Лабораторная работа №9.

Задание 1.

```
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apiVersion: batch/v1
kind: Job
metadata:
  name: file-generator-job
spec:
  template:
    spec:
      containers:
      - name: task
        image: alpine
        command:
        - /bin/sh
        - -c
        - |
          echo "----- BEGIN -----"
          mkdir output
          touch numbers.txt
          for i in $(seq 1 10); do
            echo $RANDOM >> /output/numbers.txt
          done
          echo "----- END -----"
          cat /output/numbers.txt
      restartPolicy: Never
```

```
ptashko@MacBook-Air--Artem K8S % kubectl apply -f file-generator-job.yaml
job.batch/file-generator-job created
ptashko@MacBook-Air--Artem K8S % kubectl logs jobs/file-generator-job
----- BEGIN -----
----- END -----
24240
8023
6222
11653
12525
20521
12388
8038
2240
14321
ptashko@MacBook-Air--Artem K8S %
```

Задание 2.

```
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apiVersion: batch/v1
kind : Job
metadata:
  name: batch-processor
spec:
  completions: 8
  parallelism: 3
  template:
    spec:
      containers:
      - name: worker
        image: nginx:latest
        command:
        - /bin/sh
        - -c
        - |
          echo $HOSTNAME
      restartPolicy: OnFailure
```

```
ptashko@MacBook-Air--Artem K8S % nano batch-job.yaml
ptashko@MacBook-Air--Artem K8S % kubectl apply -f batch-job.yaml
job.batch/batch-processor created
ptashko@MacBook-Air--Artem K8S % kubectl get jobs
NAME                   STATUS      COMPLETIONS   DURATION   AGE
batch-processor        Running     0/8           20s        20s
file-generator-job     Complete    1/1           4s         3d6h
```

```
ptashko@MacBook-Air--Artem K8S % kubectl get pods --selector=job-name=batch-processor
NAME                      READY    STATUS             RESTARTS   AGE
batch-processor-2cj9x     0/1      ContainerCreating  0          37s
batch-processor-9bvjp     0/1      ContainerCreating  0          37s
batch-processor-tsggp     0/1      ContainerCreating  0          37s
ptashko@MacBook-Air--Artem K8S % kubectl describe job batch-processor
Name:             batch-processor
Namespace:        default
Selector:         batch.kubernetes.io/controller-uid=c5453ae5-a755-461a-9bbf-5397e8f994d1
Labels:           batch.kubernetes.io/controller-uid=c5453ae5-a755-461a-9bbf-5397e8f994d1
                  batch.kubernetes.io/job-name=batch-processor
                  controller-uid=c5453ae5-a755-461a-9bbf-5397e8f994d1
                  job-name=batch-processor
Annotations:      <none>
Parallelism:      3
Completions:      8
Completion Mode:  NonIndexed
Suspend:          false
Backoff Limit:    6
Start Time:       Thu, 13 Nov 2025 16:01:33 +0300
Pods Statuses:    3 Active (0 Ready) / 0 Succeeded / 0 Failed
Pod Template:
  Labels:  batch.kubernetes.io/controller-uid=c5453ae5-a755-461a-9bbf-5397e8f994d1
           batch.kubernetes.io/job-name=batch-processor
           controller-uid=c5453ae5-a755-461a-9bbf-5397e8f994d1
           job-name=batch-processor
  Containers:
   worker:
    Image:        nginx:latest
    Port:         <none>
    Host Port:    <none>
    Command:
      /bin/sh
      -c
      echo $HOSTNAME

    Environment:    <none>
    Mounts:         <none>
  Volumes:          <none>
  Node-Selectors:   <none>
  Tolerations:      <none>
Events:
  Type    Reason           Age   From            Message
  ----    ------           ----  ----            -------
  Normal  SuccessfulCreate 48s   job-controller  Created pod: batch-processor-9bvjp
  Normal  SuccessfulCreate 48s   job-controller  Created pod: batch-processor-tsggp
  Normal  SuccessfulCreate 48s   job-controller  Created pod: batch-processor-2cj9x
ptashko@MacBook-Air--Artem K8S %
```

Задание 3.

```
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apiVersion: batch/v1
kind: Job
metadata:
  name: fault-tolerant-job
spec:
  completions: 4
  backoffLimit: 4
  template:
    spec:
      containers:
        - name: worker
          image: nginx:latest
          command:
          - /bin/sh
          - -c
          - |
            RANDOM_NUMBER=$RANDOM
            if [ $(( $RANDOM_NUMBER % 2 )) -eq 0];
            then
              exit 0
            else
              exit 1
            fi
      restartPolicy: OnFailure
```

```
ptashko@MacBook-Air--Artem K8S % kubectl apply -f fault-tolerant-job.yaml
job.batch/fault-tolerant-job created
ptashko@MacBook-Air--Artem K8S % kubectl get pods --selector=job-name=fault-tolerant-job | wc -l
      2
ptashko@MacBook-Air--Artem K8S % kubectl describe job fault-tolerant-job
Name:            fault-tolerant-job
Namespace:       default
Selector:        batch.kubernetes.io/controller-uid=6868b843-e0e6-4e0d-a0e2-2859205b302d
Labels:          batch.kubernetes.io/controller-uid=6868b843-e0e6-4e0d-a0e2-2859205b302d
                 batch.kubernetes.io/job-name=fault-tolerant-job
                 controller-uid=6868b843-e0e6-4e0d-a0e2-2859205b302d
                 job-name=fault-tolerant-job
Annotations:     <none>
Parallelism:     1
Completions:     4
Completion Mode: NonIndexed
Suspend:         false
Backoff Limit:   4
Start Time:      Thu, 13 Nov 2025 16:14:24 +0300
Pods Statuses:   1 Active (0 Ready) / 0 Succeeded / 0 Failed
Pod Template:
  Labels:  batch.kubernetes.io/controller-uid=6868b843-e0e6-4e0d-a0e2-2859205b302d
           batch.kubernetes.io/job-name=fault-tolerant-job
           controller-uid=6868b843-e0e6-4e0d-a0e2-2859205b302d
           job-name=fault-tolerant-job
  Containers:
   worker:
    Image:      nginx:latest
    Port:       <none>
    Host Port:  <none>
    Command:
      /bin/sh
      -c
      RANDOM_NUMBER=$RANDOM
      if [ $(( $RANDOM_NUMBER % 2 )) -eq 0];
      then
        exit 0
      else
        exit 1
      fi

    Environment:    <none>
    Mounts:         <none>
  Volumes:          <none>
  Node-Selectors:   <none>
  Tolerations:      <none>
Events:
  Type    Reason          Age    From           Message
  ----    ------          ----   ----           -------
  Normal  SuccessfulCreate  29s  job-controller  Created pod: fault-tolerant-job-hgdjl
```

Задание 4.

```
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apiVersion: batch/v1
kind: Job
metadata:
  name: problematic-job
spec:
  completions: 2
  backoffLimit: 1
  template:
    spec:
      containers:
      - name: worker
        image: nginx:latest
        command: ['/bin/sh', '-c', 'exit 1']
        restartPolicy: OnFailure
```

```
ptashko@MacBook-Air--Artem K8S % kubectl logs job/problematic-job




^C
ptashko@MacBook-Air--Artem K8S %
```

```
ptashko@MacBook-Air--Artem K8S % kubectl describe job problematic-job
Name:            problematic-job
Namespace:       default
Selector:        batch.kubernetes.io/controller-uid=d7bfd58a-0ad2-4034-a570-2121ebae8841
Labels:          batch.kubernetes.io/controller-uid=d7bfd58a-0ad2-4034-a570-2121ebae8841
                 batch.kubernetes.io/job-name=problematic-job
                 controller-uid=d7bfd58a-0ad2-4034-a570-2121ebae8841
                 job-name=problematic-job
Annotations:     <none>
Parallelism:     1
Completions:     2
Completion Mode: NonIndexed
Suspend:         false
Backoff Limit:   1
Start Time:      Thu, 13 Nov 2025 16:23:11 +0300
Pods Statuses:   0 Active (0 Ready) / 0 Succeeded / 1 Failed
Pod Template:
  Labels:  batch.kubernetes.io/controller-uid=d7bfd58a-0ad2-4034-a570-2121ebae8841
           batch.kubernetes.io/job-name=problematic-job
           controller-uid=d7bfd58a-0ad2-4034-a570-2121ebae8841
           job-name=problematic-job
  Containers:
   worker:
    Image:      nginx:latest
    Port:       <none>
    Host Port:  <none>
    Command:
      /bin/sh
      -c
      exit 1
    Environment:  <none>
    Mounts:       <none>
  Volumes:        <none>
  Node-Selectors: <none>
  Tolerations:    <none>
Events:
  Type     Reason               Age    From          Message
  ----     ------               ----   ----          -------
  Normal   SuccessfulCreate     34s    job-controller  Created pod: problematic-job-pbcp2
  Normal   SuccessfulDelete     26s    job-controller  Deleted pod: problematic-job-pbcp2
  Warning  BackoffLimitExceeded 24s    job-controller  Job has reached the specified backoff limit
ptashko@MacBook-Air--Artem K8S % kubectl get events --field-selector involvedObject.name=problematic-job
LAST SEEN   TYPE      REASON                OBJECT                MESSAGE
40s         Normal    SuccessfulCreate      job/problematic-job   Created pod: problematic-job-pbcp2
32s         Normal    SuccessfulDelete      job/problematic-job   Deleted pod: problematic-job-pbcp2
30s         Warning   BackoffLimitExceeded  job/problematic-job   Job has reached the specified backoff limit
```

Контрольные вопросы.

В чем основное отличие Job от Deployment?
Ответ: Job используется для одноразовых операций, а Deployment - для долгосрочной поддержки.

Какие значения restartPolicy допустимы для Job и в чем их разница?
Ответ: Never - гарантия, что после успешного выполнения Pod не перезапустится; OnFailure - перезапуск Pod'а при ошибках.

Что происходит с Pod'ами после успешного завершения Job?
Ответ: Pod переходит в состояние Completed, потом удаляется.

Как параметр backoffLimit влияет на поведение Job при ошибках?
Ответ: устанавливает максимальное количество перезапусков, прежде чем Job получит статус - Failed.

В чем разница между parallelism и completions?
Ответ: completions задает общее количество успешных выполнений, а parallelism - ограничивает количество одновременно работающих Pod'ов.

Как можно посмотреть логи завершенной Job?
Ответ: kubectl logs <pod-name> (--previous если под перезапускался).

Что произойдет, если Job превысит установленный backoffLimit?
Ответ: установится статус Failed и созданные ею Pod'ы удалятся.

Какие команды вы бы использовали для диагностики проблем с Job?
Ответ: команды для Pod'ов и Job с get'ами, describ'ами и logs.