Step 1: Create a instance
Setting the billing account:

Set the billing account for project "My MapReduce Project"

Please select a **Google Cloud Platform** billing account to support this project. Some billing accounts may not be available. Learn more

Billing account *
My Billing Account

Any charges for this project will be billed to the account you select here.

CANCEL   **SET ACCOUNT**

Create an Instance

← Create an instance

To create a VM instance, select one of the options:

New VM instance
Create a single VM instance from scratch

New VM instance from template
Create a single VM instance from an existing template

New VM instance from machine image
Create a single VM instance from an existing machine image

Marketplace
Deploy a ready-to-go solution onto a VM instance

Name *
instance-2

Labels
+ ADD LABELS

Region *   Zone *
us-west1 (Oregon)   us-west1-a
Region is permanent   Zone is permanent

Machine configuration

Machine family

GENERAL-PURPOSE   COMPUTE-OPTIMIZED   MEMORY-OPTIMIZED   GPU

Machine types for common workloads, optimized for cost and flexibility

Series
E2
CPU platform selection based on availability

Machine type
e2-small (2 vCPU, 2 GB memory)

	vCPU	Memory
	0.5-2 vCPU (1 shared core)	2 GB

CPU PLATFORM AND GPU

Change Boot Disk:

Set firewall:

Create an instance

Back to Instances list page elect one of the options:

New VM instance
Create a single VM instance from scratch

New VM instance from template
Create a single VM instance from an existing template

New VM instance from machine image
Create a single VM instance from an existing machine image

Marketplace
Deploy a ready-to-go solution onto a VM instance

CHANGE

Identity and API access ?

Service accounts ?

Service account
Compute Engine default service account

Requires the Service Account User role (roles/iam.serviceAccountUser) to be set for users who want to access VMs with this service account. Learn more

Access scopes ?
○ Allow default access
○ Allow full access to all Cloud APIs
○ Set access for each API

Firewall ?

Add tags and firewall rules to allow specific network traffic from the Internet
☑ Allow HTTP traffic
☑ Allow HTTPS traffic

Advanced options
Networking, disks, security, management, sole-tenancy

Your free trial credit will be used for this VM instance. Google Cloud Free Tier

CREATE   CANCEL   EQUIVALENT COMMAND LINE

Compute Engine

VM instances   CREATE INSTANCE   IMPORT VM   REFRESH   OPERATIONS   HELP ASSISTANT   SHOW INFO PANEL

Virtual machines
- VM instances
- Instance templates
- Sole-tenant nodes
- Machine images
- TPUs
- Committed use discounts
- Migrate to Virtual Machin...

Storage
- Disks
- Snapshots
- Images

Instance groups
- Marketplace

INSTANCES   INSTANCE SCHEDULES

ⓘ Get better visibility into your VMs by installing Ops Agent - aggregate logs and metrics in one place. Learn more

VM instances are highly configurable virtual machines for running workloads on Google infrastructure. Learn more

Filter   Enter property name or value

	Status	Name ↑	Zone	Recommendations	In use by	Internal IP	External IP	Connect
☐	◯	instance-1	us-central1-a			10.128.0.2 (nic0)		SSH ▾
☐	✓	instance-2	us-west1-a			10.138.0.2 (nic0)	34.105.31.213 ☑ (nic0)	SSH ▾

Start / Resume
Stop
Suspend
Reset
Delete
View network details
Create new machine i
View logs

Related actions

Explore Backup and DR NEW
Back up your VMs and set up disaster recovery

View billing report
View and manage your Compute Engine billing

Monitor VMs
View outlier VMs across metrics like CPU and network

Explore VM lo
View, search, analyze, instance logs

Set up firewall rules
Control traffic to and from a VM instance

Patch management
Schedule patch updates and view patch compliance on VM instances

Install Java
rpan@instance-2:~$ sudo apt-get update

https://ssh.cloud.google.com/v2/ssh/projects/my-mapreduce-project-367604/zones/us-west1-a/instances/instance-2?authuser=0&hl=en_... — ☐

🔒 ssh.cloud.google.com/v2/ssh/projects/my-mapreduce-project-367604/zones/us-west1-a/instances/instance-2?authuser=0&hl=en_US&...

SSH-in-browser   ⬆ UPLOAD FILE   ⬇ DOWNLOAD FILE   ❗   ⌨   ⚙

```
Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.

rpan@instance-2:~$ ls
rpan@instance-2:~$ sudo apt-get update
Hit:1 http://us-west1.gce.archive.ubuntu.com/ubuntu bionic InRelease
Get:2 http://us-west1.gce.archive.ubuntu.com/ubuntu bionic-updates InRelease [88.7 kB]
Get:3 http://us-west1.gce.archive.ubuntu.com/ubuntu bionic-backports InRelease [83.3 kB]
Get:4 http://security.ubuntu.com/ubuntu bionic-security InRelease [88.7 kB]
Get:5 http://us-west1.gce.archive.ubuntu.com/ubuntu bionic/universe amd64 Packages [8570 kB]
Get:6 http://us-west1.gce.archive.ubuntu.com/ubuntu bionic/universe Translation-en [4941 kB]
Get:7 http://us-west1.gce.archive.ubuntu.com/ubuntu bionic/multiverse amd64 Packages [151 kB]
Get:8 http://us-west1.gce.archive.ubuntu.com/ubuntu bionic/multiverse Translation-en [108 kB]
Get:9 http://us-west1.gce.archive.ubuntu.com/ubuntu bionic-updates/main amd64 Packages [2807 kB]
Get:10 http://us-west1.gce.archive.ubuntu.com/ubuntu bionic-updates/main Translation-en [516 kB]
Get:11 http://us-west1.gce.archive.ubuntu.com/ubuntu bionic-updates/restricted amd64 Packages [1013 kB]
Get:12 http://us-west1.gce.archive.ubuntu.com/ubuntu bionic-updates/restricted Translation-en [140 kB]
Get:13 http://us-west1.gce.archive.ubuntu.com/ubuntu bionic-updates/universe amd64 Packages [1858 kB]
Get:14 http://us-west1.gce.archive.ubuntu.com/ubuntu bionic-updates/universe Translation-en [402 kB]
Get:15 http://us-west1.gce.archive.ubuntu.com/ubuntu bionic-updates/multiverse amd64 Packages [24.9 kB]
Get:16 http://us-west1.gce.archive.ubuntu.com/ubuntu bionic-updates/multiverse Translation-en [6012 B]
Get:17 http://us-west1.gce.archive.ubuntu.com/ubuntu bionic-backports/main amd64 Packages [53.3 kB]
Get:18 http://us-west1.gce.archive.ubuntu.com/ubuntu bionic-backports/main Translation-en [14.6 kB]
Get:19 http://us-west1.gce.archive.ubuntu.com/ubuntu bionic-backports/universe amd64 Packages [18.1 kB]
Get:20 http://security.ubuntu.com/ubuntu bionic-security/main amd64 Packages [2470 kB]
Get:21 http://us-west1.gce.archive.ubuntu.com/ubuntu bionic-backports/universe Translation-en [8668 B]
Get:22 http://security.ubuntu.com/ubuntu bionic-security/main Translation-en [428 kB]
Get:23 http://security.ubuntu.com/ubuntu bionic-security/restricted amd64 Packages [983 kB]
Get:24 http://security.ubuntu.com/ubuntu bionic-security/restricted Translation-en [136 kB]
Get:25 http://security.ubuntu.com/ubuntu bionic-security/universe amd64 Packages [1245 kB]
Get:26 http://security.ubuntu.com/ubuntu bionic-security/universe Translation-en [286 kB]
Get:27 http://security.ubuntu.com/ubuntu bionic-security/multiverse amd64 Packages [19.0 kB]
Get:28 http://security.ubuntu.com/ubuntu bionic-security/multiverse Translation-en [3836 B]
Fetched 26.5 MB in 5s (4870 kB/s)
Reading package lists... Done
rpan@instance-2:~$ []
```

$ sudo apt-get install openjdk-8-jdk

```
rpan@instance-2:~$ java -version
openjdk version "1.8.0_352"
OpenJDK Runtime Environment (build 1.8.0_352-8u352-ga-1~18.04-b08)
OpenJDK 64-Bit Server VM (build 25.352-b08, mixed mode)
rpan@instance-2:~$ []
```

Check if ssh/sshd/pdsh exists already, if not, install them:
$ which ssh
$ which sshd
$ which pdsh
Install ssh & pdsh:
$ sudo apt-get install ssh
$ sudo apt-get install pdsh

Download Hadoop 3.3.4, and unpack them.
$ wget https://dlcdn.apache.org/hadoop/common/hadoop-3.3.4/hadoop-3.3.4.tar.gz
$ tar xvzf hadoop-3.3.4.tar.gz

Set java path for Hadoop:
$ cd hadoop-3.3.4/
$ vi etc/Hadoop/hadoop-env.sh
Add " export JAVA_HOME=/usr/lib/jvm/java-8-openjdk-amd64/jre/bin/java"

Set other path/variables for Hadoop
$ vi ~/.bashrc
Add the following lines:
export JAVA_HOME=/usr/lib/jvm/java-8-openjdk-amd64/jre/bin/java
export PDSH_RCMD_TYPE=ssh
export PATH=${JAVA_HOME}/bin:${PATH}
export HADOOP_CLASSPATH=${JAVA_HOME}/lib/tools.jar
$ source ~/.bashrc

Test the Hadoop command:
$ bin/Hadoop
This will display the usage documentation for the Hadoop script if Hadoop is installed
successfully.

Prepare input data

$ mkdir PiCalculation
$ cd PiCalculation
$ vi GenerateRandomNumbers.java
$ javac GenerateRandomNumbers.java
$ java -cp . GenerateRandomNumbers

```
rpan@instance-2:~/hadoop-3.3.4$ vim PiCalculation
rpan@instance-2:~/hadoop-3.3.4$ vim PiCalculation.java
rpan@instance-2:~/hadoop-3.3.4$ cd ..
rpan@instance-2:~$ cd PiCalculation
rpan@instance-2:~/PiCalculation$ ls
GenerateRandomNumbers.class   GenerateRandomNumbers.java   PiCalculationInput
rpan@instance-2:~/PiCalculation$
```

```java
import java.io.File;
import java.io.FileWriter;
import java.io.IOException;
import java.util.Scanner;

public class GenerateRandomNumbers {
    public static void main(String[] args) {
        System.out.println("How many random numbers to generate:");   // we use 1000000 to test
        Scanner input = new Scanner(System.in);
        int RandomNumCount = input.nextInt();

        System.out.println("What's the radius?");   //we use 200 to test
        int radius = input.nextInt();
        int diameter = radius * 2;
        input.close();

        try {

            // it creates file input4
            File file = new File("./PiCalculationInput");
            file.createNewFile();

            // Prepare input data
            FileWriter writer = new FileWriter(file);
            //writer.write(radius + "\r\n");
            //writer.write(System.getProperty("line.separator"));

            for (int i = 0; i < RandomNumCount; i++) {
                int xvalue = (int) (Math.random() * diameter);
                int yvalue = (int) (Math.random() * diameter);
                writer.write("(" + xvalue + "," + yvalue + ") ");
            }

            // send the data into the file
            writer.flush();

            // closing the write after pushing the data inside the .txt file
            writer.close();
        } catch (IOException e) {
            e.printStackTrace();
        }
    }
}

        BufferedReader br = new BufferedReader(new InputStreamReader(fs.open(path)));

        String z, inside = null, outside = null;

        String line1, line2;

        line1 = br.readLine();
        System.out.println(line1);
        line2 = br.readLine();
        System.out.println(line2);

        line1 = line1.replace("inside", "").trim();
        line2 = line2.replace("outside", "").trim();

        System.out.println("Inside:" + line1 + ", Outside:" + line2);

        if (line1 != null && line2 != null) {
            double invalue = Double.valueOf(line1);
            double outvalue = Double.valueOf(line2);
            double pi = 4 * (invalue / (invalue + outvalue));
            System.out.println("PI:" + pi);
        }

        fs.close();
    }
```

```
                                                          95,0-1          98%
```

(54,393) (25,177) (146,179) (171,53) (366,252) (341,274) (70,297) (145,84) (395,399) (183,281) (8,0) (49,61) (5,399) (308,179) (293,70) (91,78) (379,189) (329,196) (214,159) (243,359) (12,367) (192,94) (282,302) (319,80) (55,173) (240,214) (340,365) (82,87) (140,385) (104,55) (97,125) (313,304) (292,64) (379,248) (356,344) (201,347) (263,186) (321,261) (103,137) (176,352) (93,92) (106,319) (325,9) (171,319) (235,381) (313,80) (345,46) (203,381) (52,394) (162,331) (111,44) (277,119) (8,107) (151,56) (43,50) (292,304) (180,373) (51,149) (94,315) (397,206) (205,348) (92,30 3) (183,124) (189,47) (283,225) (91,168) (301,295) (269,331) (157,322) (160,298) (224,233) (359,244) (297,40) (357,179) (135,110) (28,234) (391,341) (297,269) (307,67) (96,384) (385,268) (302, 329) (116,11) (121,282) (178,140) (102,381) (375,94) (265,195) (191,162) (62,378) (229,60) (332,258) (344,75) (355,312) (5,131) (73,82) (247,385) (46,250) (280,237) (153,92) (331,196) (119,227) (334,40) (78,3) (143,392) (202,79) 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(391,46) (172,28) (340,1) (161,147) (38,251) (92,66) (41,220) (318,184) (195,53) (319,71) (264,242) (288,137) (88,200) (27,360) (331,279) (378,147) (103,286) (127,185) (39,318) (197,273) (195,14) (197,111) (287,66) (372,66) (168,171) (397,385) (88,295) (348,318) (176,221) (301,6) (185,314) (44,220) (329,283) (219,188) (392,23) (369,105) (377,174) (313,159) (278,255) (183,35) (125,323) (101,209) (118,63) (124,168) (170,206) (248,209) (329,65) (251,196) (220,110) (227,295) (106,292) (162,377) (357,104) (364,121) (96,273) (304, 50) (339,187) (48,15) (7,375) (153,365) (82,112) (1,211) (184,350) (187,105) (213,259) (215,90) (285,309) (300,348) (57,247) (41,229) (243,250) (218,226) (125,42) (230,164) (77,36) (337,147) (284,119) (16,79) (334,375) (353,127) (68,337) (44,327) (309,328) (311,199) (100,329) (34,388) (48,389) (32,353) (112,124) (175,181) (265,341) (148,363) (312,305) (149,322) (383,165) (110,365) (179,273) (172,52) (225,40) (195,330) (58,122) (160,38) (181,375) (271,313) (221,79) (0,145) (351,93) (155,213) (162,19) (38,398) (119,310) (121,313) (209,16) (163,245) (34,238) (193,353) (5,2 33) (395,110) (63,247) (170,206) (134,111) (364,167) (301,316) (36,97) (91,164) (379,127) (376,202) (91,30) (206,139) (88,348) (273,178) (250,191) (152,250) (4,285) (181,43) (65,168) (272,237) (126,380) (295,265) (299,157) (115,370) (312,392) (393,376) (211,208) (231,141) (31,99) (346,124) (169,16) (370,354) (94,1) (290,290) (66,38) (101,213) (74,350) (98,128) (5,272) (97 ,353) (78,144) (302,346) (78,46) (99,270) (302,329) (377,219) (55,298) (324,71) (147,48) (161,243) (331,109) (110,183) (368,339) (350,81) (191,87) (293,353) (367,143) (255,216) (303,111) (120, 291) (137,259) (285,261) (18,133) (377,320) (82,186) (280,196) (144,16) (140,172) (34,84) (153,67) (359,93) (243,126) (86,168) (175,237) (144,222) (253,393) (363,1) (366,313) (199,35) (247,363) (150,189) (118,235) (210,342) (398,215) (95,324) (105,266) (146,200) (251,305) (113,312) (224,346) (346,199) (89,234) (106,305) (219,179) (182,282) (91,5) (323,182) (112,290) (345,45) (264,1 78) (276,10) (119,29) (344,34) (260,31) (40,211) (163,166) (85,197) (262,36) (247,273) (51,245) (91,190) (236,252) (0,141) (257,147) (240,302) (148,346) (36,113) (145,229) (196,309) (237,262) (131,375) (194,81) (390,9) (149,218) (308,223) (55,79) (137,142) (208,64) (228,276) (398,377) (345,71) (244,105) (108,338) (181,101) (397,309) (248,380) (188,35) (303,0) (72,65) (74,325) (245, 254) (268,321) (272,112) (261,20) (3,320) (223,150) (35,133) (188,321) (138,343) (396,191) (189,257) (244,96) (107,277) (103,237) (139,139) (20,68) (323,111) (145,285) (331,296) (208,72) (288, 122) (156,359) (286,52) (7,230) (13,250) (146,200) (165,200) (333,267) (146,86) (377,71) (331,147) (27,53) (315,346) (221,47) (286,236) (352,202) (123,337) (348,43) (52,22) (381,16) (107,61) (
"PiCalculationInput" [noeol] 1L, 945185C   1,1   All

```java
    public static void main(String[] args) throws Exception {
        Configuration conf = new Configuration();
        Job job = Job.getInstance(conf, "pi calculation");
        job.setJarByClass(PiCalculation.class);
        job.setMapperClass(TokenizerMapper.class);
        job.setCombinerClass(IntSumReducer.class);
        job.setReducerClass(IntSumReducer.class);
        job.setOutputKeyClass(Text.class);
        job.setOutputValueClass(IntWritable.class);
        FileInputFormat.addInputPath(job, new Path(args[0]));
        FileOutputFormat.setOutputPath(job, new Path(args[1]));
        // System.exit(job.waitForCompletion(true) ? 0 : 1);
        job.waitForCompletion(true);
        String filePath = args[1] + "/" + "part-r-00000";
        Path path = new Path(filePath);
        FileSystem fs = FileSystem.get(path.toUri(), conf);

        BufferedReader br = new BufferedReader(new InputStreamReader(fs.open(path)));
```

```
                                                                            72,0-1        73%
```

```
rpan@instance-2:~$ cd hadoop-3.3.4
rpan@instance-2:~/hadoop-3.3.4$ ls
 GenerateRandomNumbers.java           PiCalculation.java            include         logs
 LICENSE-binary                       README.txt                    index.html      output
 LICENSE.txt                         'WordCount$IntSumReducer.class' index.html.1    output1
 NOTICE-binary                       'WordCount$TokenizerMapper.class' index.html.2  sbin
 NOTICE.txt                           WordCount.class               input           share
'PiCalculation$IntSumReducer.class'   WordCount.java                lib             wc.jar
'PiCalculation$TokenizerMapper.class' bin                           libexec
 PiCalculation.class                  etc                           licenses-binary
rpan@instance-2:~/hadoop-3.3.4$ vim PiCalculation.java
rpan@instance-2:~/hadoop-3.3.4$ cd ..
rpan@instance-2:~$ cd PiCalculation
rpan@instance-2:~/PiCalculation$ vim GenerateRandomNumbers.java
rpan@instance-2:~/PiCalculation$ javac GenerateRandomNumbers.java
rpan@instance-2:~/PiCalculation$ java -cp . GenerateRandomNumbers
How many random numbers to generate:
100000
What's the radius?
200
rpan@instance-2:~/PiCalculation$ cd
```

https://ssh.cloud.google.com/v2/ssh/projects/my-mapreduce-project-367604/zones/us-west1-a/instances/instance-2?authuser=0&hl=en_... — ☐ ✕

🔒 ssh.cloud.google.com/v2/ssh/projects/my-mapreduce-project-367604/zones/us-west1-a/instances/instance-2?authuser=0&hl=en_US&...

▓ SSH-in-browser   ⬆ UPLOAD FILE   ⬇ DOWNLOAD FILE   ❗   ⌨   ⚙

```
Welcome to Ubuntu 18.04.6 LTS (GNU/Linux 5.4.0-1093-gcp x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:     https://landscape.canonical.com
 * Support:        https://ubuntu.com/advantage

  System information as of Tue Nov 29 22:24:30 UTC 2022

  System load:  0.0               Processes:             109
  Usage of /:   46.8% of 9.51GB   Users logged in:       0
  Memory usage: 22%               IP address for ens4:   10.138.0.8
  Swap usage:   0%

 * Strictly confined Kubernetes makes edge and IoT secure. Learn how MicroK8s
   just raised the bar for easy, resilient and secure K8s cluster deployment.

   https://ubuntu.com/engage/secure-kubernetes-at-the-edge

0 updates can be applied immediately.

New release '20.04.5 LTS' available.
Run 'do-release-upgrade' to upgrade to it.


Last login: Tue Nov 29 22:15:20 2022 from 35.235.244.2
rpan@instance-2:~$ cd hadoop-3.3.4
```

```
Last login: Tue Nov 29 22:15:20 2022 from 35.235.244.2
rpan@instance-2:~$ cd hadoop-3.3.4
rpan@instance-2:~/hadoop-3.3.4$ localhost
localhost: command not found
rpan@instance-2:~/hadoop-3.3.4$ ssh-keygen -t rsa -P '' -f ~/.ssh/id_rsa
Generating public/private rsa key pair.
/home/rpan/.ssh/id_rsa already exists.
Overwrite (y/n)? y
Your identification has been saved in /home/rpan/.ssh/id_rsa.
Your public key has been saved in /home/rpan/.ssh/id_rsa.pub.
The key fingerprint is:
SHA256:o1E8IsD+iUDo7hyVYgjbVvD42cJqsKtDkzBrz94s0Oc rpan@instance-2
The key's randomart image is:
+---[RSA 2048]----+
|..o.             |
|o..+.   .        |
|=+..+ . +        |
|*++= + o .       |
|===o=.o S        |
|.@.ooo o .       |
|* O o .          |
|.= +oE           |
|+....o           |
+----[SHA256]-----+
rpan@instance-2:~/hadoop-3.3.4$ cat ~/.ssh/id_rsa.pub >> ~/.ssh/authorized_keys
```

```
rpan@instance-2:~/hadoop-3.3.4$ cat ~/.ssh/id_rsa.pub >> ~/.ssh/authorized_keys
rpan@instance-2:~/hadoop-3.3.4$ chmod 0600 ~/.ssh/authorized_keys
rpan@instance-2:~/hadoop-3.3.4$ ssh localhost
Welcome to Ubuntu 18.04.6 LTS (GNU/Linux 5.4.0-1093-gcp x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:     https://landscape.canonical.com
 * Support:        https://ubuntu.com/advantage

  System information as of Tue Nov 29 22:26:28 UTC 2022

  System load:  0.0               Processes:             113
  Usage of /:   46.8% of 9.51GB   Users logged in:       1
  Memory usage: 22%               IP address for ens4:   10.138.0.8
  Swap usage:   0%

 * Strictly confined Kubernetes makes edge and IoT secure. Learn how MicroK8s
   just raised the bar for easy, resilient and secure K8s cluster deployment.

   https://ubuntu.com/engage/secure-kubernetes-at-the-edge

0 updates can be applied immediately.

New release '20.04.5 LTS' available.
Run 'do-release-upgrade' to upgrade to it.
```

```
rpan@instance-2:~$ cd hadoop-3.3.4
rpan@instance-2:~/hadoop-3.3.4$ ls
 GenerateRandomNumbers.java             PiCalculation.java                   include          logs
 LICENSE-binary                         README.txt                          index.html        output
 LICENSE.txt                           'WordCount$IntSumReducer.class'      index.html.1      output1
 NOTICE-binary                         'WordCount$TokenizerMapper.class'    index.html.2      sbin
 NOTICE.txt                             WordCount.class                     input            share
'PiCalculation$IntSumReducer.class'     WordCount.java                      lib              wc.jar
'PiCalculation$TokenizerMapper.class'   bin                                libexec
 PiCalculation.class                    etc                                licenses-binary
rpan@instance-2:~/hadoop-3.3.4$ vim PiCalculation.java
rpan@instance-2:~/hadoop-3.3.4$ cd ..
rpan@instance-2:~$ cd PiCalculation
rpan@instance-2:~/PiCalculation$ vim GenerateRandomNumbers.java
rpan@instance-2:~/PiCalculation$ javac GenerateRandomNumbers.java
rpan@instance-2:~/PiCalculation$ java -cp . GenerateRandomNumbers
How many random numbers to generate:
100000
What's the radius?
200
```

```
rpan@instance-2:~/PiCalculation$ cd ^C
rpan@instance-2:~/PiCalculation$ cd ..
rpan@instance-2:~$ cd hadoop-3.3.4
rpan@instance-2:~/hadoop-3.3.4$ bin/hdfs namenode -format
namenode is running as process 4826.  Stop it first and ensure /tmp/hadoop-rpan-namenode.pid file is empty befo
re retry.
rpan@instance-2:~/hadoop-3.3.4$ bin/hdfs namenode -format
namenode is running as process 4826.  Stop it first and ensure /tmp/hadoop-rpan-namenode.pid file is empty befo
re retry.
rpan@instance-2:~/hadoop-3.3.4$ wget http://localhost:9870/
--2022-11-29 22:36:05--  http://localhost:9870/
Resolving localhost (localhost)... 127.0.0.1
Connecting to localhost (localhost)|127.0.0.1|:9870... connected.
HTTP request sent, awaiting response... 302 Found
Location: http://localhost:9870/index.html [following]
--2022-11-29 22:36:05--  http://localhost:9870/index.html
Reusing existing connection to localhost:9870.
HTTP request sent, awaiting response... 200 OK
Length: 1079 (1.1K) [text/html]
Saving to: 'index.html.3'

index.html.3          100%[===================================>]   1.05K  --.-KB/s    in 0s

2022-11-29 22:36:05 (147 MB/s) - 'index.html.3' saved [1079/1079]
```

```
rpan@instance-2:~/hadoop-3.3.4$ bin/hdfs dfs -mkdir /user
mkdir: `/user': File exists
rpan@instance-2:~/hadoop-3.3.4$ ls bin/hdfs dfs /user/rpan
ls: cannot access 'dfs': No such file or directory
ls: cannot access '/user/rpan': No such file or directory
bin/hdfs
rpan@instance-2:~/hadoop-3.3.4$ ls bin/hdfs dfs mkdir /user/rpan
ls: cannot access 'dfs': No such file or directory
ls: cannot access 'mkdir': No such file or directory
ls: cannot access '/user/rpan': No such file or directory
bin/hdfs
rpan@instance-2:~/hadoop-3.3.4$ ls bin/hdfs dfs -mkdir /user/rpan
ls: cannot access 'dfs': No such file or directory
ls: cannot access '/user/rpan': No such file or directory
516296 bin/hdfs
rpan@instance-2:~/hadoop-3.3.4$ bin/hdfs dfs -mkdir /user/rpan
mkdir: `/user/rpan': File exists
rpan@instance-2:~/hadoop-3.3.4$ bin/hdfs dfs -mkdir /user/rpan/picalculate
rpan@instance-2:~/hadoop-3.3.4$ bin/hdfs dfs -mkdir /user/rpan/picalculate/input
rpan@instance-2:~/hadoop-3.3.4$ bin/hdfs dfs -put ../PiCalculation/PiCalculationInput user/rpan/picalculate/inp
ut
put: `user/rpan/picalculate/input': No such file or directory: `hdfs://localhost:9000/user/rpan/user/rpan/pical
```

```
rpan@instance-2:~/hadoop-3.3.4$ bin/hdfs dfs -put ../PiCalculation/PiCalculationInput user/rpan/picalculate/inp
ut
put: `user/rpan/picalculate/input': No such file or directory: `hdfs://localhost:9000/user/rpan/user/rpan/pical
culate/input'
rpan@instance-2:~/hadoop-3.3.4$ bin/hdfs dfs -put ../PiCalculation/PiCalculationInput /user/rpan/picalculate/in
put
rpan@instance-2:~/hadoop-3.3.4$ bin/hadoop com.sun.tools.javac.Main PiCalculation.java
rpan@instance-2:~/hadoop-3.3.4$ jar cf wc.jar PiCalculation*class
rpan@instance-2:~/hadoop-3.3.4$ bin/hadoop jar wc.jar PiCalculation /user/rpan/picalculate/input /user/rpan/pic
alculate/output4
2022-11-29 22:44:48,492 INFO impl.MetricsConfig: Loaded properties from hadoop-metrics2.properties
2022-11-29 22:44:48,626 INFO impl.MetricsSystemImpl: Scheduled Metric snapshot period at 10 second(s).
2022-11-29 22:44:48,627 INFO impl.MetricsSystemImpl: JobTracker metrics system started
2022-11-29 22:44:48,927 WARN mapreduce.JobResourceUploader: Hadoop command-line option parsing not performed. I
mplement the Tool interface and execute your application with ToolRunner to remedy this.
2022-11-29 22:44:49,127 INFO input.FileInputFormat: Total input files to process : 1
2022-11-29 22:44:49,155 INFO mapreduce.JobSubmitter: number of splits:1
2022-11-29 22:44:49,338 INFO mapreduce.JobSubmitter: Submitting tokens for job: job_local186335081_0001
2022-11-29 22:44:49,338 INFO mapreduce.JobSubmitter: Executing with tokens: []
2022-11-29 22:44:49,573 INFO mapreduce.Job: The url to track the job: http://localhost:8080/
2022-11-29 22:44:49,574 INFO mapreduce.Job: Running job: job_local186335081_0001
2022-11-29 22:44:49,585 INFO mapred.LocalJobRunner: OutputCommitter set in config null
2022-11-29 22:44:49,598 INFO output.FileOutputCommitter: File Output Committer Algorithm version is 2
2022-11-29 22:44:49,599 INFO output.FileOutputCommitter: FileOutputCommitter skip cleanup _temporary folders un
der output directory:false, ignore cleanup failures: false
2022-11-29 22:44:49,600 INFO mapred.LocalJobRunner: OutputCommitter is org.apache.hadoop.mapreduce.lib.output.F
```

```
                  Bytes Written=27
inside  78455
outside 21545
Inside:78455, Outside:21545
PI:3.1382
rpan@instance-2:~/hadoop-3.3.4$ bin/hdfs dfs -ls /user/rpan/picalculate/output4
Found 2 items
-rw-r--r--   1 rpan supergroup          0 2022-11-29 22:44 /user/rpan/picalculate/output4/_SUCCESS
-rw-r--r--   1 rpan supergroup         27 2022-11-29 22:44 /user/rpan/picalculate/output4/part-r-00000
rpan@instance-2:~/hadoop-3.3.4$ bin/hdfs dfs -cat /user/rpan/picalculate/output4/part-r-00000
inside  78455
outside 21545
rpan@instance-2:~/hadoop-3.3.4$ cd ..
rpan@instance-2:~$ cd PiCalculation
rpan@instance-2:~/PiCalculation$ javac GenerateRandomNumbers.java
rpan@instance-2:~/PiCalculation$ java -cp . GenerateRandomNumbers
How many random numbers to generate:
100000
What's the radius?
200
rpan@instance-2:~/PiCalculation$ bin/hadoop com.sun.tools.javac.Main PiCalculation.java
-bash: bin/hadoop: No such file or directory
rpan@instance-2:~/PiCalculation$ cd ..
rpan@instance-2:~$ cd hadoop-3.3.4
rpan@instance-2:~/hadoop-3.3.4$ bin/hadoop com.sun.tools.javac.Main PiCalculation.java
rpan@instance-2:~/hadoop-3.3.4$ jar cf wc.jar PiCalculation*class
```

```
rpan@instance-2:~$ cd hadoop-3.3.4
rpan@instance-2:~/hadoop-3.3.4$ bin/hadoop com.sun.tools.javac.Main PiCalculation.java
rpan@instance-2:~/hadoop-3.3.4$ jar cf wc.jar PiCalculation*class
rpan@instance-2:~/hadoop-3.3.4$ ^C
rpan@instance-2:~/hadoop-3.3.4$ bin/hadoop jar wc.jar PiCalculation /user/rpan/picalculate/input /user/rpan/pic
alculate/output4
2022-11-29 22:48:37,584 INFO impl.MetricsConfig: Loaded properties from hadoop-metrics2.properties
2022-11-29 22:48:37,711 INFO impl.MetricsSystemImpl: Scheduled Metric snapshot period at 10 second(s).
2022-11-29 22:48:37,711 INFO impl.MetricsSystemImpl: JobTracker metrics system started
Exception in thread "main" org.apache.hadoop.mapred.FileAlreadyExistsException: Output directory hdfs://localho
st:9000/user/rpan/picalculate/output4 already exists
        at org.apache.hadoop.mapreduce.lib.output.FileOutputFormat.checkOutputSpecs(FileOutputFormat.java:164)
        at org.apache.hadoop.mapreduce.JobSubmitter.checkSpecs(JobSubmitter.java:277)
        at org.apache.hadoop.mapreduce.JobSubmitter.submitJobInternal(JobSubmitter.java:143)
        at org.apache.hadoop.mapreduce.Job$11.run(Job.java:1571)
        at org.apache.hadoop.mapreduce.Job$11.run(Job.java:1568)
        at java.security.AccessController.doPrivileged(Native Method)
        at javax.security.auth.Subject.doAs(Subject.java:422)
        at org.apache.hadoop.security.UserGroupInformation.doAs(UserGroupInformation.java:1878)
        at org.apache.hadoop.mapreduce.Job.submit(Job.java:1568)
        at org.apache.hadoop.mapreduce.Job.waitForCompletion(Job.java:1589)
        at PiCalculation.main(PiCalculation.java:85)
        at sun.reflect.NativeMethodAccessorImpl.invoke0(Native Method)
        at sun.reflect.NativeMethodAccessorImpl.invoke(NativeMethodAccessorImpl.java:62)
        at sun.reflect.DelegatingMethodAccessorImpl.invoke(DelegatingMethodAccessorImpl.java:43)
        at java.lang.reflect.Method.invoke(Method.java:498)
```

```
rpan@instance-2:~/hadoop-3.3.4$ ^C
rpan@instance-2:~/hadoop-3.3.4$ bin/hdfs dfs -ls /user/rpan/picalculate/output4
Found 2 items
-rw-r--r--   1 rpan supergroup          0 2022-11-29 22:44 /user/rpan/picalculate/output4/_SUCCESS
-rw-r--r--   1 rpan supergroup         27 2022-11-29 22:44 /user/rpan/picalculate/output4/part-r-00000
rpan@instance-2:~/hadoop-3.3.4$ ^C
rpan@instance-2:~/hadoop-3.3.4$ bin/hdfs dfs -cat /user/rpan/picalculate/output4/part-r-00000
inside  78455
outside 21545
rpan@instance-2:~/hadoop-3.3.4$ vim PiCalculation.java
rpan@instance-2:~/hadoop-3.3.4$ ^C
rpan@instance-2:~/hadoop-3.3.4$ []
```