

```

✓ rabbitmq 12 layers [:::~::~~::~~::~~::~~::~~::~~::~~::~~:] 0B/0B    Pulled                29.3s
✓ bfbe77e41a78 Pull complete                                21.8s
✓ 3ba28653fb67 Pull complete                                25.6s
✓ 04931e0b84f1 Pull complete                                 0.6s
✓ d89b3cc0afb9 Pull complete                                 4.8s
✓ bde2259342e5 Pull complete                                 5.4s
✓ e7e3e7138b62 Pull complete                                 6.1s
✓ 6d97f8a6fe95 Pull complete                                13.0s
✓ 36fbef2a3113 Pull complete                                13.5s
✓ 99ac56c14b01 Pull complete                                14.2s
✓ 2f11352e8e93 Pull complete                                15.0s
✓ 5b66fc64ea3e Pull complete                                15.6s
✓ 3c02f0dab224 Pull complete                                27.2s
[+] Building 0.5s (9/9) FINISHED                             docker:desktop-linux
=> [app internal] load build definition from Dockerfile      0.0s
=> => transferring dockerfile: 397B                          0.0s
=> [app internal] load .dockerignore                         0.0s
=> => transferring context: 2B                                  0.0s
=> [app internal] load metadata for docker.io/library/python:3.9 0.4s
=> [app 1/4] FROM
docker.io/library/python:3.9@sha256:f2f14d6dabcbcb113512050906474d44cd 0.0s
=> [app internal] load build context                          0.0s
=> => transferring context: 986B                              0.0s
=> CACHED [app 2/4] WORKDIR /usr/src/app                    0.0s
=> CACHED [app 3/4] COPY . .                                  0.0s
=> CACHED [app 4/4] RUN pip install pika                     0.0s
=> [app] exporting to image                                   0.0s
=> => exporting layers                                         0.0s
=> => writing image
sha256:872c8661e34a8840489653877af178c6e028df6f935a4558d264b5c2d04a 0.0s
=> => naming to docker.io/library/ex1-app                    0.0s
[+] Running 3/2
✓ Network ex1_default Created                                0.0s
✓ Container ex1-rabbitmq-1 Created                           0.2s
✓ Container ex1-app-1 Created                                0.0s

```

Attaching to ex1-app-1, ex1-rabbitmq-1

`<docker exec -it ex1-app-1 /bin/bash>`

Explanation: Execs into the app to run the scripts

Output:

root@59cd947e23b2:/usr/src/app#

`<python student.py>`

Explanation: Runs *student* script

Output:

Assignment of student 1932 sent for correction

Assignment of student 1326 sent for correction

`<python demonstrator_dm.py>`

Explanation: Runs *demonstrator_dm* script

Output:

[] Demonstrator is Waiting...*

Received assignment from student 1932 with status submitted

Assignment from student 1932 sent to validation_queue

ctrlC

Explanation: Interrupts *demonstrator_dm* script

Output:

^CInterrupted

`<python demonstrator_cc.py>`

Explanation: Runs *demonstrator_cc* script

Output:

[] Demonstrator is Waiting...*

Received assignment from student 1326 with status submitted

Assignment from student 1326 sent to validation_queue

ctrlC

Explanation: Interrupts *demonstrator_cc* script

Output:

^CInterrupted

<python teaching_assistant.py>

Explanation: Runs *teaching_assistant* script

Output:

[] Teaching assistant is Waiting...*

Received assignment from student 1932 with status corrected

Assignment from student 1932 sent to result_queue

Received assignment from student 1326 with status corrected

Assignment from student 1326 sent to result_queue

ctrlC

Explanation: Interrupts *teaching_assistant* script

Output:

^CInterrupted

<python module_coordinator.py>

Explanation: Runs *module_coordinator* script

Output:

[] Module Coordinator is Waiting...*

Received assignment from student 1932 with status validated

Assignment from student 1932 published to Brightspace

Received assignment from student 1326 with status validated

Assignment from student 1326 published to Brightspace

ctrlC

Explanation: Interrupts *module_coordinator* script

ctrlC

Explanation: Interrupts *teaching_assistant* script

Output:

^CInterrupted

Exercise 2

```
<docker compose up -build>
```

Explanation: Builds the containers

[+] Running 13/13

✓ rabbitmq 12 layers [:::~::~~::~~::~~::~~::~~::~~::~~::~~::~]	OB/OB	Pulled	29.4s
✓ bfbe77e41a78 Pull complete		21.1s	
✓ 3ba28653fb67 Pull complete		25.2s	
✓ 04931e0b84f1 Pull complete		0.5s	
✓ d89b3cc0afb9 Pull complete		4.3s	
✓ bde2259342e5 Pull complete		4.8s	
✓ e7e3e7138b62 Pull complete		5.6s	
✓ 6d97f8a6fe95 Pull complete		12.5s	
✓ 36fbef2a3113 Pull complete		13.1s	
✓ 99ac56c14b01 Pull complete		13.6s	
✓ 2f11352e8e93 Pull complete		14.3s	
✓ 5b66fc64ea3e Pull complete		15.0s	
✓ 3c02f0dab224 Pull complete		19.8s	

```
[+] Building 0.5s (43/43) FINISHED                                docker:desktop-linux
=> [module_coordinator internal] load build definition from Dockerfile 0.0s
=> => transferring dockerfile: 308B                                0.0s
=> [module_coordinator internal] load .dockerignore                0.0s
=> => transferring context: 2B                                       0.0s
=> [teaching_assistant internal] load metadata for docker.io/library/pyt 0.4s
=> [demonstrator_cc internal] load build definition from Dockerfile 0.0s
=> => transferring dockerfile: 300B                                  0.0s
=> [demonstrator_cc internal] load .dockerignore                  0.0s
=> => transferring context: 2B                                       0.0s
=> [demonstrator_dm internal] load build definition from Dockerfile 0.0s
=> => transferring dockerfile: 299B                                  0.0s
=> [demonstrator_dm internal] load .dockerignore                  0.0s
=> => transferring context: 2B                                       0.0s
=> [teaching_assistant internal] load .dockerignore               0.0s
=> => transferring context: 2B                                       0.0s
=> [teaching_assistant internal] load build definition from Dockerfile 0.0s
=> => transferring dockerfile: 308B                                  0.0s
=> [student internal] load build definition from Dockerfile        0.0s
=> => transferring dockerfile: 275B                                  0.0s
=> [student internal] load .dockerignore                           0.0s
=> => transferring context: 2B                                       0.0s
=> [demonstrator_cc 1/6] FROM docker.io/library/python:3.9-slim@sha256:c 0.0s
=> [demonstrator_dm internal] load build context                  0.0s
=> => transferring context: 1.69kB                                    0.0s
=> [demonstrator_cc internal] load build context                  0.0s
=> => transferring context: 1.72kB                                    0.0s
```

```

=> [teaching_assistant internal] load build context          0.0s
=> => transferring context: 1.68kB                          0.0s
=> [module_coordinator internal] load build context          0.0s
=> => transferring context: 1.41kB                          0.0s
=> [student internal] load build context                     0.0s
=> => transferring context: 2.97kB                          0.0s
=> CACHED [student 2/6] WORKDIR /usr/src/app                0.0s
=> CACHED [demonstrator_dm 3/6] COPY ../requirements.txt /usr/src/app/ 0.0s
=> CACHED [demonstrator_dm 4/6] RUN pip install --no-cache-dir -r requir 0.0s
=> CACHED [demonstrator_dm 5/6] COPY ../rabbitmq_setup.py /usr/src/app/ 0.0s
=> CACHED [demonstrator_dm 6/6] COPY ./demonstrator_dm/demonstrator_dm.p 0.0s
=> CACHED [module_coordinator 3/6] COPY ../requirements.txt /usr/src/app 0.0s
=> CACHED [module_coordinator 4/6] RUN pip install --no-cache-dir -r req 0.0s
=> CACHED [module_coordinator 5/6] COPY ../rabbitmq_setup.py /usr/src/ap 0.0s
=> CACHED [module_coordinator 6/6] COPY ./module_coordinator/module_coor 0.0s
=> CACHED [teaching_assistant 3/6] COPY ../requirements.txt /usr/src/app 0.0s
=> CACHED [teaching_assistant 4/6] RUN pip install --no-cache-dir -r req 0.0s
=> CACHED [teaching_assistant 5/6] COPY ../rabbitmq_setup.py /usr/src/ap 0.0s
=> CACHED [teaching_assistant 6/6] COPY ./teaching_assistant/teaching_as 0.0s
=> [demonstrator_dm] exporting to image                      0.0s
=> => exporting layers                                     0.0s
=> => writing image sha256:582db7544c191fab1819559505148f2101b5f0eb112dd 0.0s
=> => naming to docker.io/library/ex2-demonstrator_dm      0.0s
=> [module_coordinator] exporting to image                  0.0s
=> => exporting layers                                     0.0s
=> => writing image sha256:4c0d124d49a5650990d07becd5e200ab88b335bb75e42 0.0s
=> => naming to docker.io/library/ex2-module_coordinator   0.0s
=> CACHED [demonstrator_cc 3/6] COPY ../requirements.txt /usr/src/app/ 0.0s
=> CACHED [demonstrator_cc 4/6] RUN pip install --no-cache-dir -r requir 0.0s
=> CACHED [demonstrator_cc 5/6] COPY ../rabbitmq_setup.py /usr/src/app/ 0.0s
=> CACHED [demonstrator_cc 6/6] COPY ./demonstrator_cc/demonstrator_cc.p 0.0s
=> CACHED [student 3/6] COPY ../requirements.txt /usr/src/app/ 0.0s
=> CACHED [student 4/6] RUN pip install --no-cache-dir -r requirements.t 0.0s
=> CACHED [student 5/6] COPY ../rabbitmq_setup.py /usr/src/app/ 0.0s
=> CACHED [student 6/6] COPY ./student/student.py . 0.0s
=> [demonstrator_cc] exporting to image                     0.0s
=> => exporting layers                                     0.0s
=> => writing image sha256:59e96e6c822b5fe3fb4cc58f122273eae666c6ad08612 0.0s
=> => naming to docker.io/library/ex2-demonstrator_cc      0.0s
=> [student] exporting to image                             0.0s
=> => exporting layers                                     0.0s
=> => writing image sha256:46cdaa1901db754cbdf9295ba4f17a4f2470e62c9f4e2 0.0s
=> => naming to docker.io/library/ex2-student             0.0s
=> [teaching_assistant] exporting to image                 0.0s
=> => exporting layers                                     0.0s
=> => writing image sha256:a78a26f489807a5ccb3860e224781ed8cb42911381400 0.0s
=> => naming to docker.io/library/ex2-teaching_assistant   0.0s

```

[+] Running 7/2

✓ Network ex2_default	Created	0.0s
✓ Container ex2-rabbitmq-1	Creat...	0.1s
✓ Container ex2-module_coordinator-1	Created	0.0s
✓ Container ex2-demonstrator_cc-1	Created	0.0s
✓ Container ex2-teaching_assistant-1	Created	0.0s
✓ Container ex2-demonstrator_dm-1	Created	0.0s
✓ Container ex2-student-1	Create...	0.0s

Attaching to ex2-demonstrator_cc-1, ex2-demonstrator_dm-1, ex2-module_coordinator-1, ex2-rabbitmq-1, ex2-student-1, ex2-teaching_assistant-1

ex2-student-1 | Waiting for RabbitMQ to start up...

ex2-rabbitmq-1 | 2023-11-28 22:25:05.399456+00:00 [notice] <0.44.0> Application syslog exited with reason: stopped

ex2-rabbitmq-1 | 2023-11-28 22:25:05.405367+00:00 [notice] <0.230.0> Logging: switching to configured handler(s); following messages may not be visible in this log output

ex2-rabbitmq-1 |

ex2-rabbitmq-1 | ## ## RabbitMQ 3.12.9

ex2-rabbitmq-1 | ## ##

ex2-rabbitmq-1 | ##### Copyright (c) 2007-2023 VMware, Inc. or its affiliates.

ex2-rabbitmq-1 | #####

ex2-rabbitmq-1 | ##### Licensed under the MPL 2.0. Website:

<https://rabbitmq.com>

ex2-rabbitmq-1 |

ex2-rabbitmq-1 | Erlang: 25.3.2.7 [jit]

ex2-rabbitmq-1 | TLS Library: OpenSSL - OpenSSL 3.1.4 24 Oct 2023

ex2-rabbitmq-1 | Release series support status: supported

ex2-rabbitmq-1 |

ex2-rabbitmq-1 | Doc guides: <https://rabbitmq.com/documentation.html>

ex2-rabbitmq-1 | Support: <https://rabbitmq.com/contact.html>

ex2-rabbitmq-1 | Tutorials: <https://rabbitmq.com/getstarted.html>

ex2-rabbitmq-1 | Monitoring: <https://rabbitmq.com/monitoring.html>

ex2-rabbitmq-1 |

ex2-rabbitmq-1 | Logs: <stdout>

ex2-rabbitmq-1 |

ex2-rabbitmq-1 | Config file(s): /etc/rabbitmq/rabbitmq.conf

ex2-rabbitmq-1 | /etc/rabbitmq/conf.d/10-defaults.conf

ex2-rabbitmq-1 |

ex2-rabbitmq-1 | Starting broker... completed with 4 plugins.

<docker attach ex2-student-1>

Explanation: Attaches the terminal to the container

Output:

docker attach ex2-student-1

Press Enter to start...

<Enter>

Explanation: Starts the process of entering assignments

Output:

Welcome to the Assignment Submission System!

Please enter the assignment details

Notes

- After attaching to the container you can add as many assignments as you like. At the end of each assignment you are asked if you would like to publish them.
- You also need to press enter to begin the process of entering assignments.
- If you enter yes (or y), all of the assignments will be published to the exchange and you will then be asked if you would like to exit the program. If you do not exit, the program will restart and you need to press enter again.
- If you enter no (or n), you will be asked to enter the details of the next assignment.

Output from my video

Terminal Output:

Press Enter to start...

Welcome to the Assignment Submission System!

Please enter the assignment details

Enter student ID: 1234

Enter the module: data_mining

Enter the content of the answer: hi

Do you want to publish all assignments? (Y/N): n

Please enter the assignment details

Enter student ID: 3456

Enter the module: data_mining

Enter the content of the answer: hello

Do you want to publish all assignments? (Y/N): n

Please enter the assignment details
Enter student ID: 5789
Enter the module: cloud_computing
Enter the content of the answer: 3452
Do you want to publish all assignments? (Y/N): y

Assignment from student 1234 for data_mining sent for correction
Assignment from student 3456 for data_mining sent for correction
Assignment from student 5789 for cloud_computing sent for correction
Start signal sent to demonstrators

Do you wish to exit the program? (Y/N): n

Welcome to the Assignment Submission System!

Please enter the assignment details
Enter student ID: 2348
Enter the module: cloud_computing
Enter the content of the answer: hii
Do you want to publish all assignments? (Y/N): n

Please enter the assignment details
Enter student ID: 9203
Enter the module: cloud_computing
Enter the content of the answer: hellooo
Do you want to publish all assignments? (Y/N): y

Assignment from student 2348 for cloud_computing sent for correction
Assignment from student 9203 for cloud_computing sent for correction
Start signal sent to demonstrators

Do you wish to exit the program? (Y/N): y
Exiting the program.

Docker logs:

ex2-student-1	Press Enter to start...
ex2-student-1	
ex2-student-1	Welcome to the Assignment Submission System!
ex2-student-1	
ex2-student-1	Please enter the assignment details


```

ex2-student-1      | Enter student ID: 1234
ex2-student-1      | Enter the module: data_mining
ex2-student-1      | Enter the content of the answer: hi
ex2-student-1      | Do you want to publish all assignments? (Y/N): n
ex2-student-1      |
ex2-student-1      |
ex2-student-1      | Please enter the assignment details
ex2-student-1      | Enter student ID: 3456
ex2-student-1      | Enter the module: data_mining
ex2-student-1      | Enter the content of the answer: hello
ex2-student-1      | Do you want to publish all assignments? (Y/N): n
ex2-student-1      |
ex2-student-1      |
ex2-student-1      | Please enter the assignment details
ex2-student-1      | Enter student ID: 5789
ex2-student-1      | Enter the module: cloud_computing
ex2-student-1      | Enter the content of the answer: 3452
ex2-student-1      | Do you want to publish all assignments? (Y/N): y
ex2-student-1      |
ex2-student-1      |
ex2-student-1      | Assignment from student 1234 for data_mining sent for correction
ex2-student-1      | Assignment from student 3456 for data_mining sent for correction
ex2-student-1      | Assignment from student 5789 for cloud_computing sent for
correction
ex2-student-1      | Start signal sent to demonstrators
ex2-student-1      |
ex2-demonstrator_dm-1 | Received start signal. Beginning to process assignments.
ex2-demonstrator_cc-1 | Received start signal. Beginning to process assignments.
ex2-demonstrator_cc-1 | [*] Cloud Computing Demonstrator is Waiting...
ex2-demonstrator_cc-1 | Received assignment from student 5789 with status submitted
ex2-demonstrator_cc-1 | Correcting assignment from student 5789 and sending back to
exchange
ex2-demonstrator_cc-1 | Assignment from student 5789 sent to validation_queue
ex2-demonstrator_dm-1 | [*] Data Mining Demonstrator is Waiting...
ex2-demonstrator_dm-1 | Received assignment from student 1234 with status submitted
ex2-demonstrator_dm-1 | Correcting assignment from student 1234 and sending back to
exchange
ex2-demonstrator_dm-1 | Assignment from student 1234 sent to validation_queue
ex2-demonstrator_dm-1 | Received assignment from student 3456 with status submitted
ex2-demonstrator_dm-1 | Correcting assignment from student 3456 and sending back to
exchange
ex2-demonstrator_dm-1 | Assignment from student 3456 sent to validation_queue
ex2-teaching_assistant-1 | Received start signal. Beginning to process assignments.
ex2-teaching_assistant-1 | [*] Teaching assistant is Waiting...
ex2-teaching_assistant-1 | Received assignment from student 5789 with status corrected

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ex2-teaching_assistant-1 | Validating assignment from student 5789 and sending back to exchange

ex2-teaching_assistant-1 | Assignment from student 5789 sent to result_queue

ex2-teaching_assistant-1 | Received assignment from student 1234 with status corrected

ex2-teaching_assistant-1 | Validating assignment from student 1234 and sending back to exchange

ex2-teaching_assistant-1 | Assignment from student 1234 sent to result_queue

ex2-teaching_assistant-1 | Received assignment from student 3456 with status corrected

ex2-teaching_assistant-1 | Validating assignment from student 3456 and sending back to exchange

ex2-teaching_assistant-1 | Assignment from student 3456 sent to result_queue

ex2-module_coordinator-1 | Received start signal. Beginning to process assignments.

ex2-module_coordinator-1 | [*] Module Coordinator is Waiting...

ex2-module_coordinator-1 | Received assignment from student 5789 with status validated

ex2-module_coordinator-1 | Publishing assignment from student 5789 to Brightspace

ex2-module_coordinator-1 | Assignment from student 5789 published to Brightspace

ex2-module_coordinator-1 | Received assignment from student 1234 with status validated

ex2-module_coordinator-1 | Publishing assignment from student 1234 to Brightspace

ex2-module_coordinator-1 | Assignment from student 1234 published to Brightspace

ex2-module_coordinator-1 | Received assignment from student 3456 with status validated

ex2-module_coordinator-1 | Publishing assignment from student 3456 to Brightspace

ex2-module_coordinator-1 | Assignment from student 3456 published to Brightspace

ex2-student-1 | Do you wish to exit the program? (Y/N): n

ex2-student-1 |

ex2-student-1 | Welcome to the Assignment Submission System!

ex2-student-1 |

ex2-student-1 | Please enter the assignment details

ex2-student-1 | Enter student ID: 2348

ex2-student-1 | Enter the module: cloud_computing

ex2-student-1 | Enter the content of the answer: hii

ex2-student-1 | Do you want to publish all assignments? (Y/N): n

ex2-student-1 |

ex2-student-1 |

ex2-student-1 |

ex2-student-1 | Please enter the assignment details

ex2-student-1 | Enter student ID: 9203

ex2-student-1 | Enter the module: cloud_computing

ex2-student-1 | Enter the content of the answer: hellooo

ex2-student-1 | Do you want to publish all assignments? (Y/N): y

ex2-student-1 |

ex2-student-1 |

ex2-student-1 | Assignment from student 2348 for cloud_computing sent for correction

ex2-student-1 | Assignment from student 9203 for cloud_computing sent for correction

ex2-demonstrator_cc-1 | Received assignment from student 2348 with status submitted

ex2-demonstrator_cc-1 | Correcting assignment from student 2348 and sending back to exchange
ex2-demonstrator_cc-1 | Assignment from student 2348 sent to validation_queue
ex2-demonstrator_cc-1 | Received assignment from student 9203 with status submitted
ex2-demonstrator_cc-1 | Correcting assignment from student 9203 and sending back to exchange
ex2-demonstrator_cc-1 | Assignment from student 9203 sent to validation_queue
ex2-teaching_assistant-1 | Received assignment from student 2348 with status corrected
ex2-teaching_assistant-1 | Validating assignment from student 2348 and sending back to exchange
ex2-teaching_assistant-1 | Assignment from student 2348 sent to result_queue
ex2-teaching_assistant-1 | Received assignment from student 9203 with status corrected
ex2-teaching_assistant-1 | Validating assignment from student 9203 and sending back to exchange
ex2-teaching_assistant-1 | Assignment from student 9203 sent to result_queue
ex2-module_coordinator-1 | Received assignment from student 2348 with status validated
ex2-module_coordinator-1 | Publishing assignment from student 2348 to Brightspace
ex2-module_coordinator-1 | Assignment from student 2348 published to Brightspace
ex2-module_coordinator-1 | Received assignment from student 9203 with status validated
ex2-module_coordinator-1 | Publishing assignment from student 9203 to Brightspace
ex2-module_coordinator-1 | Assignment from student 9203 published to Brightspace
ex2-student-1 | Start signal sent to demonstrators
ex2-student-1 |
ex2-student-1 | Do you wish to exit the program? (Y/N): y
ex2-student-1 | Exiting the program.
ex2-student-1 exited with code 0