### **Technical Round 1: Analytics Proposal**

### **Group Info Analytics**

1. **Group Member-to-Admin Ratio  
   Description:** Calculates the ratio of members to administrators in each group to assess administrative oversight.
2. **Average Group Size by Type  
   Description:** Determines the average number of members for each group type (public, private) to analyze engagement trends.
3. **Bot Proportion in Groups  
   Description:** Computes the proportion of bots to total members, helping identify the prevalence of automated members.
4. **Pinned Message Activity  
   Description:** Tracks how frequently pinned messages are updated, indicating the group's effort in highlighting important information.
5. **Admin Contribution  
   Description:** Measures the total number of administrators in all groups and their average participation rate to determine admin engagement.
6. **Inactive Groups  
   Description:** Lists groups with low member counts and no pinned messages, identifying inactive communities.
7. **Group Longevity  
   Description:** Calculates the age of a group by analyzing the oldest pinned message timestamp to evaluate group stability.
8. **Pinned Message Reachability  
   Description:** Measures the time between setting a pinned message and its visibility among members, indicating information dissemination efficiency.

### **Member Info Analytics**

1. **Active Member Count by Group  
   Description:** Counts the number of active members (non-bots) in each group to assess engagement levels.
2. **Member Role Distribution  
   Description:** Analyzes the distribution of roles (admin, moderator, member) within each group to highlight role diversity.
3. **Retention Rate  
   Description:** Tracks the number of members who remain in a group over time to analyze group stickiness and loyalty.
4. **Bot-to-Human Ratio in Members  
   Description:** Calculates the ratio of bots to human members across all groups to assess authenticity.
5. **Member Activity by Role  
   Description:** Analyzes activity levels (e.g., message count) of members based on their roles to provide insights into engagement.
6. **New Member Growth Rate  
   Description:** Tracks the rate of new member additions over time to indicate group popularity.

### **Message Info Analytics**

1. **Daily Messages Sent  
   Description:** Tracks the number of messages sent daily in each group to identify engagement patterns.
2. **Top Contributors by Message Volume  
   Description:** Lists members who contribute the highest volume of messages to highlight key contributors.
3. **Peak Activity Periods  
   Description:** Analyzes timestamps to identify the most active message exchange periods.
4. **Most Popular Hashtags  
   Description:** Identifies hashtags that appear most frequently to highlight key interests or campaigns.
5. **Message Forwarding Trends  
   Description:** Tracks the frequency and patterns of message forwarding to indicate virality.
6. **Average Message Length  
   Description:** Measures the average length of text messages to provide insights into communication style.

### **Technical Round 2 – Admin Dashboard Design**

### **30 Analytics/Visualizations for Admin Dashboard**

1. **Name**: Total Members  
    **Description**: Displays the total number of members in the Telegram group. Helps admins track the group's overall size.
2. **Name**: New Members  
    **Description**: Displays the number of new members who joined the group in a given period. Helps admins track growth and user acquisition.
3. **Name**: Members Left  
    **Description**: Displays the number of members who left the group. Useful for admins to assess retention and engagement.
4. **Name**: Messages Sent  
    **Description**: Displays the total number of messages sent in the group. Helps admins track activity and communication volume.
5. **Name**: Most Active Users  
    **Description**: Displays the users who have been the most active in the group, based on their message volume and interactions. Assists admins in recognizing top contributors.
6. **Name**: Least Active Users  
    **Description**: Displays the users with the least activity in the group. Helps admins identify members who may need engagement.
7. **Name**: Media Shared  
    **Description**: Displays the total amount of media (images, videos, etc.) shared in the group. Useful for tracking content sharing behavior.
8. **Name**: Most Shared Links  
    **Description**: Displays the links that have been shared the most in the group. Helps admins identify trending topics or popular external content.
9. **Name**: Top Hashtags  
    **Description**: Displays the most used hashtags in the group. Assists admins in understanding common topics and themes being discussed.
10. **Name**: Admin Actions  
     **Description**: Displays the actions taken by group admins, such as banning or promoting members. Helps track admin involvement and decisions.
11. **Name**: Peak Activity Times  
     **Description**: Displays the times of day when the group experiences the most activity. Helps admins optimize posting times and plan activities.
12. **Name**: Banned Users Count  
     **Description**: Displays the number of banned users in the group. Helps admins keep track of moderation efforts and prevent spam or inappropriate behavior.
13. **Name**: Reported Messages  
     **Description**: Displays the number of messages reported by users. Assists admins in identifying and addressing problematic content.
14. **Name**: Bot Commands Usage  
     **Description**: Displays how often bot commands are used in the group. Helps admins understand the utilization of automation and bot services.
15. **Name**: Polls Created  
     **Description**: Displays the number of polls created in the group. Helps admins monitor user engagement through interactive content.
16. **Name**: Polls Participation  
     **Description**: Displays the level of participation in polls. Useful for admins to gauge user interest in polls and feedback.
17. **Name**: Stickers and Emojis Usage  
     **Description**: Displays the frequency of stickers and emojis being used in the group. Helps admins assess the group’s tone and communication style.
18. **Name**: Group Description Changes  
     **Description**: Displays the number of times the group description has been changed. Helps track updates to group settings and clarify group guidelines.
19. **Name**: Group Photo Changes  
     **Description**: Displays the number of times the group photo has been changed. Assists admins in tracking changes in group identity or branding.
20. **Name**: Pinned Messages Count  
     **Description**: Displays the number of messages pinned in the group. Helps admins identify important messages and ensure visibility.
21. **Name**: Join Requests  
     **Description**: Displays the number of users requesting to join the group. Helps admins monitor potential group growth and member vetting.
22. **Name**: Member Invitations  
     **Description**: Displays the number of invitations sent to join the group. Helps admins track how members are recruiting new users.
23. **Name**: Group Title Changes  
     **Description**: Displays the number of times the group title has been changed. Helps track branding or focus changes for the group.
24. **Name**: User Inactivity Alerts  
     **Description**: Displays the number of inactivity alerts issued to users. Helps admins encourage more participation from less active users.
25. **Name**: Most Mentioned Users  
     **Description**: Displays the users who are mentioned most frequently in the group. Helps admins identify influential or frequently discussed members.
26. **Name**: Message Deletion Rate  
     **Description**: Displays the rate at which messages are deleted in the group. Helps admins assess content moderation and cleanup activities.
27. **Name**: Admin Response Rate  
     **Description**: Displays how frequently admins respond to messages. Helps track admin engagement and user support within the group.
28. **Name**: Group Growth Rate  
     **Description**: Displays the rate at which the group is growing in terms of new members joining. Helps admins track the success of recruitment efforts.
29. **Name**: User Engagement Rate  
     **Description**: Displays the level of user engagement, such as comments, likes, and interactions with posts. Helps assess how engaged members are with the group.
30. **Name**: User Retention Rate  
     **Description**: Displays the rate at which users remain in the group over time. Helps admins assess the effectiveness of retention strategies and overall group health.