Consumer Waiting for messages. To exit press CTRL+C
Consumer Received b'Hello World!'
```

Here, In my terminal, the output is clearly shown. So, it is fully working.

TASK 2: "Work queues"- Distributing tasks among workers

For doing "Work queues"- Distributing tasks among workers, I am writing the producer code python script on the console. The code:

```
import sys
import pika

connection = pika.BlockingConnection(pika.ConnectionParameters('localhost'))
channel = connection.channel()

channel.queue_declare(queue='task_queue', durable=True)

message = ' '.join(sys.argv[1:]) or "Hello World!"
channel.basic_publish(
    exchange="",
    routing_key='task_queue',
    body=message,
    properties=pika.BasicProperties(
        delivery_mode = 2, # make message persistent
    ))
print("producer Sent %r" % message)

connection.close()
```

```
consumer.py  x  producer.py  x  producer1.py  x
1 import sys
2 import pika
3
4 connection = pika.BlockingConnection(pika.ConnectionParameters('localhost'))
5 channel = connection.channel()
6
7 channel.queue_declare(queue='task_queue', durable=True)
8
9 message = ' '.join(sys.argv[1:]) or "Hello World!"
10 channel.basic_publish(
11     exchange='',
12     routing_key='task_queue',
13     body=message,
14     properties=pika.BasicProperties(
15         delivery_mode = 2, # make message persistent
16     ))
17 print("producer Sent %r" % message)
18
19 connection.close()
```

The worker code::

```
import time
```

```
import pika
```

```
def callback(ch, method, properties, body):
```

```
    print(" worker Received %r" % body)
```

```
    time.sleep(body.count(b'.'))
```

```
    print(" worker Done")
```

```
    ch.basic_ack(delivery_tag = method.delivery_tag)
```

```
connection = pika.BlockingConnection(pika.ConnectionParameters('localhost'))
```

```
channel = connection.channel()
```

```
channel.queue_declare(queue='task_queue', durable=True)
```

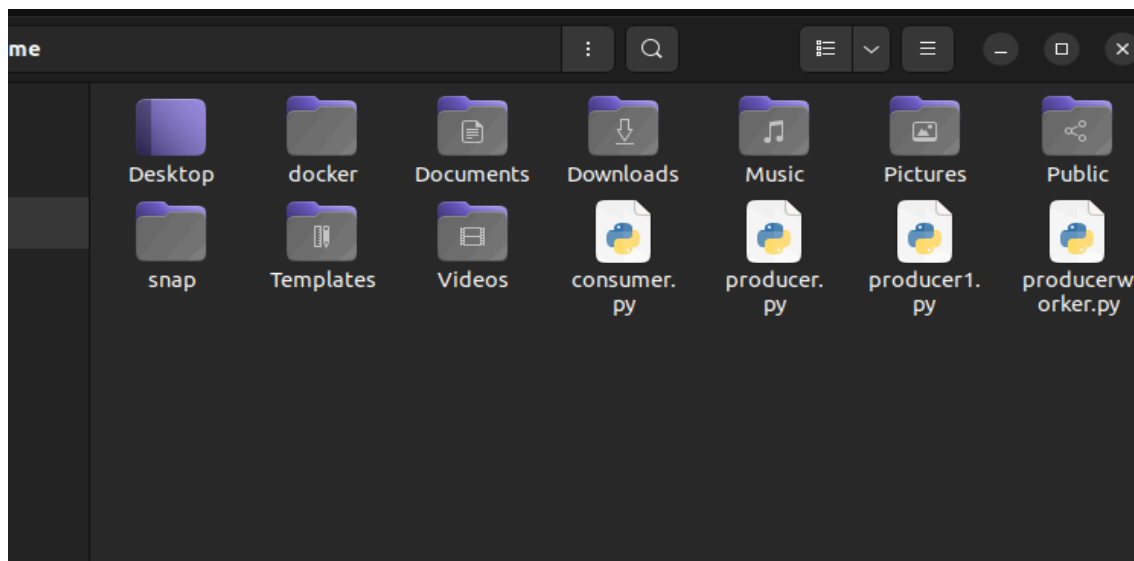
```
print('worker Waiting for messages. To exit press CTRL+C')
```

```
channel.basic_qos(prefetch_count=1)
```

```
channel.basic_consume(queue='task_queue', on_message_callback=callback)
```

```
channel.start_consuming()
```

```
producerworker.py
1 import time
2 import pika
3
4 def callback(ch, method, properties, body):
5     print(" worker Received %r" % body)
6     time.sleep(body.count(b'.'))
7     print(" worker Done")
8     ch.basic_ack(delivery_tag = method.delivery_tag)
9
10 connection = pika.BlockingConnection(pika.ConnectionParameters('localhost'))
11 channel = connection.channel()
12
13 channel.queue_declare(queue='task_queue', durable=True)
14 print('worker Waiting for messages. To exit press CTRL+C')
15
16 channel.basic_qos(prefetch_count=1)
17 channel.basic_consume(queue='task_queue', on_message_callback=callback)
18
19 channel.start_consuming()
```



Then writing the scripts:

```
mashiyat@mahjabineshita-22101878: python3 producer1.py
producer Sent 'Hello World!'
mashiyat@mahjabineshita-22101878: python3 producerworker.py
worker Waiting for messages. To exit press CTRL+C
  worker Received b'Hello World!'
  worker Done
```

Here, we can see the output so yes, this is fully working.