

Assignment 8: "Microservice A" Implementation (Milestone #2)

Introduction

This assignment includes two microservices **Login Trends Analytics microservice** and **User Preferences microservice**.

Login Trends Analytics Microservice

1) Login Trend Analytics

Login Trend Analytics is a vital component in understanding user engagement and behavior within a digital platform. By analyzing login patterns, organizations can gain insights into peak usage times, frequency of user logins, and the duration of user sessions. This information is crucial for optimizing system performance, as it allows for better resource allocation during high-traffic periods. Additionally, identifying trends such as increased logins during specific events or promotions can help in strategizing future marketing efforts. Login Trend Analytics also aids in enhancing user experience by highlighting potential issues such as login difficulties or prolonged inactivity, enabling timely interventions to improve user satisfaction and retention.

2) Real-Time Activity Alert Analytics

Real-Time Activity Alert Analytics is an essential tool for monitoring and responding to user actions and system events as they occur. This type of analytics provides immediate insights into various activities, such as user logins, transactions, and interactions with different features. By processing and analyzing this data in real-time, organizations can swiftly detect and respond to anomalies, such as suspicious login attempts or unusual transaction patterns, enhancing security and reducing potential risks. Real-Time Activity Alert Analytics also helps in maintaining system performance and reliability by promptly identifying and addressing issues like system errors or performance bottlenecks. Furthermore, this proactive approach allows businesses to improve user experience by providing timely responses and support, thereby increasing user satisfaction and trust in the platform.

3) Personalized Usage Report Analytics

Personalized Usage Report Analytics provides tailored insights into individual user behaviors and interactions within a digital platform. By analyzing data specific to each user's activities, such as feature usage, login frequency, and time spent on various functionalities, these reports offer a detailed understanding of user preferences and patterns. This personalized approach enables organizations to deliver a more customized user experience, suggesting features or content that align with the user's interests and habits. Additionally, these reports can identify areas where users might be encountering difficulties, allowing for targeted improvements and support. Ultimately, Personalized Usage Report Analytics enhances user engagement and satisfaction by ensuring that the platform evolves in response to the unique needs and behaviors of its users.

3) Contacting Personalized Usage Report Analytics Microservice

1. Base URL

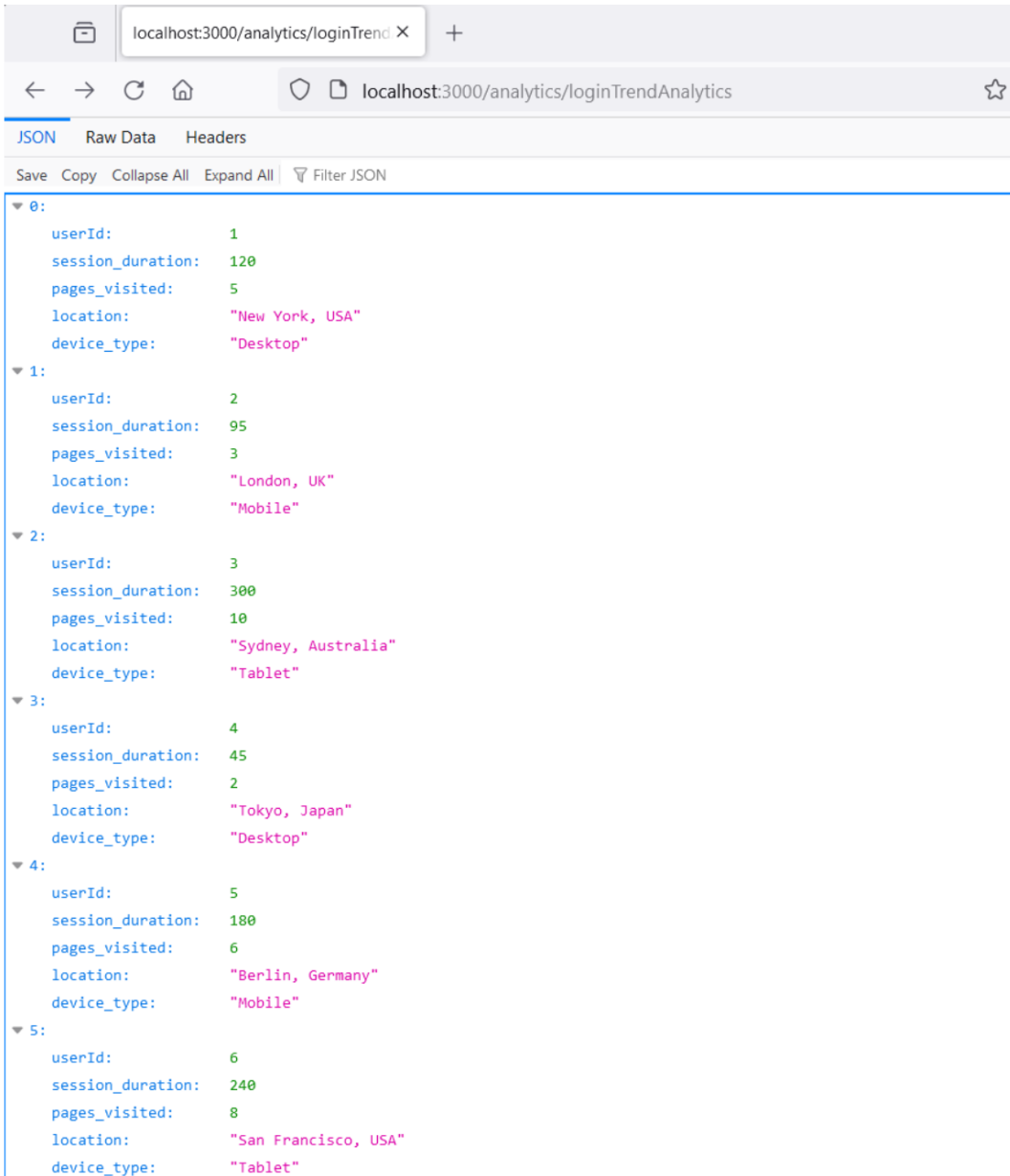
http://localhost:3000/analytics/loginTrendAnalytics

2. GET Request: Retrieve All Activities

```
// Function to get analytics for a specific user
async function getLoginTrendAnalytics(userId) {
  try {
    const response = await axios.get(`${_USER_BASE_URL}/${userId}`);
    console.log(`Login Trend Analytics for User ${userId}:`, response.data);
  } catch (error) {
    console.error(`Error fetching analytics for user ${userId}:`, error.message);
  }
}
```

3. Sample Response

```
Login Trend Analytics for User 1: {
  userId: 1,
  session_duration: 120,
  pages_visited: 5,
  location: 'New York, USA',
  device_type: 'Desktop'
}
```



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localhost:3000/analytics/loginTrendAnalytics

JSON Raw Data Headers

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```
0:
  userId: 1
  session_duration: 120
  pages_visited: 5
  location: "New York, USA"
  device_type: "Desktop"
1:
  userId: 2
  session_duration: 95
  pages_visited: 3
  location: "London, UK"
  device_type: "Mobile"
2:
  userId: 3
  session_duration: 300
  pages_visited: 10
  location: "Sydney, Australia"
  device_type: "Tablet"
3:
  userId: 4
  session_duration: 45
  pages_visited: 2
  location: "Tokyo, Japan"
  device_type: "Desktop"
4:
  userId: 5
  session_duration: 180
  pages_visited: 6
  location: "Berlin, Germany"
  device_type: "Mobile"
5:
  userId: 6
  session_duration: 240
  pages_visited: 8
  location: "San Francisco, USA"
  device_type: "Tablet"
```

3) Contacting Personalized Usage Report Analytics Microservice

1. Base URL

<http://localhost:3000/analytics/realTimeActivityAlertAnalytics>

2. GET Request: Retrieve All Activities

```
// Function to get realtime activity alert analytics for a specific user
async function getRealTimeActivityAlertAnalytics() {
  try {
    const response = await axios.get(`${USER_BASE_URL}/realTimeActivityAlertAnalytics/`);
    console.log('Realtime Activity Alert Analytics', response.data);
  } catch (error) {
    console.error('Error fetching realtime activity alert analytics:', error.message);
  }
}
```

3. Sample Response

```
Realtime Activity Alert Analytics [  
  {  
    userId: 1,  
    type: 'payment',  
    timestamp: '2024-05-23T12:30:45Z',  
    transactionId: 'TX123456789',  
    amount: 250,  
    currency: 'USD',  
    paymentMethod: 'credit_card',  
    status: 'completed'  
  },  
  {  
    userId: 2,  
    type: 'payment',  
    timestamp: '2024-05-23T13:40:20Z',  
    transactionId: 'TX987654321',  
    amount: 125.75,  
    currency: 'USD',  
    paymentMethod: 'paypal',  
    status: 'pending'  
  },  
  {  
    userId: 3,  
    type: 'payment',  
    timestamp: '2024-05-23T14:50:10Z',  
    transactionId: 'TX123789456',  
    amount: 89.99,  
    currency: 'EUR',  
    paymentMethod: 'debit_card',  
    status: 'completed'  
  },  
  {  
    userId: 4,  
    type: 'payment',  
    timestamp: '2024-05-23T15:05:30Z',  
    transactionId: 'TX456123789',  
    amount: 300,  
    currency: 'GBP',  
    paymentMethod: 'bank_transfer',  
    status: 'failed'  
  },  
  {  
    userId: 5,  
    type: 'payment',  
    timestamp: '2024-05-23T16:20:15Z',  
    transactionId: 'TX789456123',  
    amount: 45.5,  
    currency: 'USD',  
    paymentMethod: 'credit_card',  
    status: 'completed'  
  }  
]
```

localhost:3000/analytics/realTimeA

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JSONRaw DataHeaders

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▼ 0:

userId:

1

type:

"payment"

timestamp:

"2024-05-23T12:30:45Z"

transactionId:

"TX123456789"

amount:

250

currency:

"USD"

paymentMethod:

"credit_card"

status:

"completed"

▼ 1:

userId:

2

type:

"payment"

timestamp:

"2024-05-23T13:40:20Z"

transactionId:

"TX987654321"

amount:

125.75

currency:

"USD"

paymentMethod:

"paypal"

status:

"pending"

▼ 2:

userId:

3

type:

"payment"

timestamp:

"2024-05-23T14:50:10Z"

transactionId:

"TX123789456"

amount:

89.99

currency:

"EUR"

paymentMethod:

"debit_card"

status:

"completed"

▼ 3:

userId:

4

type:

"payment"

timestamp:

"2024-05-23T15:05:30Z"

transactionId:

"TX456123789"

amount:

300

currency:

"GBP"

paymentMethod:

"bank_transfer"

status:

"failed"

3) Contacting Personalized Usage Report Analytics Microservice

1. Base URL

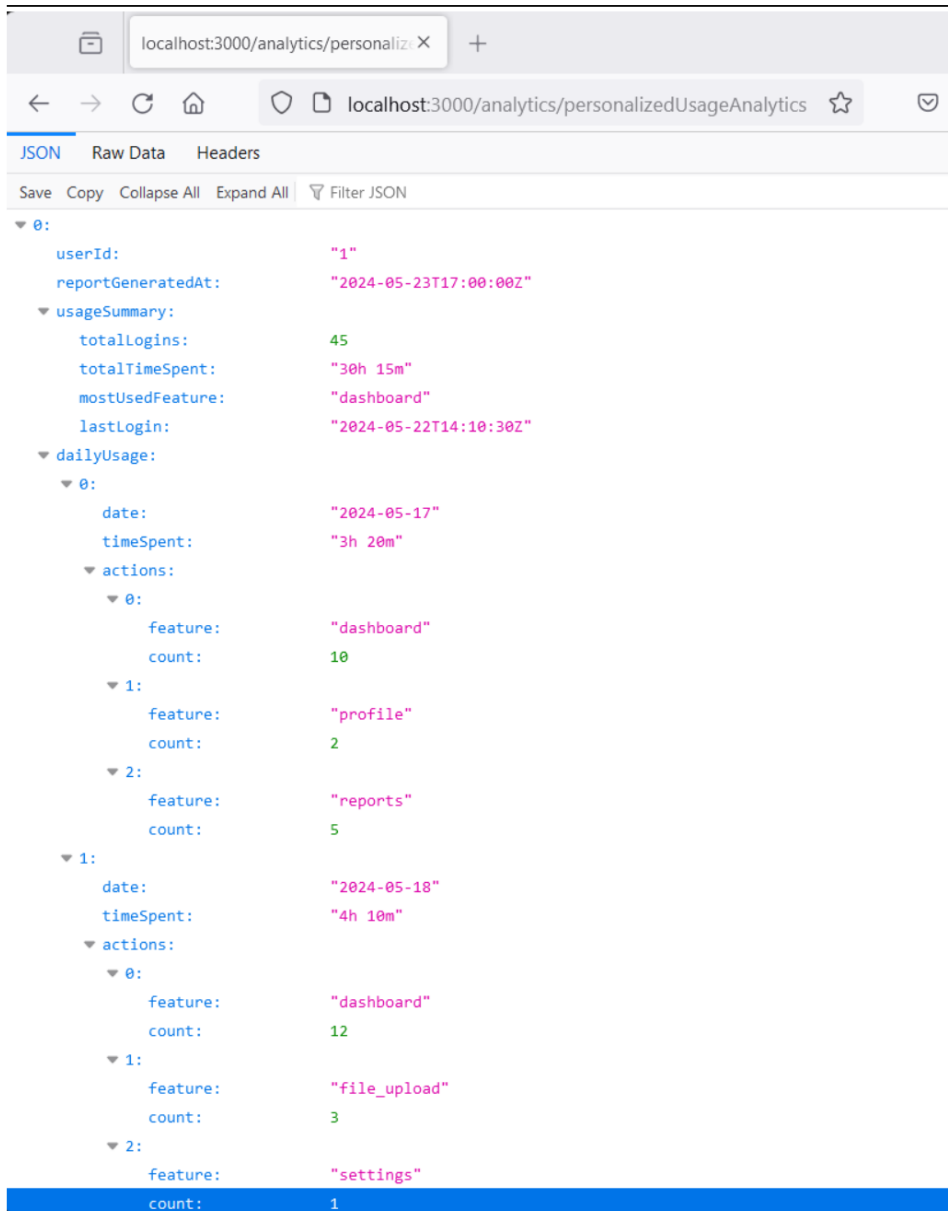
http://localhost:3000/analytics/personalizedUsageAnalytics

2. GET Request: Retrieve All Activities

```
// Function to get realtime activity alert analytics for a specific user
async function getPersonalizedUsageAnalytics() {
  try {
    const response = await axios.get(`${_USER_BASE_URL}/personalizedUsageAnalytics/`);
    console.log(`Personalized Usage Report Analytics`, response.data);
  } catch (error) {
    console.error(`Error fetching realtime activity alert analytics:`, error.message);
  }
}
```

3. Sample Response

```
Personalized Usage Report Analytics [
  {
    userId: '1',
    reportGeneratedAt: '2024-05-23T17:00:00Z',
    usageSummary: {
      totalLogins: 45,
      totalTimeSpent: '30h 15m',
      mostUsedFeature: 'dashboard',
      lastLogin: '2024-05-22T14:10:30Z'
    },
    dailyUsage: [ [Object], [Object], [Object], [Object], [Object] ],
    recommendations: {
      increaseUsageOfFeatures: [Array],
      reduceTimeSpentOn: [Array],
      tips: [Array]
    }
  }
]
```



User Preference Microservice

1) User Preference Microservices

The User Preference micro service is designed to manage and store individual user settings, enabling a personalized and tailored user experience. This microservice allows users to define their preferences, such as notification methods (email, SMS, push), preferred language, theme (dark or light), default payment methods, and notification times. By centralizing these preferences, the service ensures that each user's interaction with the application is customized according to their specific needs and habits. Additionally, the service can adjust these settings dynamically based on usage patterns, enhancing usability and satisfaction by providing a more intuitive and responsive interface.

3) Contacting User Preferences Microservice

1. Base URL

`http://localhost:4000/userPreferences`

2. GET Request: Retrieve All User Preferences

```
// Function to get preferences for all users
async function getAllUserPreferences() {
  try {
    const response = await axios.get(_USER_BASE_URL);
    console.log('All User Preferences:', response.data);
  } catch (error) {
    console.error('Error fetching all user preferences:', error.message);
  }
}

// Function to get preferences for a specific user
async function getUserPreferences(userId) {
  try {
    const response = await axios.get(`${_USER_BASE_URL}/${userId}`);
    console.log(`Preferences for User ${userId}:`, response.data);
  } catch (error) {
    console.error(`Error fetching preferences for user ${userId}:`, error.message);
  }
}
```


3. Sample Response

```
All User Preferences: [
  {
    userId: 1,
    'notifications.email': true,
    'notifications.sms': false,
    'notifications.push': true,
    'preferences.theme': 'dark',
    'preferences.language': 'en',
    defaultPaymentMethod: 'credit_card',
    'notificationTimes.morning': '08:00',
    'notificationTimes.evening': '18:00'
  },
  {
    userId: 2,
    'notifications.email': true,
    'notifications.sms': true,
    'notifications.push': false,
    'preferences.theme': 'light',
    'preferences.language': 'es',
    defaultPaymentMethod: 'paypal',
    'notificationTimes.morning': '07:30',
    'notificationTimes.evening': '19:00'
  },
  {
    userId: 3,
    'notifications.email': false,
    'notifications.sms': true,
    'notifications.push': true,
    'preferences.theme': 'dark',
    'preferences.language': 'fr',
    defaultPaymentMethod: 'bank_transfer',
    'notificationTimes.morning': '09:00',
    'notificationTimes.evening': '20:00'
  },
  {
    userId: 4,
    'notifications.email': true,
    'notifications.sms': true,
    'notifications.push': true,
    'preferences.theme': 'light',
    'preferences.language': 'de',
    defaultPaymentMethod: 'debit_card',
    'notificationTimes.morning': '06:30',
    'notificationTimes.evening': '17:30'
  }
]
Preferences for User 1: {
  userId: 1,
  'notifications.email': true,
  'notifications.sms': false,
  'notifications.push': true,
  'preferences.theme': 'dark',
  'preferences.language': 'en',
  defaultPaymentMethod: 'credit_card',
  'notificationTimes.morning': '08:00',
  'notificationTimes.evening': '18:00'
}
Preferences for User 2: {
  userId: 2,
  'notifications.email': true,
  'notifications.sms': true,
  'notifications.push': false,
  'preferences.theme': 'light',
  'preferences.language': 'es',
  defaultPaymentMethod: 'paypal',
  'notificationTimes.morning': '07:30',
  'notificationTimes.evening': '19:00'
}
```

```
▼ 0:
  userId: 1
  notifications.email: true
  notifications.sms: false
  notifications.push: true
  preferences.theme: "dark"
  preferences.language: "en"
  defaultPaymentMethod: "credit_card"
  notificationTimes.morning: "08:00"
  notificationTimes.evening: "18:00"
▼ 1:
  userId: 2
  notifications.email: true
  notifications.sms: true
  notifications.push: false
  preferences.theme: "light"
  preferences.language: "es"
  defaultPaymentMethod: "paypal"
  notificationTimes.morning: "07:30"
  notificationTimes.evening: "19:00"
▼ 2:
  userId: 3
  notifications.email: false
  notifications.sms: true
  notifications.push: true
  preferences.theme: "dark"
  preferences.language: "fr"
  defaultPaymentMethod: "bank_transfer"
  notificationTimes.morning: "09:00"
  notificationTimes.evening: "20:00"
▼ 3:
  userId: 4
  notifications.email: true
  notifications.sms: true
  notifications.push: true
  preferences.theme: "light"
  preferences.language: "de"
  defaultPaymentMethod: "debit_card"
  notificationTimes.morning: "06:30"
  notificationTimes.evening: "17:30"
```

Communication between User Trends Analytics Microservice & User Preference Microservice

From Login Trends Microservice we can call User Preferences Microservices to get preferences for a specific user. In this example we get user preferences for UserId 1.

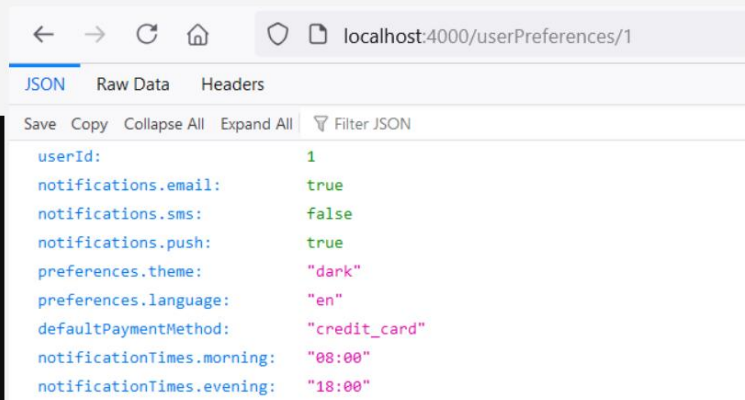
```
// Function to get analytics for a specific user
async function getUserPreferences(userId) {
  try {
    const response = await axios.get(`${_USER_PREF_URL}/${userId}`);
    console.log(`User Preferences for User ${userId}:`, response.data);
  } catch (error) {
    console.error(`Error fetching analytics for user ${userId}:`, error.message);
  }
}

// Example usage
getAllUserAnalytics();
getUserAnalytics(1);
getUserAnalytics(2);

getLoginTrendAnalytics(1);
getRealTimeActivityAlertAnalytics();
getPersonalizedUsageAnalytics();
getUserPreferences();
```

3. Sample Response

```
Preferences for User 1: {
  userId: 1,
  'notifications.email': true,
  'notifications.sms': false,
  'notifications.push': true,
  'preferences.theme': 'dark',
  'preferences.language': 'en',
  defaultPaymentMethod: 'credit_card',
  'notificationTimes.morning': '08:00',
  'notificationTimes.evening': '18:00'
}
```



localhost:4000/userPreferences/1	
JSON	Raw Data Headers
Save Copy Collapse All Expand All Filter JSON	
userId:	1
notifications.email:	true
notifications.sms:	false
notifications.push:	true
preferences.theme:	"dark"
preferences.language:	"en"
defaultPaymentMethod:	"credit_card"
notificationTimes.morning:	"08:00"
notificationTimes.evening:	"18:00"

UML Sequence Diagram

UML Sequence Diagram

