**Deployment** – ML orqali train qilingan modelni real hayotga tadbiq etish.

**Deployment strategy**

**Rolling**: Qismlarga bo’lgan holda yangi versiani deploy qiladi.

**Blue-Green**: Yangi va eski versialarni o’rtasi almashinish orqali deploy qiladi.

**Canary**: kichik guruh foydalanuvchilar uchun deploy qilib keyin boshqalarga deploy qilinadi.

**Shadow**: Userga tasir qilmagan holda yangi versiani deploy qiladi.

**Feature Flags:** yangi feature larni o’chirish yoki faollashtirish mumkin

**Immutable**: Yangi versia eskisini butunlay almashtiradi, yangilanish bo’lmaydi.

**A/B Testing**: Ikki xil versiya ikki xil grux foydalanuvchilar uchun deploy qilinadi

Automation:

Human 🡪 Shadow 🡪 AI Assitance 🡪 Partial Automation 🡪 full automation

Monitoring:

Dashboard 🡪 Real time

Log-Based 🡪 Historical

Alerting 🡪 Fast response

Dashboard Monitoring

Fraction of Non-Null outputs

Fraction of Missing Input Values

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| --- | --- | --- |
| A/B testing | 2 ta version bo’lsa va eng yaxshini deploy qilish uchun ishlatiladi. | Movie recommendation system, A(like laridan kelib chiqib)/B (comment lardan kelib chiqib) |
| Recommendation system A(kasallik tarixidan)/B(analizlardan kelib chiqib) |
| Feature Flag | Malum funksiyalardan cheklab qo’yish mumkin | Image generation service; premium version/base version features |
|  | Online service; Subscribed user ga full imkoniyat, un-subscribed user ga limited imkoniyatlar |
| Immutable | Butunlay yangi versiyani deploy qilishda ishlatiladi | Yangi structure dagi model deploy qilishda, eski model bilan nizo chiqmasligi uchun. |
|  |
| Rolling/Canary | Bosqichma bosqich yangili kiritishda ishlatiladi | Auto filling in images feature, photo shop dasturlari uchun |
| Tug’ilgan kun sovg’asi uchun recommendation beradigan feature for Instagram, facebook etc. |
| Shadow | Yangilik qanday natija ko’rsatishini bilish uchun | Autonomous Vehicle uchun object detection model deploy qilish. Yangi model decision-making da qatnashmaydi ammo uni ko’rsatkichlari o’rganiladi |
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| Blue-Green | Universal deployment |  |
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