12. In the `sales` collection, calculate a 3-day moving average of the `total_sales` for each product. You need to emit sales values by date and calculate a rolling average of the last 3 sales days.

```
db.sales.aggregate([
  {
    $addFields: {
      saleDate: {
        $dateFromString: { dateString: "$date", format: "%Y-%m-%d" }
      },
      totalSaleAmount: {
        $multiply: ["$quantity", "$price"]
      }
    }
  },
  {
    $sort: { product_id: 1, saleDate: 1 }
  },
  {
    $setWindowFields: {
      partitionBy: "$product_id",
      sortBy: { saleDate: 1 },
      output: {
        threeDayMovingAvg: {
          $avg: "$totalSaleAmount",
          window: { documents: [-2, 0] }
        }
      }
    }
  },
  {
    $project: {
      _id: 0,
      product_id: 1,
      date: "$saleDate",
      movingAverage: "$threeDayMovingAvg"
    }
  }
]);
```

```
schoolDB> db.sales.aggregate([
...     {
...       $addFields: {
...         saleDate: {
...           $dateFromString: { dateString: "$date", format: "%Y-%m-%d" }
...         },
...         totalSaleAmount: {
...           $multiply: ["$quantity", "$price"]
...         }
...       }
...     },
...     {
...       $sort: { product_id: 1, saleDate: 1 }
...     },
...     {
...       $setWindowFields: {
...         partitionBy: "$product_id",
...         sortBy: { saleDate: 1 },
...         output: {
...           threeDayMovingAvg: {
...             $avg: "$totalSaleAmount",
...             window: { documents: [-2, 0] }
...           }
...         }
...       }
...     },
...     {
...       $project: {
...         _id: 0,
...         product_id: 1,
...         date: "$saleDate",
...         movingAverage: "$threeDayMovingAvg"
...       }
...     }
... ]);
```

```
[
  {
    product_id: 'A123',
    date: ISODate('2024-10-01T00:00:00.000Z'),
    movingAverage: 159.9
  },
  {
    product_id: 'A123',
    date: ISODate('2024-10-02T00:00:00.000Z'),
    movingAverage: 119.92500000000001
  },
  {
    product_id: 'A123',
    date: ISODate('2024-10-03T00:00:00.000Z'),
    movingAverage: 122.58999999999999
  },
  {
    product_id: 'A123',
    date: ISODate('2024-10-04T00:00:00.000Z'),
    movingAverage: 106.60000000000001
  },
  {
    product_id: 'B456',
    date: ISODate('2024-10-01T00:00:00.000Z'),
    movingAverage: 199.8
  },
  {
    product_id: 'B456',
    date: ISODate('2024-10-02T00:00:00.000Z'),
    movingAverage: 174.825
  },
  {
    product_id: 'B456',
    date: ISODate('2024-10-03T00:00:00.000Z'),
    movingAverage: 199.79999999999998
  },
  {
    product_id: 'B456',
    date: ISODate('2024-10-04T00:00:00.000Z'),
    movingAverage: 166.5
  }
]
```