QUESTIONS

Normal

1. Describe Git branching strategies (Git-flow, single branch, feature branch etc.) which you have used and what purpose does it serves.
   I recently used feature branch. feature branch is like a version of our code that add new feature or fixed bug of our application
2. How do you revert a commit that has already been pushed and made public?
   I used git revert <commit id> to the old commit I want to undo then push again.
3. How do you normally solve conflicts in a feature branch before merge?
   compare the change of code and choose the code version I want to merge
4. “200 OK” what does it mean and show use case this HTTP Status?
   user request is successfully executed and response by backend
   GET: The resource has been fetched and is transmitted in the message body.
5. “201 Created” what does it mean and show use case this HTTP Status?
   The new resource is effectively created before this response is sent back and the new resource is returned in the body of the message.
6. “301 Moved Permanently” what does it mean and show use case this HTTP Status?

7. “400 Bad Request” what does it mean and how to identify the problem?
   request from client is wrong or error such as wrong syntax
8. “401 Unauthorized” what does it mean and how to identify the problem?
   request lacks valid authentication credentials for the target resource.
9. “403 Forbidden” what does it mean and how to identify the problem?
   client error status response that the server understood the request but refuses to authorize it. Example CSRF
10. “404 Not Found” what does it mean and how to identify the problem?
    server can't find the requested resource
11. “500 Internal Server Error” what does it mean and how to identify the problem?
    server encountered an unexpected condition that prevented it from fulfilling the request
12. “502 Bad Gateway” what does it mean and how to identify the problem?
    the server, while acting as a gateway or proxy, received an invalid response from the upstream server
13. “503 Service Unavailable” what does it mean and how to identify the problem?
    the server is not ready to handle the request.
14. “504 Gateway Timeout” what does it mean and how to identify the problem?
    the server, while acting as a gateway or proxy, did not get a response in time from the upstream server that it needed in order to complete the request.

15. What are Linux network tools do you use for troubleshooting network problems as well as usage scenarios for each tool?

Intermediate

1. Assume we have an application that is designed as below. Our application stopped responding due to an extremely high number of clients in some circumstances.
- We have tried scaling a number of API Gateway and Service A nodes but it didn't help. What are the possible problems that lies in our system in which components and how to fix them?
   problem : Server is overload from too many user requests
   Solution : Use load balancer or Separate handler function as microservices
2. How do you keep the docker image smallest as possible?
   use necessary files and dependences for application for creating docker file
3. What is the difference between overlay, bridge, host network in Docker? When to use each of them?
4. How does the Kubernetes service talk to each other in the same cluster?
5. What's different between L2, L4, and L7 Load balancers? When to use it?

Professional

1. Assume that you are using a private cloud for your infrastructure. How do you manage logs, metrics, and alerts for your infrastructure and applications? Which tools do you use and why?
2. How do you secure the following?
   - application : use csrf with form or write protect route middleware
   - infrastructure
   - data : encrypt data before save to database

3. Base on your experience, how do you reduce your service downtime as much as possible during
   - software upgrade : use aws auto scaling service
   - database migration
   - incident
4. Configuration management

    a. Which Among Puppet, chef, Ansible, or another is the best Configuration management tool?
    b. Why?
    c. Do you still need to use it if you already have docker-swarm or Kubernetes?
5. How do you design your Kubernetes cluster? what DNS, CNI, ingression is being used? Why?
6. How do you measure service quality to give the best experience to your customer? (SLO, SLA)

Hands-On

1. Please build and deploy your application of choice using Kubernetes. It should support multiple environments (e.g. beta, prod).

The solution must include the following

- Architecture Diagram
- Dockerfile or Buildpacks supports the following languages:
  - .Net Core
  - Go
  - Java
  - Node
  - Rust

CI/CD pipeline file:

- You can choose your CI/CD tool:
  - Gitlab CI
  - Github Actions
  - CircleCI
  - Jenkins
  - Travis CI
  - GoCD
  - BitBucket
  - Azure DevOps
- Kubernetes Manifests
- Kubernetes Ingress Configuration

Please update README for steps how to test, build, deploy and run the application using Kubernetes

Algorithms

Choose your favorite language (Rust would be advantages) to solve the following challenges:

1. FizzBuzz...But: You may heard the FizzBuzz task. Here we have the same rule. You will write a function fizzBuzz that receive a single parameter it will return the value base on these rule.

- If the input is divisible by 3, return 'Fizz'
- If the input is divisible by 5, return 'Buzz'
- If the input is divisible by both 3 and 5, return 'FizzBuzz'

BUT we're not allow you to use if/else statement. If there is any if or else word in your code. I will consider this question with 0 scores :(

Example

```
> fizzBuzz(21)
Fizz

> fizzBuzz(25)
Buzz

> fizzBuzz(45)
FizzBuzz
```

2. Bob has a server farm crunching numbers. He has nodes servers in his farm. His company has a lot of work to do. The work comes as a number workload which indicates how many jobs there are. Bob wants his servers to get an equal number of jobs each. If that is impossible, he wants the first servers to receive more jobs. He also wants the jobs sorted, so that the first server receives the first jobs. The way this works, Bob wants an array indicating which jobs are going to which servers.
Can you help him distribute all this work as evenly as possible onto his servers?

Example

Bob has 2 servers and 4 jobs. The first server should receive job 0 and 1 while the second should receive 2 and 3.

distribute(2, 4) # => [[0, 1], [2, 3]]

On a different occasion Bob has 3 servers and 3 jobs. Each should get just one.

distribute(3, 3) # => [[0], [1], [2]]

A couple of days go by and Bob sees a spike in jobs. Now there are 10, but he hasn't got more than 4 servers available. He boots all of them. This time the first and second should get a job more than the third and fourth.

distribute(4, 10) # => [[0, 1, 2], [3, 4, 5], [6, 7], [8, 9]]
distribute(3, 8) # => [[0, 1, 2], [3, 4, 5], [6, 7]]

3. It's tricky keeping track of who is owed what when spending money in a group. Write a function to balance the books.

- The function should take one parameter: a dict with two or more name-value pairs which represent the members of the group and the amount spent by each.
- The function should return a dict with the same names, showing how much money the members should pay or receive.

Further points:

- The values should be positive numbers if the person should receive money from the group, negative numbers if they owe money to the group.
- If value is a decimal, round to two decimal places.

Example:
3 friends go out together: A spends $20, B spends $15, and C spends $10. The function should return an object/dict showing that A should receive $5, B should receive $0, and C should pay $5.

```
var group = {
   A: 20,
   B: 15,
   C: 10
}

splitTheBill(group) // returns {A: 5, B: 0, C: -5}
```

4. Fibonacci

The Fibonacci numbers are the numbers in the following integer sequence.

0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144, ……..

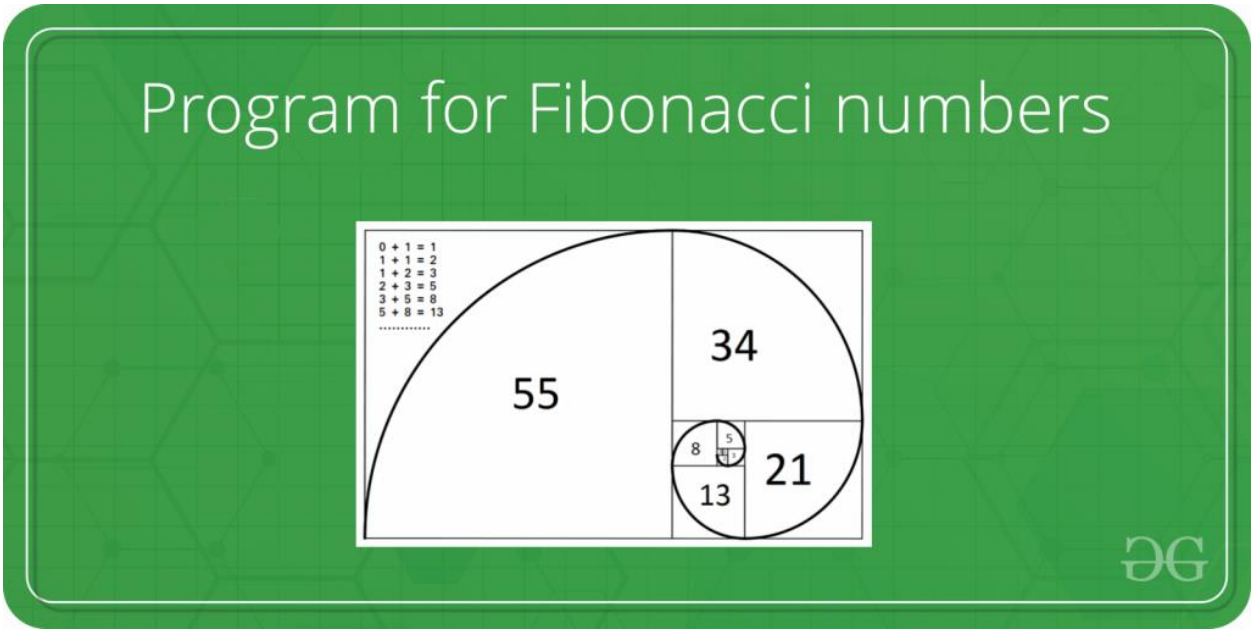
In mathematical terms, the sequence Fn of Fibonacci numbers is defined by the recurrence relation

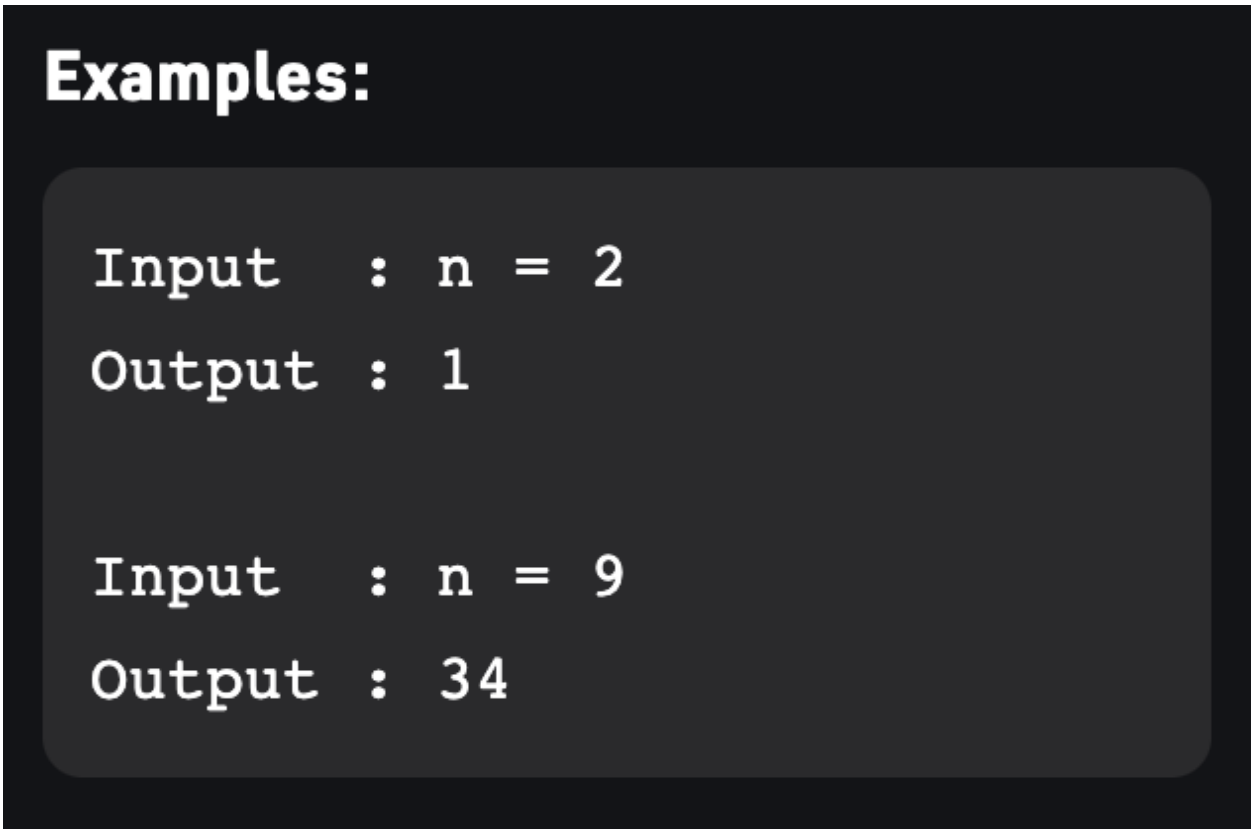
$F_n = F_{n-1} + F_{n-2}$

with seed values

$F_0 = 0$ and $F_1 = 1$.

Given a number n, print n-th Fibonacci Number.





5. Palindrome

Given a string, write a function to check if it is palindrome or not.

In case: even you can reverse the string

In case: odd you should use the middle to split the word and then reverse the string

A string is said to be palindrome if the reverse of the string is the same as the string. For example, “abba” is Palindrome, but “abbc” is not Palindrome.

Anna, civic, kayak, level, madam, mom, noon, racecar, radar, redder, refer, repaper, rotator, 12321, 15651

Output format on Github

kubeops-part-time

|-> README.md

|-> hand-on

    |-> h01

    |-> h02

    |-> h03

|-> algorithms

    |-> a01

    |-> a02