

Task Overview

Objective: To evaluate the candidate's ability to handle end-to-end data engineering tasks using AWS services. The task involves uploading a file to an S3 bucket, performing ETL operations using AWS Glue, and using Lambda functions to store the processed data in an RDS PostgreSQL database.

Task Description

1. File Upload to S3 Bucket

- You will be provided with a CSV file containing raw sales data.
- Create an S3 bucket (if not already available) and upload the CSV file to this bucket.

2. ETL Process Using AWS Glue

- Create a Glue job to perform the following ETL operations on the uploaded CSV file:
 - Extract the data from the CSV file in the S3 bucket.
 - Transform the data by:
 - Removing any duplicate records.
 - Converting the date columns to a standard format (YYYY-MM-DD).
 - Aggregating the sales data to calculate total sales per product per month.
 - Load the transformed data back into a different S3 bucket or a different folder within the same bucket.

3. Lambda Function to Store Data in RDS PostgreSQL

- Set up an RDS PostgreSQL instance if not already available.
- Create a Lambda function that triggers upon completion of the Glue job.
- The Lambda function should:
 - Read the transformed data from the S3 bucket.
 - Connect to the RDS PostgreSQL database.
 - Insert the transformed data into a specific table in the database.

Detailed Steps

1. Step 1: File Upload to S3

- Create an S3 bucket named <your-unique-bucket-name>.
- Upload the provided sales_data.csv file to this bucket.

2. Step 2: AWS Glue ETL Job

- Create a new Glue job with a name like SalesDataETLJob.
- Set up the job to read from the S3 bucket and the specific file path.
- Perform the necessary transformations:
 - Remove duplicate records.
 - Convert date columns to YYYY-MM-DD format.
 - Aggregate sales data to calculate total sales per product per month.
- Write the transformed data to a new location in the S3 bucket.
- Ensure the Glue job is scheduled or triggered appropriately.

3. Step 3: AWS Lambda Function

- Create an RDS PostgreSQL instance and set up the necessary database and tables.
- Create a Lambda function named StoreTransformedData.
- The function should be triggered by the completion of the Glue job.
- The function should:
 - Read the transformed data from the S3 bucket.
 - Insert the data into the RDS PostgreSQL table.
- Ensure proper error handling and logging within the Lambda function.

Deliverables

1. Code and Configuration:

- Scripts for creating and configuring the S3 bucket, Glue job, and Lambda function.
- SQL scripts for setting up the RDS PostgreSQL database and tables.

2. Documentation:

- Detailed steps followed during the task.

- Any assumptions or decisions made during the process.
- Explanation of the transformations performed during the ETL process.

3. Verification:

- Screenshots or logs showing successful file upload to S3, Glue job execution, and data insertion into RDS PostgreSQL.
- SQL query results from the PostgreSQL database showing the inserted data.
- Share the code repository link via github
- Demo

Evaluation Criteria

- Correctness and completeness of the task.
- Efficiency and scalability of the ETL process.
- Proper use of AWS services and best practices.
- Error handling and logging mechanisms.
- Quality of documentation and code readability.

Additional Notes

- Ensure all AWS resources are properly cleaned up after the assessment to avoid incurring unnecessary costs.
- Use IAM roles and policies to securely access AWS services.
- Consider the performance implications of the ETL process and data insertion.

This task should give a comprehensive overview of the candidate's ability to work with AWS services and handle data engineering tasks efficiently.

Test Data

P007	34	14/10/2023	3295.96
P013	34	01/12/2023	2102.33
P008	93	04/05/2024	1363.84
P015	73	06/02/2024	5472.9

P007	34	14/10/2023	3295.96
P003	36	21/08/2023	2243.54
P003	62	16/06/2024	4151.57
P009	86	23/04/2024	7531.93
P020	57	07/05/2024	5387.54
P010	71	01/05/2024	1786.95
P002	42	03/01/2024	3008.69
P016	4	02/11/2023	208.5
P006	55	23/05/2024	2360.91
P002	32	28/05/2024	2591.64
P014	70	06/12/2023	811.87
P005	16	27/05/2024	1034.81
P009	40	20/05/2024	1155.74
P011	42	17/08/2023	2261.22
P010	59	19/06/2024	2573.2
P012	41	16/07/2023	3447.6
P007	4	22/05/2024	51.02
P017	12	31/10/2023	665.04
P015	57	01/11/2023	972.57
P007	23	30/03/2024	739.53
P003	50	26/07/2023	4236.33
P008	58	03/01/2024	3387.06
P013	70	31/07/2023	779.27
P001	29	03/10/2023	1461.71
P013	50	21/04/2024	1372.57

P007	34	14/10/2023	3295.96
P019	98	02/08/2023	2226.51
P019	54	24/05/2024	4472.35
P010	31	19/03/2024	824.03
P003	68	08/05/2024	6443.32
P017	70	29/03/2024	5050.55
P008	80	05/04/2024	5769.03
P004	18	19/04/2024	1250.24
P003	10	11/07/2023	188.74
P017	63	25/09/2023	4333.78
P019	91	24/10/2023	1921.27
P003	70	09/11/2023	2506.02
P004	96	24/10/2023	1948.58
P014	2	17/09/2023	122.72
P002	25	11/05/2024	924.28
P020	4	03/02/2024	238.69
P008	19	17/06/2024	228.82
P007	16	25/03/2024	973.76
P012	66	30/03/2024	3179.61
P006	10	11/07/2023	274.84
P007	11	31/05/2024	232.35
P016	75	28/02/2024	2551.16
P005	89	07/01/2024	1363.66
P005	87	13/06/2024	8427.58
P007	38	01/08/2023	2310.31

P007	34	14/10/2023	3295.96
P006	64	20/06/2024	5299.53
P017	42	08/01/2024	2469.28
P012	43	05/02/2024	1343.65
P013	87	17/11/2023	7096.79
P010	36	11/08/2023	598.15
P003	24	15/12/2023	1282.69
P013	31	02/08/2023	1734.19
P019	39	21/06/2024	3496.81
P005	14	18/06/2024	1015.37
P002	98	12/11/2023	5612.2
P011	14	15/04/2024	454.24
P009	92	30/08/2023	7647.14
P015	12	10/02/2024	663.9
P007	95	20/05/2024	1248.73
P007	29	22/06/2024	2272.02
P001	4	26/04/2024	186.67
P008	26	23/08/2023	1291.08
P019	57	26/03/2024	4279.58
P002	73	12/10/2023	3281.31
P019	72	19/01/2024	5830.02
P009	39	31/07/2023	2917.47
P016	9	22/06/2024	397.88
P010	82	02/03/2024	7107.62
P011	55	29/01/2024	4210.61

P007	34	14/10/2023	3295.96
P003	9	24/07/2023	655.96
P013	44	22/08/2023	1282.43
P019	89	10/05/2024	6792.03
P018	13	24/03/2024	578.49
P017	48	02/02/2024	4338.09
P007	75	27/01/2024	2770.24
P018	17	02/12/2023	332.84
P008	73	24/08/2023	768.1
P002	73	10/06/2024	1511.63
P010	19	30/09/2023	1217.42
P016	50	25/04/2024	1991.76
P016	55	26/04/2024	2958.69
P008	66	08/01/2024	3313.92
P001	43	02/06/2024	1714.03
P013	38	24/10/2023	2398.97
P003	48	30/11/2023	1965.87
P008	82	21/02/2024	6604.02
P007	71	21/04/2024	727.09
P017	68	13/12/2023	5760.01
P008	38	07/04/2024	783.9
P010	18	06/05/2024	1133.82
P006	44	01/03/2024	2489.93
P004	21	10/07/2023	1110.96
P009	4	16/06/2024	318.88

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P015	68	07/03/2024	3200.26
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P007	13	30/11/2023	266.64
P005	7	15/02/2024	583.44
P012	93	25/10/2023	2475.67
P014	34	17/03/2024	358.32
P011	67	26/05/2024	5276.18
P013	41	08/01/2024	3463.02
P010	87	19/06/2024	4382.69
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P004	30	01/08/2023	476.76
P009	99	27/05/2024	5294.91
P007	56	31/01/2024	651.2
P004	76	01/05/2024	6501.77
P017	63	02/12/2023	4732.73
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P019	39	07/05/2024	3563.6
P001	29	29/07/2023	2636.11
P012	27	30/01/2024	1545.85
P015	91	16/01/2024	2188.49
P014	71	05/12/2023	4565.88
P007	44	30/03/2024	2602.51
P010	88	13/04/2024	5637.89
P019	61	31/08/2023	5568.7
P009	18	02/07/2023	1703.92
P012	17	10/08/2023	763.74
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P013	58	23/11/2023	5068.77
P005	22	27/02/2024	453.03
P010	29	14/10/2023	1689.73
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P011	32	13/09/2023	2994.03
P007	43	15/04/2024	2861.81
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P019	75	17/09/2023	1528.82
P017	40	13/05/2024	3564.77
P005	86	07/04/2024	7292.44
P003	32	11/05/2024	2636.44
P007	1	07/12/2023	43.23
P001	78	29/04/2024	4615.88
P015	77	02/11/2023	3887.88
P009	42	09/05/2024	1813.08
P014	74	06/02/2024	5637.1
P008	4	14/09/2023	175.93
P003	20	06/07/2023	1398.06
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P012	32	13/04/2024	2390.79
P001	95	22/06/2024	4437.99
P001	62	04/06/2024	2577.74
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P009	82	07/06/2024	8113.74
P010	91	06/11/2023	5904.77
P018	4	07/04/2024	207.89
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P007	34	14/10/2023	3295.96
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P010	4	07/06/2024	234.74
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P016	1	05/03/2024	36.12
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P005	61	01/04/2024	3907.31
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P017	60	13/12/2023	1336.28
P006	4	21/05/2024	299.74
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P020	31	18/12/2023	695.6
P020	50	15/04/2024	2774.24
P010	82	16/11/2023	1031.59
P013	74	07/01/2024	7298.03
P006	71	03/03/2024	3394.59
P009	93	09/07/2023	6375.8
P015	36	27/07/2023	2324.31
P020	7	20/12/2023	441.49
P015	36	09/10/2023	2065.35
P009	43	21/04/2024	2454.32
P017	42	19/02/2024	4045.04

P007	34	14/10/2023	3295.96
P010	9	13/12/2023	555.22
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P016	37	21/11/2023	3247.41
P003	32	08/08/2023	352.36
P004	58	17/10/2023	4583.31
P003	20	02/07/2023	1449.37
P014	1	01/03/2024	59.99
P002	45	15/10/2023	1237.33
P004	21	01/04/2024	828.59
P007	4	01/06/2024	103.99
P012	54	29/04/2024	4272.89
P001	47	18/12/2023	3127.94
P017	80	29/04/2024	1571.7
P014	46	19/04/2024	4108.25
P002	29	05/06/2024	355.87
P015	96	03/02/2024	3970.15
P005	32	13/06/2024	628.9
P008	41	27/08/2023	2359.67
P013	76	15/06/2024	1278.74
P017	47	01/12/2023	2055.11
P020	15	01/10/2023	1214.26
P002	81	13/06/2024	2093.72
P003	57	27/09/2023	2327.83
P011	92	07/10/2023	8866.45

P007	34	14/10/2023	3295.96
P012	22	08/07/2023	159.6
P019	43	27/03/2024	3118.9
P020	28	04/10/2023	2564.96
P002	95	29/04/2024	7184.92
P016	34	17/05/2024	1664.8
P018	59	31/08/2023	3889.23
P002	23	03/01/2024	274.56
P007	69	08/08/2023	6676.68
P012	96	10/09/2023	6070.36
P013	89	10/07/2023	2698.08
P020	87	09/03/2024	2574.52
P020	94	13/09/2023	7710.1
P011	56	30/04/2024	4149.79
P012	29	04/02/2024	2012.68
P018	19	20/01/2024	482.5
P006	39	05/12/2023	2448.26
P007	16	24/10/2023	1030.57
P014	7	17/12/2023	355.93
P015	12	28/04/2024	171.83
P008	51	17/12/2023	741.68
P014	13	15/10/2023	912.22
P002	62	13/02/2024	1878.65
P010	20	21/05/2024	251.45
P014	45	03/07/2023	4354.89

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P012	6	17/11/2023	150.16
P011	11	22/05/2024	349.78
P009	6	19/07/2023	65.6
P006	61	06/08/2023	2303.14
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P011	21	20/04/2024	673.13
P020	66	20/07/2023	3900.18
P015	60	18/07/2023	4667.03
P007	52	20/06/2024	1792.41
P006	3	29/07/2023	114.47
P008	100	16/02/2024	5060.07
P001	55	14/12/2023	3043.7
P001	99	05/04/2024	2198.47
P004	23	27/08/2023	241.94
P010	80	10/08/2023	3279.15
P009	29	11/01/2024	1937.1
P015	91	27/07/2023	6544.06
P013	7	24/12/2023	316.39
P003	94	17/02/2024	4515.84
P019	82	21/01/2024	7381.14
P006	25	30/08/2023	1381.46
P016	19	29/04/2024	462.1
P013	5	15/11/2023	336.14
P002	49	11/04/2024	691.39

P007	34	14/10/2023	3295.96
P015	64	02/10/2023	4244.9
P006	75	21/03/2024	5137.09
P014	7	20/11/2023	220.75
P009	3	16/11/2023	187.74
P018	7	30/10/2023	525.57
P011	17	15/11/2023	1618.93
P006	97	29/10/2023	6762.97
P019	68	26/04/2024	5137
P001	57	28/10/2023	3276.86
P018	51	03/07/2023	1001.05
P006	67	11/05/2024	1056.4
P019	15	06/06/2024	1280.29
P019	40	07/10/2023	3187.17
P017	95	03/02/2024	7303.95
P005	24	09/12/2023	2387.21
P013	5	31/01/2024	243.11
P018	98	15/08/2023	5600.39
P012	73	20/05/2024	2654.59
P016	23	15/06/2024	1721.28
P011	49	08/02/2024	4436.62
P015	83	13/02/2024	2988.83
P018	33	13/11/2023	1548.17
P020	42	01/12/2023	4094.93
P007	15	26/06/2024	177.46

P007	34	14/10/2023	3295.96
P012	92	01/03/2024	8597.92
P003	55	24/11/2023	4027.24
P006	83	09/01/2024	6711.46
P010	9	20/12/2023	637.67
P016	71	09/11/2023	6346.16
P009	45	28/02/2024	4459.87
P020	59	31/07/2023	636.24
P013	18	31/12/2023	946.05
P020	80	04/02/2024	6896.86
P005	42	12/06/2024	1280.75
P017	98	10/10/2023	1351.26
P003	100	25/08/2023	1467.74
P002	25	02/09/2023	1573.7
P001	42	26/08/2023	2534.9
P006	25	09/09/2023	1550.15
P002	72	23/11/2023	1908.94
P007	86	07/05/2024	3779.23
P008	74	23/03/2024	7353.36
P002	72	15/01/2024	5703.68
P014	96	14/03/2024	6984.79
P017	38	03/02/2024	1391.5
P004	42	22/02/2024	3717.04
P020	60	19/04/2024	2691.18
P017	98	20/10/2023	9370.14

P007	34	14/10/2023	3295.96
P010	65	11/10/2023	5150.16
P005	93	07/03/2024	7036.02
P017	99	26/01/2024	6171.03
P006	16	17/01/2024	1527.81
P011	89	13/03/2024	3960.45
P016	6	18/01/2024	477.46
P012	29	09/11/2023	451.11
P007	64	16/09/2023	2087.13
P013	79	14/07/2023	945.66
P011	58	12/10/2023	2158.03
P004	45	26/09/2023	2428.47
P005	45	26/12/2023	1481.21
P011	64	06/07/2023	3904.03
P006	97	15/08/2023	1054.59
P015	55	24/10/2023	5440.23
P012	28	04/01/2024	744.34
P016	85	09/10/2023	2584.05
P013	57	09/08/2023	2603.57
P014	70	23/09/2023	1730.32
P012	67	27/02/2024	743.53
P001	44	03/08/2023	937.57
P012	20	03/11/2023	1119.14
P001	38	24/10/2023	2291.27
P001	60	30/08/2023	1139.71

P007	34	14/10/2023	3295.96
P004	3	29/12/2023	260.85
P006	67	18/12/2023	2439.33
P008	2	22/12/2023	169
P007	91	26/01/2024	3756.45
P005	61	03/02/2024	5310.91
P015	38	31/08/2023	2866.31
P016	10	11/10/2023	106.79
P007	96	06/02/2024	3603.66
P004	93	02/11/2023	8043.53
P007	97	10/08/2023	7950.52
P003	50	14/01/2024	3067.47
P009	16	13/11/2023	728.83
P004	77	28/12/2023	1810.71
P005	70	28/10/2023	1449.14
P013	9	18/10/2023	753.92
P011	42	20/07/2023	1618.57
P011	43	28/03/2024	2669.25
P017	100	10/12/2023	5339.48
P001	50	03/04/2024	2934.29
P015	90	03/11/2023	4853.39
P013	18	23/01/2024	237.15
P001	89	27/08/2023	1487.71
P016	12	06/03/2024	289.95
P001	4	04/09/2023	261.88

P007	34	14/10/2023	3295.96
P015	58	18/03/2024	2245.02
P014	97	19/07/2023	5753.09
P013	23	11/12/2023	1855.87
P016	69	27/02/2024	1988.23
P016	62	05/01/2024	5063.29
P018	18	13/03/2024	939.19
P019	34	23/07/2023	984.94
P007	18	28/01/2024	1215.29
P006	58	29/12/2023	1481.39
P020	58	13/01/2024	5197.27
P003	99	01/09/2023	9303.44
P014	45	06/10/2023	838.48
P001	21	19/04/2024	1633.92
P020	78	14/03/2024	5030.05
P007	17	03/12/2023	1574.31
P002	19	25/07/2023	326.53
P006	20	15/03/2024	501.88
P011	20	04/04/2024	1517.07
P010	88	13/05/2024	2639.25
P008	84	08/06/2024	6481.84
P005	91	30/10/2023	2678.07
P015	98	21/10/2023	8331.87
P014	10	17/07/2023	265.35
P002	15	20/04/2024	533.46

P007	34	14/10/2023	3295.96
P017	14	03/07/2023	1111.3
P014	67	17/09/2023	926.71
P020	35	13/09/2023	2012.09
P014	44	01/01/2024	1029.15
P004	76	10/10/2023	2213.48
P002	21	04/02/2024	1903.82
P011	8	14/06/2024	631.79
P005	39	05/11/2023	1455.76
P013	59	03/11/2023	5269.37
P002	9	17/03/2024	346.65
P004	75	15/09/2023	5112.44
P001	19	23/10/2023	1307.44
P012	29	15/10/2023	2760.23
P014	97	31/03/2024	5327.41
P010	29	06/03/2024	2226.63
P009	27	29/11/2023	2246.67
P009	80	10/08/2023	6779.79
P008	45	02/04/2024	2039.25
P018	34	30/01/2024	1471.29
P007	61	22/04/2024	1155.35
P016	3	31/08/2023	113.07
P004	41	30/10/2023	1739.92
P014	7	06/03/2024	648.58
P014	74	07/08/2023	1742.94

P007	34	14/10/2023	3295.96
P001	67	30/03/2024	1436.25
P020	64	23/09/2023	3801.8
P019	49	24/01/2024	3837.82
P011	73	03/04/2024	3537.52
P018	63	30/10/2023	1669.66
P006	68	10/09/2023	954.06
P002	82	03/06/2024	7804.15
P013	9	07/12/2023	725.67
P020	86	29/04/2024	2998.47
P014	42	09/10/2023	3546.52
P018	89	13/06/2024	3352.23
P011	68	22/11/2023	1507.59
P020	28	10/12/2023	443.82
P016	14	09/09/2023	248.64
P020	35	07/06/2024	2320.83
P011	70	01/05/2024	5720.11
P002	48	08/05/2024	2887.6
P006	83	03/09/2023	4200.08
P016	5	27/08/2023	321.16
P001	44	18/07/2023	710.84
P016	95	14/05/2024	7131.34
P020	42	22/10/2023	1159.24
P008	36	18/02/2024	1798.56
P014	92	01/02/2024	5495

P007	34	14/10/2023	3295.96
P014	37	13/07/2023	1709.9
P017	82	04/07/2023	1361.7
P008	73	06/09/2023	4147.49
P009	6	27/07/2023	346.34
P001	87	16/03/2024	1999.77
P009	66	13/08/2023	966.79
P004	19	13/07/2023	1058.6
P001	22	11/02/2024	669.29
P004	84	07/12/2023	4712.78
P003	76	05/07/2023	3188.52
P005	44	01/08/2023	1540.7
P017	56	17/09/2023	4226.07
P018	87	21/10/2023	4278.6
P017	36	18/09/2023	1076.32
P004	62	12/09/2023	4373.52
P013	64	23/03/2024	2136.42
P014	100	23/06/2024	1158.62
P006	61	09/01/2024	5365.03
P015	73	12/03/2024	4802.16
P019	13	21/10/2023	815.97
P016	37	25/12/2023	3685.38
P011	61	28/02/2024	4904.39
P007	93	29/03/2024	1674.34
P012	42	08/07/2023	2538.68

P007	34	14/10/2023	3295.96
P004	99	14/05/2024	5811.74
P018	80	09/11/2023	5950.78
P017	28	13/09/2023	2039.49
P011	41	24/10/2023	3629.83
P011	14	25/08/2023	1118.72
P006	68	13/05/2024	6719.67
P015	85	28/11/2023	6160.8
P014	45	17/07/2023	960.17
P020	29	05/01/2024	2663.23
P001	30	23/12/2023	1355.5
P006	35	25/06/2024	2533.54
P017	66	13/07/2023	846.19
P006	35	24/11/2023	1323.47
P013	34	04/10/2023	1265.51
P001	65	27/03/2024	6293.74
P012	95	16/10/2023	5241.35
P020	84	02/10/2023	7959.25
P015	22	18/12/2023	682.85
P018	43	07/01/2024	1453.26
P016	13	06/11/2023	427.1
P006	49	04/01/2024	4119.23
P020	59	17/12/2023	5505.37
P017	50	27/12/2023	2769.21
P003	52	04/02/2024	1052.51

P007	34	14/10/2023	3295.96
P019	81	02/10/2023	7078.68
P017	83	28/05/2024	2098.11
P009	94	04/08/2023	4548.53
P008	31	22/05/2024	2130.34
P005	76	02/08/2023	3706.32
P002	82	24/07/2023	3380.13
P004	49	23/10/2023	4120.35
P014	82	13/12/2023	6006.29
P004	27	09/04/2024	715.95
P011	6	11/02/2024	233.35
P013	67	03/06/2024	2700.31
P009	15	28/10/2023	1046.06
P019	6	20/11/2023	200.06
P007	8	01/07/2023	224.65
P012	70	08/02/2024	6960.27
P009	33	31/01/2024	719.59
P013	2	12/06/2024	49.31
P019	75	10/07/2023	2303.74
P018	26	07/06/2024	1548.38
P003	65	05/07/2023	5417.71
P002	66	27/05/2024	5266.96
P020	50	27/06/2024	4926.51
P012	17	26/08/2023	891.37
P010	21	07/08/2023	1828.12

P007	34	14/10/2023	3295.96
P009	66	14/06/2024	1750.2
P016	87	21/11/2023	3643.88
P009	90	21/08/2023	3208.5
P018	34	18/02/2024	1044.33
P006	10	15/09/2023	258.6
P020	12	28/06/2024	1002.01
P013	33	19/03/2024	1553.95
P006	75	20/06/2024	6564.33
P004	54	01/12/2023	4249.49
P006	51	29/06/2023	1130.76
P008	18	26/10/2023	1450.81
P020	36	05/05/2024	2060.55
P014	86	21/09/2023	6536.09
P004	58	22/04/2024	4184.43
P010	64	22/04/2024	1303.96
P009	33	12/01/2024	666.71
P018	42	28/07/2023	3685.12
P012	47	13/04/2024	2501.92
P016	62	27/01/2024	2940.18
P005	56	23/05/2024	1010.61
P012	10	03/10/2023	738.11
P003	59	20/01/2024	1131.79
P013	87	20/01/2024	1757.36
P002	50	08/05/2024	1732.78

P007	34	14/10/2023	3295.96
P007	90	30/03/2024	6208.75
P019	63	15/03/2024	1836.85
P017	64	18/09/2023	2798.07
P013	50	25/12/2023	2550.43
P018	95	27/03/2024	2251.5
P004	85	30/03/2024	3749.29
P007	95	26/04/2024	5168.36
P004	78	23/02/2024	4775.53
P009	79	10/06/2024	1034.23
P018	14	19/01/2024	351.97
P008	82	10/05/2024	6420.56
P010	10	04/01/2024	586.46
P007	1	28/04/2024	35.45
P015	91	28/04/2024	2973.54
P015	42	22/11/2023	1441.89
P018	93	19/12/2023	8133.83
P014	75	15/10/2023	5614.49
P002	90	14/04/2024	3214.62
P010	33	16/05/2024	770.05
P008	12	19/11/2023	414.22
P005	42	17/03/2024	1683.7
P015	4	04/03/2024	376.77
P014	49	11/01/2024	544.82
P012	70	29/06/2023	1954.19

P007	34	14/10/2023	3295.96
P005	59	24/08/2023	2832.25
P004	45	20/07/2023	132.41
P009	61	24/07/2023	1685.15
P011	80	28/05/2024	1917.79
P018	1	28/06/2024	71.75
P020	71	02/11/2023	1340.31
P011	13	09/08/2023	965.12
P007	76	02/10/2023	2512.14
P007	10	07/09/2023	361.63
P001	61	22/03/2024	2839.19
P016	35	22/10/2023	3414.78
P018	30	23/01/2024	1293.86
P010	1	31/03/2024	90.51
P017	90	16/09/2023	8912.09
P014	11	21/09/2023	1035.36
P014	67	08/05/2024	2419.33
P004	95	11/01/2024	4715.46
P009	77	03/04/2024	7686.82
P005	10	23/12/2023	747.49
P006	99	19/10/2023	1295.21
P014	27	26/10/2023	2500.37
P009	2	15/08/2023	160.53
P017	22	27/09/2023	229.37
P017	69	28/05/2024	5253.55

P007	34	14/10/2023	3295.96
P015	93	07/11/2023	7288.27
P016	24	10/01/2024	1488.8
P013	66	14/10/2023	1745.6
P020	99	26/11/2023	5413.6
P011	19	11/11/2023	636.56
P012	7	06/03/2024	248.98
P011	90	02/09/2023	5342.74
P012	85	05/11/2023	4522.18
P020	16	14/04/2024	720
P016	99	12/10/2023	4840.02
P012	35	15/10/2023	1870.04
P015	11	03/03/2024	420.4
P017	1	19/08/2023	88.98
P016	92	03/09/2023	2727.56
P009	29	24/10/2023	2087.24
P016	43	02/07/2023	3653.81
P011	70	29/04/2024	875.53
P001	33	24/03/2024	1814.02
P004	40	01/12/2023	2650.93
P004	32	02/12/2023	1471.44
P011	13	15/10/2023	542.16
P017	68	07/08/2023	2820.8
P008	7	22/02/2024	180.43
P011	55	17/07/2023	4810.12

P007	34	14/10/2023	3295.96
P010	72	19/12/2023	6564.66
P015	41	07/05/2024	1103.43
P010	23	14/01/2024	785.73
P003	51	10/07/2023	1173.44
P007	87	12/04/2024	8573.66
P003	30	11/08/2023	2212.28
P002	2	16/04/2024	83.91
P012	74	04/04/2024	1263.89
P004	3	04/06/2024	292.09
P013	79	09/01/2024	7757.3
P004	46	24/07/2023	1043.78
P014	80	26/10/2023	1474.03
P001	75	14/03/2024	1197.67
P006	22	22/03/2024	1379.39
P016	10	29/01/2024	699.1
P019	78	06/10/2023	6243.75
P003	68	20/03/2024	5760.3
P019	99	10/06/2024	9281.38
P005	13	09/12/2023	624.7
P001	51	24/01/2024	934.23
P008	40	21/12/2023	1259.97
P020	98	14/03/2024	6068.94
P005	2	24/10/2023	41.93
P012	58	04/12/2023	5634.47

P007	34	14/10/2023	3295.96
P009	36	04/06/2024	3510.19
P011	66	13/12/2023	3622.21
P015	98	10/01/2024	8069.25
P013	98	09/06/2024	2433.38
P015	20	21/11/2023	1664.7
P006	93	14/10/2023	1486.19
P010	51	17/10/2023	579.51
P007	90	24/10/2023	2730.72
P007	61	30/03/2024	1894.39
P019	95	24/03/2024	4536.83
P002	64	27/03/2024	3771.76
P015	36	19/04/2024	2758.47
P002	33	17/12/2023	2626.25
P011	75	03/12/2023	4158.93
P014	90	30/10/2023	1077.87
P009	73	17/07/2023	4521.28
P013	38	19/02/2024	3762.09
P007	74	08/07/2023	765.59
P015	49	19/06/2024	1610.03
P005	59	10/10/2023	2866.71
P003	39	24/04/2024	2808.53
P012	30	11/07/2023	2846.33
P001	14	21/12/2023	984.45
P003	12	02/11/2023	267.31

P007	34	14/10/2023	3295.96
P001	37	03/02/2024	2318.84
P010	3	22/02/2024	40.95
P018	28	05/05/2024	1464.77
P004	12	10/09/2023	912.23
P010	26	13/02/2024	1175.45
P019	52	10/01/2024	1932.19
P019	78	30/08/2023	6300.53
P013	24	15/08/2023	1117.05
P006	70	07/02/2024	4910.04
P006	61	09/12/2023	4762.24
P016	41	07/04/2024	561.75
P013	63	04/11/2023	789.57
P011	72	01/12/2023	1431.97
P005	30	07/05/2024	1446.17
P006	69	14/11/2023	3691.91
P014	64	13/08/2023	4426.89
P009	66	04/05/2024	5179.55
P006	44	10/07/2023	2346.64
P005	93	05/09/2023	8646.03
P017	87	17/03/2024	3492.47
P020	13	25/12/2023	471.65
P001	91	25/04/2024	2385.92
P014	47	08/02/2024	4229.87
P018	97	25/11/2023	6613.39

P007	34	14/10/2023	3295.96
P013	47	05/01/2024	874.47
P016	77	14/03/2024	3242.97
P013	5	23/07/2023	79.59
P005	50	18/12/2023	3247.47
P004	24	16/05/2024	665.89
P018	80	18/12/2023	4095.33
P013	18	29/02/2024	512.9
P002	63	15/07/2023	5203.77
P006	49	27/04/2024	1928.22
P016	53	17/03/2024	3888.28
P006	25	14/04/2024	634.97
P014	62	24/11/2023	1438.79
P016	17	05/12/2023	1071.77
P017	76	25/05/2024	1517.88
P020	78	13/01/2024	2337.45
P014	74	03/06/2024	1847.66
P003	15	13/07/2023	1472.71
P011	100	17/12/2023	5427.8
P001	38	09/09/2023	397.82
P001	7	24/12/2023	288.57
P002	89	14/11/2023	1048.88
P017	8	21/12/2023	630.25
P020	59	29/01/2024	2890.76
P020	2	21/12/2023	69.29

P007	34	14/10/2023	3295.96
P018	17	17/08/2023	639.42
P019	14	11/07/2023	772.42
P004	68	07/02/2024	4789.9
P019	21	16/03/2024	1629.79
P009	77	06/04/2024	1180.62
P006	27	26/06/2024	1410.44
P017	65	24/10/2023	2804.16
P012	52	06/07/2023	766.32
P005	1	05/01/2024	91.72
P010	72	28/06/2024	5314.42
P016	25	12/12/2023	1870.36
P008	28	28/07/2023	2710.92
P002	58	12/08/2023	609.22
P011	7	30/03/2024	251.78
P014	7	29/11/2023	485.14
P013	65	06/09/2023	5433.34
P001	39	18/11/2023	1659.74
P009	81	05/03/2024	7672.24
P003	18	15/05/2024	1213.9
P020	25	01/09/2023	2386.92
P011	88	13/04/2024	1759.94
P009	67	29/06/2023	1665.29
P010	20	05/11/2023	1137.38
P011	98	16/04/2024	9422.6

P007	34	14/10/2023	3295.96
P010	69	07/10/2023	3278.43
P013	87	27/12/2023	2273.75
P005	10	05/04/2024	759.63
P014	56	13/11/2023	4311.25
P015	4	19/12/2023	150.96
P017	96	04/06/2024	1056.6
P014	19	22/04/2024	668.33
P002	27	16/05/2024	417.42
P008	50	04/01/2024	1119.35
P004	79	21/12/2023	3197.78
P001	91	25/06/2024	7101.58
P002	60	14/10/2023	1689.94
P019	6	14/06/2024	73.35
P017	40	02/09/2023	2117.5
P020	58	13/12/2023	4432.83
P020	15	03/07/2023	1016.9
P010	59	10/10/2023	5629.23
P010	76	20/05/2024	6038.89
P001	81	07/07/2023	3755.86
P014	45	13/12/2023	2925.84
P018	67	10/05/2024	2199.75
P011	87	28/01/2024	6050.78
P020	44	19/02/2024	3158.23
P017	6	18/12/2023	215.67

P007	34	14/10/2023	3295.96
P009	37	10/02/2024	455.26
P019	99	12/09/2023	3986.01
P001	73	07/06/2024	4128.31
P018	17	26/09/2023	1006.79
P007	51	11/06/2024	5006.68
P001	13	20/06/2024	1247.11
P001	5	05/06/2024	63.31
P019	44	29/11/2023	3499.02
P001	11	02/09/2023	964.35
P020	57	31/03/2024	2606.5
P014	8	14/06/2024	664.5
P015	52	02/12/2023	1096.53
P003	58	06/07/2023	3161.9
P002	68	24/11/2023	3559.88
P015	87	15/01/2024	8454.86
P005	41	18/04/2024	1317.13
P020	22	07/01/2024	2181.32
P011	50	12/11/2023	994.17
P005	43	13/10/2023	3701.62
P016	55	08/09/2023	2592.03
P002	57	21/06/2024	5245.95
P012	92	20/10/2023	8514.13
P014	98	14/03/2024	7295.6
P008	66	04/09/2023	1527.2

P007	34	14/10/2023	3295.96
P014	9	08/09/2023	643.32
P007	63	30/09/2023	5644.64
P013	13	15/12/2023	1131.91
P008	14	03/04/2024	719.92
P011	84	26/07/2023	6049.69
P017	34	02/01/2024	1634.47
P017	74	06/09/2023	6083.62
P013	42	27/12/2023	3263.13
P010	35	27/02/2024	2041.82
P014	35	05/01/2024	3451.15
P003	10	12/07/2023	164.24
P004	5	16/01/2024	182.59
P003	30	31/03/2024	1830.18
P009	88	19/03/2024	4266.2
P010	55	27/03/2024	1167.93
P008	66	08/10/2023	4367.81
P013	72	02/01/2024	6705.5
P013	91	29/03/2024	3607.03
P007	91	26/03/2024	5044.7
P007	7	15/08/2023	341.11
P003	11	14/04/2024	149.47
P010	97	15/11/2023	5872.6
P012	91	04/04/2024	6460.31
P020	54	03/07/2023	2525.08

P007	34	14/10/2023	3295.96
P002	9	16/05/2024	585.06
P019	32	22/09/2023	2065.72
P016	36	06/04/2024	999.19
P002	10	26/01/2024	173.37
P016	68	20/02/2024	3466.72
P012	81	08/08/2023	3919.67
P011	43	04/12/2023	3854.01
P019	86	28/10/2023	4182.27
P016	76	21/08/2023	1802.47
P010	93	07/09/2023	3628.92
P008	5	26/08/2023	426.49
P004	59	25/11/2023	2671.35
P016	18	18/10/2023	817.04
P010	8	03/03/2024	234.8
P019	35	17/04/2024	1805.14
P018	13	08/07/2023	399.01
P019	100	06/07/2023	5047.16
P020	82	08/07/2023	2749.99
P005	8	15/05/2024	163.82
P016	66	19/01/2024	915.28
P017	14	30/09/2023	207.88
P006	10	28/08/2023	860.26
P018	63	17/05/2024	815.42
P004	74	12/12/2023	1518.37

P007	34	14/10/2023	3295.96
P017	80	16/02/2024	4357.61
P013	7	24/01/2024	221.18
P010	4	16/01/2024	174.77
P019	66	26/02/2024	2835.18
P005	64	24/11/2023	5685.54
P004	84	27/02/2024	1585.8
P014	33	16/05/2024	1369.95
P019	38	28/07/2023	3434.83
P015	26	28/02/2024	670.48
P020	71	09/02/2024	1171.52
P001	45	28/03/2024	1985.88
P015	38	04/06/2024	3502.59
P008	61	20/09/2023	5966.72
P015	69	18/07/2023	3822.9
P017	34	28/09/2023	1013.98
P015	100	12/04/2024	6157.13
P009	3	27/10/2023	171.7
P007	10	18/04/2024	980.49
P014	82	14/04/2024	2850.94
P002	78	24/04/2024	6634.12
P007	54	26/03/2024	2788.57
P004	98	02/04/2024	9452.06
P019	36	16/05/2024	3367.13
P016	62	25/08/2023	5672.56

P007	34	14/10/2023	3295.96
P001	46	12/05/2024	2366.24
P017	73	28/12/2023	3726.72
P017	73	16/04/2024	5472.99
P018	12	01/01/2024	265.89
P011	95	16/01/2024	7000.22
P004	53	06/11/2023	4430.1
P001	22	15/08/2023	1632.75
P007	64	25/08/2023	2966.56
P020	25	09/05/2024	719.11
P017	72	18/11/2023	4273.96
P016	18	23/09/2023	604.8
P018	67	07/12/2023	4450.4
P019	21	01/02/2024	382.1
P012	56	12/02/2024	2203.31
P012	1	01/06/2024	33.08
P012	48	11/01/2024	2988.81
P011	25	27/06/2024	1619.91
P014	52	13/06/2024	1480.54
P008	90	21/07/2023	6596.36
P019	59	08/05/2024	3095.18
P019	2	29/01/2024	42.79
P010	58	27/07/2023	4228.93
P010	13	10/11/2023	246.81
P011	57	12/11/2023	3189.65

P007	34	14/10/2023	3295.96
P012	27	01/06/2024	1692.63
P019	52	14/12/2023	3916.51
P016	38	16/02/2024	2860.88
P005	14	24/05/2024	173.23
P002	84	21/12/2023	4708.32
P011	56	05/12/2023	3614.94
P005	19	22/01/2024	1757.27
P010	45	07/05/2024	725.6
P009	96	01/07/2023	1558.37
P002	1	10/05/2024	48.56
P001	76	18/11/2023	4592.57
P007	89	06/02/2024	2537.7
P006	44	06/02/2024	1808.72
P001	66	28/04/2024	6563.83
P014	34	07/12/2023	887.31
P008	54	08/10/2023	1074.15
P003	25	12/08/2023	1054.83
P008	25	29/11/2023	346.18
P003	30	23/10/2023	2985.69
P014	48	31/07/2023	2145.6
P007	95	02/07/2023	5130.61
P004	26	01/05/2024	2289.36
P018	59	30/11/2023	5015.95
P020	34	13/06/2024	1485.23

P007	34	14/10/2023	3295.96
P011	34	17/05/2024	557.59
P014	48	25/11/2023	4309.19
P019	13	01/09/2023	459.8
P005	51	15/09/2023	3611.41
P002	18	29/09/2023	1042.35
P013	99	04/05/2024	6447.88
P018	16	08/05/2024	852.19
P004	5	13/12/2023	383.73
P020	39	12/11/2023	3125.6
P020	39	28/08/2023	3241.5
P018	14	27/03/2024	1026.26
P001	96	21/10/2023	4890.36
P006	41	16/03/2024	2695.06
P018	42	15/11/2023	3232.54
P018	59	05/09/2023	2097.61
P005	53	25/02/2024	989.48
P004	36	16/11/2023	3527.86
P006	98	28/07/2023	6724.66
P019	92	04/03/2024	4344.24
P014	32	03/07/2023	1054.13
P011	86	13/04/2024	6282.23
P015	99	11/06/2024	2555.09
P009	51	25/02/2024	1268.1
P020	98	10/06/2024	6790.65

P007	34	14/10/2023	3295.96
P012	55	10/08/2023	5358.27
P005	98	16/09/2023	8609.11
P018	59	21/01/2024	1762.14
P007	33	09/11/2023	1390.05
P011	1	01/05/2024	47.49
P009	59	08/02/2024	4758.8
P010	9	06/10/2023	550.41
P008	9	22/04/2024	725.2
P014	67	24/02/2024	6687.34
P005	28	23/03/2024	822.05
P011	13	13/10/2023	243.63
P015	67	03/05/2024	3773.72
P007	63	03/10/2023	4733.85
P001	72	20/06/2024	3695.39
P007	62	04/11/2023	5631.22
P018	87	26/09/2023	4055.76
P016	80	28/09/2023	6913.84
P003	27	22/06/2024	627.85
P018	31	19/08/2023	1942.4
P014	37	08/08/2023	3048.33
P018	61	13/08/2023	3541.86
P019	48	28/06/2024	2071.22
P014	94	05/06/2024	3415.33
P016	59	15/02/2024	888.3

P007	34	14/10/2023	3295.96
P002	18	21/01/2024	1210.07
P004	44	15/04/2024	364.17
P011	97	01/01/2024	3984.84
P001	27	17/06/2024	2262.68
P003	24	02/04/2024	2272.32
P003	23	18/04/2024	994.89
P013	65	19/12/2023	5833.07
P010	63	20/07/2023	4633.03
P016	40	08/02/2024	3762.71
P010	69	08/09/2023	4874.14
P014	92	10/07/2023	4090.95
P004	1	02/09/2023	49.02
P007	7	16/10/2023	101.11
P017	19	25/07/2023	1738.49
P008	98	09/08/2023	1751.51
P006	37	19/06/2024	3379.98
P005	34	01/02/2024	2003.73
P004	90	04/05/2024	6145.77
P013	55	17/09/2023	5339.32
P008	19	08/12/2023	1391.59
P001	37	01/02/2024	3141.14
P015	10	26/08/2023	575.43
P009	34	26/02/2024	3330.02
P013	92	13/01/2024	8113.38

P007	34	14/10/2023	3295.96
P012	84	10/12/2023	7546.22
P014	75	04/05/2024	2559.61
P014	24	29/07/2023	247.63
P012	12	28/03/2024	761.83
P008	76	02/01/2024	4284.95
P008	65	21/04/2024	2699.49
P010	5	31/10/2023	308.19
P010	14	05/01/2024	350.04
P020	1	23/03/2024	85.76
P002	29	11/10/2023	688.09
P016	99	17/08/2023	1687.11
P006	97	01/11/2023	4888.6

ChatGPT

Certainly! Here's a detailed plan for the verification step, including instructions to share the code on GitHub.

Verification Steps

1. Create a GitHub Repository:

- Create a new repository on GitHub named aws-etl-assessment.
- Clone the repository to your local machine.

2. Upload Code and Configuration:

- Organize your project files and folders as follows:sqlCopy code

- aws-etl-assessment/ ├── glue_job/ | ├── glue_job_script.py |──
lambda_function/ | ├── lambda_function.py |── sql/ | ├──
create_rds_table.sql |── s3/ | ├── upload_script.py |── sales_data.csv |──
README.md

Documenting the Process:

- In the README.md file, include detailed documentation covering:
 - Overview of the task.
 - Steps to set up and run each part (S3 upload, Glue job, Lambda function).
 - Any assumptions and decisions made.
 - How to verify the results.

4. Provide Verification Evidence:

- Include screenshots or logs showing the successful execution of each step.
- Add a SQL query result from the PostgreSQL database showing the inserted data.

Example Files

glue_job/glue_job_script.py:

pythonCopy code

```
import sys
from awsglue.transforms import *
from awsglue.utils import getResolvedOptions
from pyspark.context import SparkContext
from awsglue.context import GlueContext
from awsglue.job import Job

args = getResolvedOptions(sys.argv, ['JOB_NAME'])
sc = SparkContext()
glueContext = GlueContext(sc)
spark = glueContext.spark_session
job = Job(glueContext)
job.init(args['JOB_NAME'], args)

# Load data from S3
datasource0 = glueContext.create_dynamic_frame.from_options('s3',
{'paths': ['s3://<input-bucket>/sales_data.csv']}, format='csv',
format_options={"withHeader": True})

# Transform data
drop_duplicates = DynamicFrame.fromDF(datasource0.toDF().dropDuplicates(), glueContext,
'drop_duplicates')
apply_mapping = ApplyMapping.apply( frame=drop_duplicates,
mappings=[ ('ProductID', 'string', 'ProductID', 'string'), ('QuantitySold', 'int', 'QuantitySold',
'int'), ('SaleDate', 'string', 'SaleDate', 'date'), ('SaleAmount', 'double', 'SaleAmount',
'double') ])

# Write transformed data back to S3
datasink4 = glueContext.write_dynamic_frame.from_options( frame=apply_mapping,
connection_type="s3", connection_options={"path": "s3://<output-bucket>/transformed_sales_data/"},
format="csv")
job.commit()
```

lambda_function/lambda_function.py:

pythonCopy code

```
import json
import psycopg2
import boto3

def lambda_handler(event, context):
    s3 = boto3.client('s3')
    bucket = '<output-bucket>'
    key = 'transformed_sales_data/part-00000.csv'
    response = s3.get_object(Bucket=bucket, Key=key)
    lines =
```

```
response['Body'].read().decode('utf-8').split() conn = psycopg2.connect( host='<rds-
endpoint>', database='<database>', user='<username>', password='<password>' ) cur =
conn.cursor() for line in lines[1:]: # Skip header fields = line.split(',') cur.execute( "INSERT
INTO sales (ProductID, QuantitySold, SaleDate, SaleAmount) VALUES (%s, %s, %s,
%s)", (fields[0], int(fields[1]), fields[2], float(fields[3])) ) conn.commit() cur.close()
conn.close() return { 'statusCode': 200, 'body': json.dumps('Data inserted successfully')
}sql/create_rds_table.sql:
```

sqlCopy code

```
CREATE TABLE sales ( ProductID VARCHAR(10), QuantitySold INT, SaleDate DATE,
SaleAmount DECIMAL(10, 2));s3/upload_script.py:
```

pythonCopy code

```
import boto3s3 = boto3.client('s3')bucket_name = '<your-unique-bucket-
name>'file_path = 'path/to/sales_data.csv's3.upload_file(file_path, bucket_name,
'sales_data.csv')README.md:
```

markdownCopy code

AWS ETL Assessment## OverviewThis project demonstrates the end-to-end process of uploading a CSV file to an S3 bucket, performing ETL operations using AWS Glue, and using Lambda functions to store the processed data in an RDS PostgreSQL database.

Steps### 1. Upload File to S3- Run the `s3/upload_script.py` script to upload the `sales_data.csv` file to the S3 bucket.

2. AWS Glue ETL Job- The Glue job script is located at `glue_job/glue_job_script.py`.- Create a Glue job in the AWS console, upload this script, and set the necessary IAM roles and S3 paths.

3. AWS Lambda Function- The Lambda function code is in `lambda_function/lambda_function.py`.- Set up the Lambda function to trigger upon the completion of the Glue job.

4. RDS PostgreSQL Setup- Use the `sql/create_rds_table.sql` script to create the necessary table in your RDS PostgreSQL database.

Verification- Screenshots and logs of successful steps are included in the `verification` folder.- Run the provided SQL queries to verify the data in the PostgreSQL database.

Upload to GitHub

1. **Initialize Git Repository:**bashCopy code

2. git initgit add .git commit -m "Initial commit with project files"**Push to GitHub:**bashCopy code

```
git remote add origin https://github.com/<your-username>/aws-etl-assessment.gitgit
push -u origin masterThis detailed plan will help the candidate set up the project,
perform the required tasks, and verify the results. Ensure to replace placeholders
like <your-unique-bucket-name>, <input-bucket>, <output-bucket>, <rds-
endpoint>, <database>, <username>, and <password> with actual values.
```


