4_Use_Qiskit_REST_API

December 23, 2025

1 Task 8.4 Qiskit Runtime Rest API

1.1 Objective 1 : Interact with the Qiskit IBM Runtime REST API

API provides * run circuits on QPU * get information asbout QPU and instances

1.1.1 Authentication

```
[ ]: curl -X POST 'https://iam.cloud.ibm.com/identity/token' \
     -H 'Content-Type: application/x-www-form-urlencoded' \
     -d 'grant_type=urn:ibm:params:oauth:grant-type:apikey&apikey=MY_APIKEY'
```

1.1.2 Submit a Job

```
[ ]: curl -X 'POST' \
       'https://quantum.cloud.ibm.com/api/v1/jobs' \
       -H 'accept: application/json' \
       -H 'Authorization: Bearer <YOUR_BEARER_TOKEN>' \
       -H 'Service-CRN: <YOUR_INSTANCE_CRN>' \
       -H 'Content-Type: application/json' \
       --data-raw '{
       "program_id": "estimator",
       "backend": "ibm_brisbane",
       "params": {
         "pubs": [[
           "OPENQASM 3.0; include \"stdgates.inc\"; bit[1] c; x $0; c[0] = measure␣
     ↪$0;", "Z"
         ]],
         "options": {"dynamical_decoupling": {"enable": true}},
         "version": 2,
         "resilience_level": 1
       }
     }'
```

1.1.3 Use a Session

```
[ ]: curl -X POST \
       'https://quantum.cloud.ibm.com/api/v1/sessions' \
       -H 'Accept: application/json' \
       -H 'Authorization: Bearer <YOUR_BEARER_TOKEN>' \
       -H 'Service-CRN: <YOUR_INSTANCE_CRN>' \
       -H 'Content-Type: application/json' \
       --data-raw '{
       "mode": "dedicated",
       "max_ttl": 28800
     }'
```

get session_id and use it in next job

```
[1]: curl -X POST \
       'https://quantum.cloud.ibm.com/api/v1/jobs' \
       -H 'Accept: application/json' \
       -H 'Authorization: Bearer <YOUR_BEARER_TOKEN>' \
       -H 'Service-CRN: <YOUR_INSTANCE_CRN>' \
       -H 'Content-Type: application/json' \
       --data-raw '{
       "program_id": "sampler",
       "backend": "ibm_brisbane",
       "session_id": "session_id1",
       "params": {
         "pubs": [[
           "OPENQASM 3.0; include \"stdgates.inc\"; bit[1] c; x $0; c[0] = measure␣
     ↪$0;"
         ]],
         "options": {},
         "version": 2
       }
     }'
```

```
    Cell In[1], line 7
       --data-raw '{
                   ^
  SyntaxError: unterminated string literal (detected at line 7)
```