Solution to Module 4

2.

AQ1

```
SELECT Location_Name, Time_Year, Time_Month,
  SUM ( QUANTITY_ORDERED * Unit_Price ) AS SumJobAmt,
  SUM ( SUM ( QUANTITY_ORDERED * Unit_Price ) )
    OVER ( PARTITION BY Location_Name, Time_Year
      ORDER BY Time_Month
      ROWS UNBOUNDED PRECEDING ) AS CumSumAmt
FROM W_JOB_F, W_Location_D, W_TIME_D
WHERE W_Location_D.Location_ID = W_Job_F.Location_Id
  AND W_JOB_F.CONTRACT_DATE = W_TIME_D.Time_ID
GROUP BY Location_Name, Time_Year, Time_Month;
```

AQ2

```
SELECT Location_Name, Time_Year, Time_Month,
  AVG( QUANTITY_ORDERED * Unit_Price ) AS AvgJobAmount ,
  AVG( AVG( QUANTITY_ORDERED * Unit_Price ) )
   OVER ( PARTITION BY  Location_Name
   ORDER BY Time_Year, Time_Month
   ROWS BETWEEN 11 PRECEDING AND CURRENT ROW ) AS MovAvgAmtOrdered
 FROM W_JOB_F, W_Location_D, W_TIME_D
 WHERE W_Location_D.Location_ID = W_Job_F.Location_Id
   AND W_JOB_F.CONTRACT_DATE = W_TIME_D.Time_ID
 GROUP BY Location_Name, Time_Year, Time_Month;
```

AQ3

```
SELECT X1.Location_Name, X1.Time_Year,
      SUM(SumInvoiceAmt - TotalCosts) AS SumLocProfit,
      RANK() OVER ( PARTITION BY X1.Time_Year
       ORDER BY ( SUM(SumInvoiceAmt - TotalCosts) ) DESC ) AS RankProfitSum
 FROM LocCostSummary X1, LocRevenueSummary X2
 WHERE X1.Job_Id = X2.Job_Id
 GROUP BY X1.Location_Name, X1.Time_Year;
```

- Using base queries

```
SELECT X1.Location_Name, X1.Time_Year,
       SUM(SumInvoiceAmt - TotalCosts) AS SumLocProfit,
       RANK() OVER ( PARTITION BY X1.Time_Year
        ORDER BY ( SUM(SumInvoiceAmt - TotalCosts) ) DESC )  AS RankProfitSum
FROM
(
 SELECT W_Sub_Job_F.Job_Id, W_Location_D.LOCATION_ID,
        W_LOCATION_D.LOCATION_NAME,
        W_TIME_D.TIME_YEAR,  W_TIME_D.TIME_MONTH,
        SUM (Invoice_Quantity) AS SumInvoiceQty,
        SUM (Invoice_Amount) AS SumInvoiceAmt
  FROM W_Job_Shipment_F, W_Sub_Job_F, W_Location_D, W_Time_D,
       W_InvoiceLine_F, W_Job_F
  WHERE W_Sub_Job_F.Sub_Job_Id = W_Job_Shipment_F.Sub_Job_Id
    AND W_Job_Shipment_F.Invoice_Id = W_InvoiceLine_F.Invoice_Id
    AND W_Time_D.Time_Id = Contract_Date
    AND W_Location_D.Location_Id = W_InvoiceLine_F.Location_Id
    AND W_Job_F.Job_Id = W_Sub_Job_F.Job_Id
  GROUP BY W_Sub_Job_F.Job_Id, W_Location_D.LOCATION_ID,
          W_LOCATION_D.LOCATION_NAME, W_TIME_D.TIME_YEAR,
          W_TIME_D.TIME_MONTH
) X1,
(
 SELECT W_Sub_Job_F.Job_Id, W_Location_D.LOCATION_ID,
        W_LOCATION_D.LOCATION_NAME,
        W_TIME_D.TIME_YEAR,  W_TIME_D.TIME_MONTH,
        SUM(Cost_Labor) AS SumLaborCosts,
        SUM(Cost_Material) AS SumMaterialCosts,
        SUM(Cost_Overhead) AS SumOvrhdCosts,
        SUM(Machine_Hours * Rate_Per_Hour) AS SumMachineCosts,
        SUM(Quantity_Produced) AS SumQtyProduced,
        SUM(Cost_Labor + Cost_Material + Cost_Overhead +
          (Machine_Hours * Rate_Per_Hour)) AS TotalCosts
  FROM W_Job_F, W_Sub_Job_F, W_Location_D, W_Time_D, W_Machine_Type_D
  WHERE W_Job_F.Location_Id = W_Location_D.Location_Id
    AND W_Sub_Job_F.Machine_Type_Id = W_Machine_Type_D.Machine_Type_Id
    AND W_Time_D.Time_Id = Contract_Date
    AND W_Job_F.Job_Id = W_Sub_Job_F.Job_Id
  GROUP BY W_Sub_Job_F.Job_Id, W_Location_D.LOCATION_ID,
          W_LOCATION_D.LOCATION_NAME, W_TIME_D.TIME_YEAR,
          W_TIME_D.TIME_MONTH
) X2
 WHERE X1.Job_Id = X2.Job_Id
 GROUP BY X1.Location_Name, X1.Time_Year;
```

AQ4

```
SELECT X1.Location_Name, X1.Time_Year,
      SUM (SumInvoiceAmt - TotalCosts) / SUM(SumInvoiceAmt) AS ProfitMargin,
      RANK() OVER ( PARTITION BY X1.Time_Year
       ORDER BY ( SUM (SumInvoiceAmt - TotalCosts) / SUM(SumInvoiceAmt) ) DESC )  AS
RankProfitMargin
FROM LocCostSummary X1, LocRevenueSummary X2
WHERE X1.Job_Id = X2.Job_Id
GROUP BY X1.Location_Name, X1.Time_Year;

-- Base queries

SELECT X1.Location_Name, X1.Time_Year,
      SUM (SumInvoiceAmt - TotalCosts) / SUM(SumInvoiceAmt) AS ProfitMargin,
      RANK() OVER ( PARTITION BY X1.Time_Year
       ORDER BY ( SUM (SumInvoiceAmt - TotalCosts) / SUM(SumInvoiceAmt) )
        DESC )  AS RankProfitMargin
 FROM
 (
  SELECT W_Sub_Job_F.Job_Id, W_Location_D.LOCATION_ID,
       W_LOCATION_D.LOCATION_NAME,  W_TIME_D.TIME_YEAR,
       W_TIME_D.TIME_MONTH, SUM (Invoice_Quantity) AS SumInvoiceQty,
       SUM (Invoice_Amount) AS SumInvoiceAmt
  FROM W_Job_Shipment_F, W_Sub_Job_F, W_Location_D, W_Time_D,
     _InvoiceLine_F, W_Job_F
  WHERE W_Sub_Job_F.Sub_Job_Id = W_Job_Shipment_F.Sub_Job_Id
    AND W_Job_Shipment_F.Invoice_Id = W_InvoiceLine_F.Invoice_Id
    AND W_Time_D.Time_Id = Contract_Date
    AND W_Location_D.Location_Id = W_InvoiceLine_F.Location_Id
    AND W_Job_F.Job_Id = W_Sub_Job_F.Job_Id
  GROUP BY W_Sub_Job_F.Job_Id, W_Location_D.LOCATION_ID,
        W_LOCATION_D.LOCATION_NAME, W_TIME_D.TIME_YEAR,
        W_TIME_D.TIME_MONTH
 ) X1,
 (
 SELECT W_Sub_Job_F.Job_Id, W_Location_D.LOCATION_ID,
       W_LOCATION_D.LOCATION_NAME,
       W_TIME_D.TIME_YEAR,  W_TIME_D.TIME_MONTH,
       SUM(Cost_Labor) AS SumLaborCosts,
       SUM(Cost_Material) AS SumMaterialCosts,
       SUM(Cost_Overhead) AS SumOvrhdCosts,
       SUM(Machine_Hours * Rate_Per_Hour) AS SumMachineCosts,
       SUM(Quantity_Produced) AS SumQtyProduced,
       SUM(Cost_Labor + Cost_Material + Cost_Overhead +
         (Machine_Hours * Rate_Per_Hour)) AS TotalCosts
  FROM W_Job_F, W_Sub_Job_F, W_Location_D, W_Time_D, W_Machine_Type_D
  WHERE W_Job_F.Location_Id = W_Location_D.Location_Id
```

```
    AND W_Sub_Job_F.Machine_Type_Id = W_Machine_Type_D.Machine_Type_Id
    AND W_Time_D.Time_Id = Contract_Date
    AND W_Job_F.Job_Id = W_Sub_Job_F.Job_Id
  GROUP BY W_Sub_Job_F.Job_Id, W_Location_D.LOCATION_ID,
        W_LOCATION_D.LOCATION_NAME, W_TIME_D.TIME_YEAR,
        W_TIME_D.TIME_MONTH
 ) X2
WHERE X1.Job_Id = X2.Job_Id
GROUP BY X1.Location_Name, X1.Time_Year;
```

AQ5

```
SELECT X1.Job_Id, X1.Location_Name, X1.Time_Year, X1.Time_Year,
      (SumInvoiceAmt - TotalCosts) / SumInvoiceAmt AS ProfitMargin,
      PERCENT_RANK() OVER (
       ORDER BY ( (SumInvoiceAmt - TotalCosts) / SumInvoiceAmt ) )
        AS PercentRankProfitMargin
FROM LocCostSummary X1, LocRevenueSummary X2
WHERE X1.Job_Id = X2.Job_Id;
```

-- Using base queries

```
SELECT X1.Job_Id, X1.Location_Name, X1.Time_Year, X1.Time_Month,
     (SumInvoiceAmt - TotalCosts) / SumInvoiceAmt AS ProfitMargin,
     PERCENT_RANK() OVER (
       ORDER BY ( (SumInvoiceAmt - TotalCosts) / SumInvoiceAmt ) )
        AS PercentRankProfitMargin
 FROM
(
 SELECT W_Sub_Job_F.Job_Id, W_Location_D.LOCATION_ID,
       W_LOCATION_D.LOCATION_NAME,
       W_TIME_D.TIME_YEAR,  W_TIME_D.TIME_MONTH,
       SUM (Invoice_Quantity) AS SumInvoiceQty,
       SUM (Invoice_Amount) AS SumInvoiceAmt
  FROM W_Job_Shipment_F, W_Sub_Job_F, W_Location_D, W_Time_D,
      W_InvoiceLine_F, W_Job_F
  WHERE W_Sub_Job_F.Sub_Job_Id = W_Job_Shipment_F.Sub_Job_Id
    AND W_Job_Shipment_F.Invoice_Id = W_InvoiceLine_F.Invoice_Id
    AND W_Time_D.Time_Id = Contract_Date
    AND W_Location_D.Location_Id = W_InvoiceLine_F.Location_Id
    AND W_Job_F.Job_Id = W_Sub_Job_F.Job_Id
  GROUP BY W_Sub_Job_F.Job_Id, W_Location_D.LOCATION_ID,
     W_LOCATION_D.LOCATION_NAME, W_TIME_D.TIME_YEAR,
W_TIME_D.TIME_MONTH
 ) X1,
 (
 SELECT W_Sub_Job_F.Job_Id, W_Location_D.LOCATION_ID,
```

```
      W_LOCATION_D.LOCATION_NAME,
      W_TIME_D.TIME_YEAR,  W_TIME_D.TIME_MONTH,
      SUM(Cost_Labor) AS SumLaborCosts,
      SUM(Cost_Material) AS SumMaterialCosts,
      SUM(Cost_Overhead) AS SumOvrhdCosts,
      SUM(Machine_Hours * Rate_Per_Hour) AS SumMachineCosts,
      SUM(Quantity_Produced) AS SumQtyProduced,
      SUM(Cost_Labor + Cost_Material + Cost_Overhead +
        (Machine_Hours * Rate_Per_Hour)) AS TotalCosts
 FROM W_Job_F, W_Sub_Job_F, W_Location_D, W_Time_D, W_Machine_Type_D
 WHERE W_Job_F.Location_Id = W_Location_D.Location_Id
   AND W_Sub_Job_F.Machine_Type_Id = W_Machine_Type_D.Machine_Type_Id
   AND W_Time_D.Time_Id = Contract_Date
   AND W_Job_F.Job_Id = W_Sub_Job_F.Job_Id
 GROUP BY W_Sub_Job_F.Job_Id, W_Location_D.LOCATION_ID,
   W_LOCATION_D.LOCATION_NAME, W_TIME_D.TIME_YEAR,
W_TIME_D.TIME_MONTH
 ) X2
 WHERE X1.Job_Id = X2.Job_Id;
```

AQ6

```
- Using SELECT statement of AQ5 in the FROM clause

SELECT Job_Id, Location_Name, Time_Year, Time_Month,
      ProfitMargin, PercentRankProfitMargin
 FROM (
  SELECT X1.Job_Id, X1.Location_Name, X1.Time_Year, X1.Time_Month,
       (SumInvoiceAmt - TotalCosts) / SumInvoiceAmt AS ProfitMargin,
       PERCENT_RANK() OVER (
       ORDER BY ( (SumInvoiceAmt - TotalCosts) / SumInvoiceAmt ) )
        AS PercentRankProfitMargin
  FROM LocCostSummary X1, LocRevenueSummary X2
  WHERE X1.Job_Id = X2.Job_Id )
 WHERE PercentRankProfitMargin > 0.95;
```

AQ7

```
SELECT Sales_Class_Desc, Time_Year,
  SUM ( quantity_shipped - invoice_quantity ) as ReturnSum ,
  RANK() over ( PARTITION BY Time_Year
    ORDER BY SUM ( quantity_shipped - invoice_quantity ) DESC )
     AS RankReturnSum
 FROM W_INVOICELINE_F INNER JOIN W_TIME_D
    ON W_INVOICELINE_F.INVOICE_SENT_DATE = W_TIME_D.TIME_ID
```

```
 INNER JOIN W_Sales_Class_D
    ON W_INVOICELINE_F.Sales_Class_Id = W_Sales_Class_D.Sales_Class_Id
WHERE quantity_shipped > invoice_quantity
GROUP BY Sales_Class_Desc, Time_Year;
```

AQ8

```
SELECT Time_Year, Sales_Class_Desc,
  SUM ( quantity_shipped - invoice_quantity ) as SumReturnQty,
  Ratio_To_Report(SUM ( quantity_shipped - invoice_quantity ))
    OVER ( PARTITION BY Time_Year ) AS RatioReturnSum
 FROM W_INVOICELINE_F INNER JOIN W_TIME_D
     ON W_INVOICELINE_F.INVOICE_SENT_DATE = W_TIME_D.TIME_ID
   INNER JOIN W_Sales_Class_D
     ON W_INVOICELINE_F.Sales_Class_Id = W_Sales_Class_D.Sales_Class_Id
 WHERE quantity_shipped > invoice_quantity
 GROUP BY Sales_Class_Desc, Time_Year
 ORDER BY Time_Year, SUM( quantity_shipped - invoice_quantity );
```

AQ9

```
SELECT Location_Name, W_Time_D.Time_Year,
       SUM(BusDaysDiff) as SumDelayDays,
  RANK() OVER ( PARTITION BY W_Time_D.Time_Year
    ORDER BY SUM(BusDaysDiff) DESC) AS RankSumDelayDays,
  DENSE_RANK() OVER ( PARTITION BY W_Time_D.Time_Year
    ORDER BY SUM(BusDaysDiff) DESC) AS RankSumDelayDays
 FROM FirstShipmentDelays, W_Time_D
 WHERE W_Time_D.Time_Id = FirstShipmentDelays.Date_Ship_By
 GROUP BY Location_Name, W_Time_D.Time_Year;
```

AQ9

```
SELECT Location_Name, W_Time_D.Time_Year,
       SUM(BusDaysDiff) as SumDelayDays,
  RANK() OVER ( PARTITION BY W_Time_D.Time_Year
    ORDER BY SUM(BusDaysDiff) DESC) AS RankSumDelayDays,
  DENSE_RANK() OVER ( PARTITION BY W_Time_D.Time_Year
```

```
   ORDER BY SUM(BusDaysDiff) DESC) AS RankSumDelayDays
FROM FirstShipmentDelays, W_Time_D
WHERE W_Time_D.Time_Id = FirstShipmentDelays.Date_Ship_By
GROUP BY Location_Name, W_Time_D.Time_Year;
```

AQ10

```
SELECT Location_Name, W_Time_D.Time_Year,
      COUNT(*) AS NumJobs,
      SUM(BusDaysDiff) as SumDelayDays,
      SUM(Quantity_Ordered - SumDelayShipQty) / SUM(Quantity_Ordered)
       AS PromisedDelayRate,
 RANK() OVER ( PARTITION BY W_Time_D.Time_Year
   ORDER BY SUM(Quantity_Ordered - SumDelayShipQty) /
         SUM(Quantity_Ordered) DESC) AS RankDelayRate
FROM LastShipmentDelays, W_Time_D
WHERE W_Time_D.Time_Id = LastShipmentDelays.Date_Promised
GROUP BY Location_Name, W_Time_D.Time_Year;
```