DonorsChoose

DonorsChoose.org receives hundreds of thousands of project proposals each year for classroom projects in need of funding. Right now, a large number of volunteers is needed to manually screen each submission before it's approved to be posted on the DonorsChoose.org website.

Next year, DonorsChoose.org expects to receive close to 500,000 project proposals. As a result, there are three main problems they need to solve:

- How to scale current manual processes and resources to screen 500,000 projects so that they can be posted as quickly and as efficiently as possible
- How to increase the consistency of project vetting across different volunteers to improve the experience for teachers
- How to focus volunteer time on the applications that need the most assistance

The goal of the competition is to predict whether or not a DonorsChoose.org project proposal submitted by a teacher will be approved, using the text of project descriptions as well as additional metadata about the project, teacher, and school. DonorsChoose.org can then use this information to identify projects most likely to need further review before approval.

About the DonorsChoose Data Set

The `train.csv` data set provided by DonorsChoose contains the following features:

Feature	Description
`project_id`	A unique identifier for the proposed project. **Example:** p036502
`project_title`	Title of the project. **Examples:** • `Art Will Make You Happy!` • `First Grade Fun`
`project_grade_category`	Grade level of students for which the project is targeted. One of the following enumerated values: • `Grades PreK-2` • `Grades 3-5` • `Grades 6-8` • `Grades 9-12`
`project_subject_categories`	One or more (comma-separated) subject categories for the project from the following enumerated list of values: • `Applied Learning` • `Care & Hunger` • `Health & Sports` • `History & Civics` • `Literacy & Language` • `Math & Science` • `Music & The Arts` • `Special Needs` • `Warmth` **Examples:** • `Music & The Arts` • `Literacy & Language, Math & Science`
`school_state`	State where school is located (Two-letter U.S. postal code (https://en.wikipedia.org/wiki/List_of_U.S._state_abbreviations#Postal_codes)). **Example:** WY

Feature	Description
project_subject_subcategories	One or more (comma-separated) subject subcategories for the project. **Examples:** • `Literacy` • `Literature & Writing, Social Sciences`
project_resource_summary	An explanation of the resources needed for the project. **Example:** • `My students need hands on literacy materials to manage sensory needs!`
project_essay_1	First application essay[*]
project_essay_2	Second application essay[*]
project_essay_3	Third application essay[*]
project_essay_4	Fourth application essay[*]
project_submitted_datetime	Datetime when project application was submitted. **Example:** `2016-04-28 12:43:56.245`
teacher_id	A unique identifier for the teacher of the proposed project. **Example:** `bdf8baa8fedef6bfeec7ae4ff1c15c56`
teacher_prefix	Teacher's title. One of the following enumerated values: • `nan` • `Dr.` • `Mr.` • `Mrs.` • `Ms.` • `Teacher.`
teacher_number_of_previously_posted_projects	Number of project applications previously submitted by the same teacher. **Example:** 2

[*] See the section **Notes on the Essay Data** for more details about these features.

Additionally, the `resources.csv` data set provides more data about the resources required for each project. Each line in this file represents a resource required by a project:

Feature	Description
id	A `project_id` value from the `train.csv` file. **Example:** `p036502`
description	Desciption of the resource. **Example:** `Tenor Saxophone Reeds, Box of 25`
quantity	Quantity of the resource required. **Example:** 3

Feature	Description
price	Price of the resource required. **Example:** 9.95

Note: Many projects require multiple resources. The id value corresponds to a project_id in train.csv, so you use it as a key to retrieve all resources needed for a project:

The data set contains the following label (the value you will attempt to predict):

Label	Description
project_is_approved	A binary flag indicating whether DonorsChoose approved the project. A value of 0 indicates the project was not approved, and a value of 1 indicates the project was approved.

Notes on the Essay Data

Prior to May 17, 2016, the prompts for the essays were as follows:
- __project_essay_1:__ "Introduce us to your classroom"
- __project_essay_2:__ "Tell us more about your students"
- __project_essay_3:__ "Describe how your students will use the materials you're requesting"
- __project_essay_3:__ "Close by sharing why your project will make a difference"

Starting on May 17, 2016, the number of essays was reduced from 4 to 2, and the prompts for the first 2 essays were changed to the following:
- __project_essay_1:__ "Describe your students: What makes your students special? Specific details about their background, your neighborhood, and your school are all helpful."
- __project_essay_2:__ "About your project: How will these materials make a difference in your students' learning and improve their school lives?"

For all projects with project_submitted_datetime of 2016-05-17 and later, the values of project_essay_3 and project_essay_4 will be NaN.

```
In [0]:  from google.colab import drive
         drive.mount('/content/gdrive')

         Drive already mounted at /content/gdrive; to attempt to forcibly remount, call drive.mount("/content/gdrive", force_remount=Tru
         e).
```

```python
In [0]: %matplotlib inline
        import warnings
        warnings.filterwarnings("ignore")
        import sqlite3
        import pandas as pd
        import numpy as np
        import nltk
        import string
        import matplotlib.pyplot as plt
        import seaborn as sns
        from sklearn.feature_extraction.text import TfidfVectorizer
        from sklearn.feature_extraction.text import CountVectorizer
        from sklearn.metrics import confusion_matrix
        from sklearn import metrics
        from sklearn.metrics import roc_curve, auc
        from nltk.stem.porter import PorterStemmer
        import re
        # Tutorial about Python regular expressions: https://pymotw.com/2/re/
        import string
        from nltk.corpus import stopwords
        from nltk.stem import PorterStemmer
        from nltk.stem.wordnet import WordNetLemmatizer
        from gensim.models import Word2Vec
        from gensim.models import KeyedVectors
        import pickle
        from tqdm import tqdm
        import os
        import chart_studio.plotly
        import plotly.offline as offline
        import plotly.graph_objs as go
        offline.init_notebook_mode()
        from collections import Counter
        from scipy.sparse import hstack,vstack
        from sklearn.model_selection import train_test_split
        from sklearn.metrics import accuracy_score
        from sklearn import model_selection
        from sklearn.metrics import roc_auc_score
        from sklearn.model_selection import GridSearchCV
        from prettytable import PrettyTable
        from sklearn.preprocessing import Normalizer
        import nltk
        from nltk.sentiment.vader import SentimentIntensityAnalyzer
        nltk.download('vader_lexicon')
        import pdb
        from sklearn.cluster import KMeans
```

```
from sklearn.feature_selection import SelectKBest,f_classif
import graphviz
from sklearn import tree
from graphviz import Source
from sklearn.externals.six import StringIO
from IPython.display import Image
from wordcloud import WordCloud
import scipy.cluster.hierarchy as shc
from sklearn.cluster import AgglomerativeClustering
from sklearn.neighbors import KDTree
from sklearn.cluster import DBSCAN
import pydotplus
```

```
[nltk_data] Downloading package vader_lexicon to /root/nltk_data...
[nltk_data]   Package vader_lexicon is already up-to-date!
```

1.1 Reading Data

```
In [0]:  Project_data = pd.read_csv('/content/gdrive/My Drive/Colab Notebooks/train_data.csv')
         Resource_data = pd.read_csv('/content/gdrive/My Drive/Colab Notebooks/resources.csv')
         print(Project_data.shape)
         print(Resource_data.shape)
```

```
(109248, 17)
(1541272, 4)
```

```
In [0]:  # how to replace elements in list python: https://stackoverflow.com/a/2582163/4084039
         cols = ['Date' if x=='project_submitted_datetime' else x for x in list(Project_data.columns)]
         #sort dataframe based on time pandas python: https://stackoverflow.com/a/49702492/4084039
         Project_data['Date'] = pd.to_datetime(Project_data['project_submitted_datetime'])
         Project_data.drop('project_submitted_datetime', axis=1, inplace=True)
         Project_data.sort_values(by=['Date'], inplace=True)
         # how to reorder columns pandas python: https://stackoverflow.com/a/13148611/4084039
         Project_data = Project_data[cols]
         Project_data.head(2)
```

Out[0]:

	Unnamed: 0	id	teacher_id	teacher_prefix	school_state	Date	project_grade_category	project_subject_
55660	8393	p205479	2bf07ba08945e5d8b2a3f269b2b3cfe5	Mrs.	CA	2016-04-27 00:27:36	Grades PreK-2	Math & Science
76127	37728	p043609	3f60494c61921b3b43ab61bdde2904df	Ms.	UT	2016-04-27 00:31:25	Grades 3-5	Special Needs

2. Clustering

Only 10K Data Points were used for this assignment.

2.1 Splitting data

```
In [0]:  Y = Project_data['project_is_approved'].values
         Project_data.drop(['project_is_approved'], axis=1, inplace=True)
         lpd = len(Project_data)
         ys = np.zeros(lpd, dtype=np.int32)
         X = Project_data
```

```
In [0]:  #Spliting the Dataset into three Train and Test
         X_DB, X_Test, Y, Y_Test = train_test_split(X, Y, test_size=0.90, random_state=0, stratify=ys)

         #print('Shape of the X_Train data is {0} and Y_Train data is: {1}'.format(X_DB.shape))
```

```
In [0]:  #Y = Project_data['project_is_approved'].values
         #Project_data.drop(['project_is_approved'], axis=1, inplace=True)
         #X_DB = Project_data
         print(f"Shape of DataFrame:{X_DB.shape}")
```

```
Shape of DataFrame:(10924, 16)
```

1.2 preprocessing of `project_subject_categories`

```
In [0]:  # remove special characters from list of strings python: https://stackoverflow.com/a/47301924/4084039
         # https://www.geeksforgeeks.org/removing-stop-words-nltk-python/
         # https://stackoverflow.com/questions/23669024/how-to-strip-a-specific-word-from-a-string
         # https://stackoverflow.com/questions/8270092/remove-all-whitespace-in-a-string-in-python
         catogories_train = list(X_DB['project_subject_categories'].values)
         cat_list = []
         for i in catogories_train:
             temp = ""
             # consider we have text like this "Math & Science, Warmth, Care & Hunger"
             for j in i.split(','): # it will split it in three parts ["Math & Science", "Warmth", "Care & Hunger"]
                 if 'The' in j.split(): # this will split each of the catogory based on space "Math & Science"=> "Math","&", "Science"
                     j=j.replace('The','') # if we have the words "The" we are going to replace it with ''(i.e removing 'The')
                 j = j.replace(' ','') # we are placeing all the ' '(space) with ''(empty) ex:"Math & Science"=>"Math&Science"
                 temp+=j.strip()+" " #" abc ".strip() will return "abc", remove the trailing spaces
                 temp = temp.replace('&','_') # we are replacing the & value into
             cat_list.append(temp.strip())

         X_DB['clean_categories'] = cat_list
         X_DB.drop(['project_subject_categories'], axis=1, inplace=True)

         from collections import Counter
         my_counter = Counter()
         for word in X_DB['clean_categories'].values:
             my_counter.update(word.split())

         cat_dict = dict(my_counter)
         sorted_cat_dict_train = dict(sorted(cat_dict.items(), key=lambda kv: kv[1]))

         print(len(sorted_cat_dict_train))
```

9

1.3 preprocessing of `project_subject_subcategories`

```
In [0]: # remove special characters from list of strings python: https://stackoverflow.com/a/47301924/4084039
        # https://www.geeksforgeeks.org/removing-stop-words-nltk-python/
        # https://stackoverflow.com/questions/23669024/how-to-strip-a-specific-word-from-a-string
        # https://stackoverflow.com/questions/8270092/remove-all-whitespace-in-a-string-in-python
        sub_catogories_train = list(X_DB['project_subject_subcategories'].values)
        sub_cat_list = []
        for i in sub_catogories_train:
            temp = ""
            # consider we have text like this "Math & Science, Warmth, Care & Hunger"
            for j in i.split(','): # it will split it in three parts ["Math & Science", "Warmth", "Care & Hunger"]
                if 'The' in j.split(): # this will split each of the catogory based on space "Math & Science"=> "Math","&", "Science"
                    j=j.replace('The','') # if we have the words "The" we are going to replace it with ''(i.e removing 'The')
                j = j.replace(' ','') # we are placeing all the ' '(space) with ''(empty) ex:"Math & Science"=>"Math&Science"
                temp +=j.strip()+" #" abc ".strip() will return "abc", remove the trailing spaces
                temp = temp.replace('&','_')
            sub_cat_list.append(temp.strip())

        X_DB['clean_subcategories'] = sub_cat_list
        X_DB.drop(['project_subject_subcategories'], axis=1, inplace=True)

        # count of all the words in corpus python: https://stackoverflow.com/a/22898595/4084039
        my_counter = Counter()
        for word in X_DB['clean_subcategories'].values:
            my_counter.update(word.split())

        sub_cat_dict = dict(my_counter)
        sorted_sub_cat_dict_train = dict(sorted(sub_cat_dict.items(), key=lambda kv: kv[1]))

        print(len(sorted_sub_cat_dict_train))
```

30

1.3 Text preprocessing

```
In [0]: # merge two column text dataframe:
        X_DB["essay"] = X_DB["project_essay_1"].map(str) +\
                        X_DB["project_essay_2"].map(str) + \
                        X_DB["project_essay_3"].map(str) + \
                        X_DB["project_essay_4"].map(str)
```

```
In [0]:  # https://stackoverflow.com/a/47091490/4084039
         import re

         def decontracted(phrase):
             # specific
             phrase = re.sub(r"won't", "will not", phrase)
             phrase = re.sub(r"can\'t", "can not", phrase)
             # general
             phrase = re.sub(r"n\'t", " not", phrase)
             phrase = re.sub(r"\'re", " are", phrase)
             phrase = re.sub(r"\'s", " is", phrase)
             phrase = re.sub(r"\'d", " would", phrase)
             phrase = re.sub(r"\'ll", " will", phrase)
             phrase = re.sub(r"\'t", " not", phrase)
             phrase = re.sub(r"\'ve", " have", phrase)
             phrase = re.sub(r"\'m", " am", phrase)
             return phrase
```

```
In [0]:  # https://gist.github.com/sebleier/554280
         # we are removing the words from the stop words list: 'no', 'nor', 'not'
         stopwords = ['i', 'me', 'my', 'myself', 'we', 'our', 'ours', 'ourselves', 'you', "you're", "you've",\
                      "you'll", "you'd", 'your', 'yours', 'yourself', 'yourselves', 'he', 'him', 'his', 'himself', \
                      'she', "she's", 'her', 'hers', 'herself', 'it', "it's", 'its', 'itself', 'they', 'them', 'their',\
                      'theirs', 'themselves', 'what', 'which', 'who', 'whom', 'this', 'that', "that'll", 'these', 'those', \
                      'am', 'is', 'are', 'was', 'were', 'be', 'been', 'being', 'have', 'has', 'had', 'having', 'do', 'does', \
                      'did', 'doing', 'a', 'an', 'the', 'and', 'but', 'if', 'or', 'because', 'as', 'until', 'while', 'of', \
                      'at', 'by', 'for', 'with', 'about', 'against', 'between', 'into', 'through', 'during', 'before', 'after',\
                      'above', 'below', 'to', 'from', 'up', 'down', 'in', 'out', 'on', 'off', 'over', 'under', 'again', 'further',\
                      'then', 'once', 'here', 'there', 'when', 'where', 'why', 'how', 'all', 'any', 'both', 'each', 'few', 'more',\
                      'most', 'other', 'some', 'such', 'only', 'own', 'same', 'so', 'than', 'too', 'very', \
                      's', 't', 'can', 'will', 'just', 'don', "don't", 'should', "should've", 'now', 'd', 'll', 'm', 'o', 're', \
                      've', 'y', 'ain', 'aren', "aren't", 'couldn', "couldn't", 'didn', "didn't", 'doesn', "doesn't", 'hadn',\
                      "hadn't", 'hasn', "hasn't", 'haven', "haven't", 'isn', "isn't", 'ma', 'mightn', "mightn't", 'mustn',\
                      "mustn't", 'needn', "needn't", 'shan', "shan't", 'shouldn', "shouldn't", 'wasn', "wasn't", 'weren', "weren't", \
                      'won', "won't", 'wouldn', "wouldn't"]
```

```
In [0]: # Combining all the above stundents
        # tqdm is for printing the status bar

        preprocessed_essays_train = []


        for sentance in tqdm(X_DB['essay'].values):
            sent = decontracted(sentance)
            sent = sent.replace('\\r', ' ')
            sent = sent.replace('\\"', ' ')
            sent = sent.replace('\\n', ' ')
            sent = re.sub('[^A-Za-z0-9]+', ' ', sent)
            # https://gist.github.com/sebleier/554280
            sent = ' '.join(e for e in sent.split() if e.lower() not in stopwords)
            preprocessed_essays_train.append(sent.lower().strip())

        print(f"Shape of preprocessed_essays after preprocessing: {len(preprocessed_essays_train)}")
```

```
100%|████████████| 10924/10924 [00:06<00:00, 1675.12it/s]
```

Shape of preprocessed_essays after preprocessing: 10924

```
In [0]: word_count_essay_train = []
        for a in tqdm(X_DB["essay"]) :
            b = len(a.split())
            word_count_essay_train.append(b)

        X_DB["word_count_essay_train"] = word_count_essay_train
```

```
100%|████████████| 10924/10924 [00:00<00:00, 60467.81it/s]
```

1.4 Preprocessing of `project_title`

```
In [0]:  preprocessed_titles_train = []
         # tqdm is for printing the status bar
         for sentence in tqdm(X_DB['project_title'].values):
             sent = decontracted(sentance)
             sent = sent.replace('\\r', ' ')
             sent = sent.replace('\\"', ' ')
             sent = sent.replace('\\n', ' ')
             sent = re.sub('[^A-Za-z0-9]+', ' ', sent)
             # https://gist.github.com/sebleier/554280
             sent = ' '.join(e for e in sent.split() if e not in stopwords)
             preprocessed_titles_train.append(sent.lower().strip())




         print(f"Shape of preprocessed_titles after preprocessing: {len(preprocessed_titles_train)}")
```

100%|██████████| 10924/10924 [00:00<00:00, 37927.40it/s]

Shape of preprocessed_titles after preprocessing: 10924

```
In [0]:  word_count_title_train = []
         for a in tqdm(X_DB["project_title"]) :
             b = len(a.split())
             word_count_title_train.append(b)

         X_DB["word_count_title_train"] = word_count_title_train
```

100%|██████████| 10924/10924 [00:00<00:00, 479544.69it/s]

Make Data Model Ready: encoding numerical, categorical features

1.5 Preparing data for models

1.5.1 Vectorizing Categorical data

-

```
In [0]:  # we use count vectorizer to convert the values into one
         vectorizer_cat = CountVectorizer(vocabulary=list(sorted_cat_dict_train.keys()), lowercase=False, binary=True)
         vectorizer_cat.fit(X_DB['clean_categories'].values)
         categories_one_hot_train = vectorizer_cat.transform(X_DB['clean_categories'].values)

         print(vectorizer_cat.get_feature_names())
         print(f"Shape of categories_one_hot matrix after one hot encodig: {categories_one_hot_train.shape}")
```

```
['Warmth', 'Care_Hunger', 'History_Civics', 'Music_Arts', 'AppliedLearning', 'SpecialNeeds', 'Health_Sports', 'Math_Science',
'Literacy_Language']
Shape of categories_one_hot matrix after one hot encodig: (10924, 9)
```

```
In [0]:  # we use count vectorizer to convert the values into one
         vectorizer_sub_cat = CountVectorizer(vocabulary=list(sorted_sub_cat_dict_train.keys()), lowercase=False, binary=True)
         sub_categories_one_hot_train = vectorizer_sub_cat.fit_transform(X_DB['clean_subcategories'].values)

         print(vectorizer_sub_cat.get_feature_names())
         print(f"Shape of sub_categories_one_hot matrix after one hot encodig: {sub_categories_one_hot_train.shape}")
```

```
['Economics', 'FinancialLiteracy', 'CommunityService', 'ForeignLanguages', 'ParentInvolvement', 'Civics_Government', 'Extracurr
icular', 'Warmth', 'Care_Hunger', 'NutritionEducation', 'PerformingArts', 'SocialSciences', 'CharacterEducation', 'TeamSports',
'Other', 'College_CareerPrep', 'Music', 'History_Geography', 'EarlyDevelopment', 'ESL', 'Health_LifeScience', 'Gym_Fitness', 'E
nvironmentalScience', 'VisualArts', 'Health_Wellness', 'AppliedSciences', 'SpecialNeeds', 'Literature_Writing', 'Mathematics',
'Literacy']
Shape of sub_categories_one_hot matrix after one hot encodig: (10924, 30)
```

School State

```
In [0]:  sch1_catogories = list(X_DB['school_state'].values)
         school_list = []
         for sent in sch1_catogories:
             school_list.append(sent.lower().strip())
         X_DB['school_categories'] = school_list
         X_DB.drop(['school_state'], axis=1, inplace=True)

         # count of all the words in corpus python: https://stackoverflow.com/a/22898595/4084039
         my_counter_sch = Counter()
         for word in X_DB['school_categories'].values:
             my_counter_sch.update(word.split())

         # dict sort by value python: https://stackoverflow.com/a/613218/4084039
         sch_dict = dict(my_counter_sch)
         sorted_sch_dict = dict(sorted(sch_dict.items(), key=lambda kv: kv[1]))

         vectorizer_sch = CountVectorizer(vocabulary=list(sorted_sch_dict.keys()), lowercase=False, binary=True)
         vectorizer_sch.fit(X_DB['school_categories'].values)
         #print(vectorizer.get_feature_names())

         sch_one_hot_train = vectorizer_sch.transform(X_DB['school_categories'].values)
         print(f"Shape of sch_one_hot matrix after one hot encodig: {sch_one_hot_train.shape}")
```

Shape of sch_one_hot matrix after one hot encodig: (10924, 51)

Prefix

```python
# remove special characters from list of strings python: https://stackoverflow.com/a/47301924/4084039
# https://www.geeksforgeeks.org/removing-stop-words-nltk-python/
# https://stackoverflow.com/questions/23669024/how-to-strip-a-specific-word-from-a-string
# https://stackoverflow.com/questions/8270092/remove-all-whitespace-in-a-string-in-python
prefix_catogories_train = list(X_DB['teacher_prefix'].values)
prefix_list_train = []
for sent in prefix_catogories_train:
    sent = re.sub('[^A-Za-z0-9]+', ' ', str(sent))
    # https://gist.github.com/sebleier/554280
    sent = ' '.join(e for e in sent.split())
    prefix_list_train.append(sent.lower().strip())
X_DB['prefix_catogories'] = prefix_list_train
X_DB.drop(['teacher_prefix'], axis=1, inplace=True)

# count of all the words in corpus python: https://stackoverflow.com/a/22898595/4084039
my_counter_prefix_train = Counter()
for word in X_DB['prefix_catogories'].values:
    my_counter_prefix_train.update(word.split())

# dict sort by value python: https://stackoverflow.com/a/613218/4084039
prefix_dict_train = dict(my_counter_prefix_train)
sorted_prefix_dict_train = dict(sorted(prefix_dict_train.items(), key=lambda kv: kv[1]))

vectorizer_prefix = CountVectorizer(vocabulary=list(sorted_prefix_dict_train.keys()), lowercase=False, binary=True)
vectorizer_prefix.fit(X_DB['prefix_catogories'].values)
#print(vectorizer.get_feature_names())

prefix_one_hot_train = vectorizer_prefix.transform(X_DB['prefix_catogories'].values)
print(f"Shape of prefix_one_hot matrix after one hot encodig:{prefix_one_hot_train.shape}")
```

Shape of prefix_one_hot matrix after one hot encodig:(10924, 4)

project_grade_category

```
In [0]:  # remove special characters from list of strings python: https://stackoverflow.com/a/47301924/4084039
         # https://www.geeksforgeeks.org/removing-stop-words-nltk-python/
         # https://stackoverflow.com/questions/23669024/how-to-strip-a-specific-word-from-a-string
         # https://stackoverflow.com/questions/8270092/remove-all-whitespace-in-a-string-in-python
         grade_catogories_train = list(X_DB['project_grade_category'].values)
         grade_list_train = []
         for sent in grade_catogories_train:
             sent = sent.replace('-','_')
             sent = sent.replace(' ','_')
             # sent = re.sub('[^A-Za-z0-9]+', ' ', str(sent))
             # https://gist.github.com/sebleier/554280
             sent = ' '.join(e for e in sent.split())
             grade_list_train.append(sent.lower().strip())

         # temp = temp.replace('-','_')
         X_DB['new_grade_category'] = grade_list_train
         X_DB.drop(['project_grade_category'], axis=1, inplace=True)

         # count of all the words in corpus python: https://stackoverflow.com/a/22898595/4084039
         my_counter_grade_train = Counter()
         for word in X_DB['new_grade_category'].values:
             my_counter_grade_train.update(word.split())

         # dict sort by value python: https://stackoverflow.com/a/613218/4084039
         grade_dict_train = dict(my_counter_grade_train)
         sorted_grade_dict_train = dict(sorted(grade_dict_train.items(), key=lambda kv: kv[1]))


         vectorizer_grade = CountVectorizer(vocabulary=list(sorted_grade_dict_train.keys()), lowercase=False, binary=True)
         vectorizer_grade.fit(X_DB['new_grade_category'].values)


         grade_one_hot_train = vectorizer_grade.transform(X_DB['new_grade_category'].values)
         print(f"Shape of grade_one_hot matrix after one hot encodig: {grade_one_hot_train.shape}")

         Shape of grade_one_hot matrix after one hot encodig: (10924, 4)
```

1.5.2 Make Data Model Ready: Vectorizing Numerical features

Price and Quantity data

```
In [0]:  price_data = Resource_data.groupby('id').agg({'price':'sum', 'quantity':'sum'}).reset_index()
         X_DB = pd.merge(X_DB, price_data, on='id', how='left')
```

```
In [0]:  price_norm = Normalizer(norm='l2', copy=False)
         price_norm.fit(X_DB['price'].values.reshape(1,-1))

         price_norm.transform(X_DB['price'].values.reshape(1,-1))

         price_norm_train = (X_DB['price'].values.reshape(-1,1))

         print(f"Shape of price_norm matrix after one hot encodig:{price_norm_train.shape} ")
```

Shape of price_norm matrix after one hot encodig:(10924, 1)

```
In [0]:  quantity_norm = Normalizer(norm='l2', copy=False)
         quantity_norm.fit(X_DB['quantity'].values.reshape(1,-1))

         quantity_norm_train = quantity_norm.transform(X_DB['quantity'].values.reshape(1,-1))

         quantity_norm_train = (X_DB['quantity'].values.reshape(-1,1))

         print(f"Shape of quantity_norm matrix after one hot encodig: {price_norm_train.shape}")
```

Shape of quantity_norm matrix after one hot encodig: (10924, 1)

teacher_number_of_previously_posted_projects

```
In [0]:  teacher_prev_post_norm = Normalizer(norm='l2', copy=False)
         teacher_prev_post_norm.fit(X_DB['teacher_number_of_previously_posted_projects'].values.reshape(1,-1))

         teacher_prev_post_norm_train = teacher_prev_post_norm.transform(X_DB['teacher_number_of_previously_posted_projects'].values.res
         hape(1,-1))

         teacher_prev_post_norm_train = (X_DB['teacher_number_of_previously_posted_projects'].values.reshape(-1,1))

         print(f"Shape of teacher_prev_post_norm matrix after one hot encodig: {teacher_prev_post_norm_train.shape}")
```

Shape of teacher_prev_post_norm matrix after one hot encodig: (10924, 1)

Title word count

```
In [0]: title_norm = Normalizer(norm='l2', copy=False)
        title_norm.fit(X_DB['word_count_title_train'].values.reshape(1,-1))
        word_count_title_train = title_norm.transform(X_DB['word_count_title_train'].values.reshape(1,-1))

        word_count_title_train = (X_DB['word_count_title_train'].values.reshape(-1,1))

        print(f"Shape of tile word count: {word_count_title_train.shape}")
```

Shape of tile word count: (10924, 1)

Essay word count

```
In [0]: essay_norm = Normalizer(norm='l2', copy=False)
        essay_norm.fit(X_DB['word_count_essay_train'].values.reshape(1,-1))
        word_count_essay_train = essay_norm.transform(X_DB['word_count_essay_train'].values.reshape(1,-1))

        word_count_essay_train = (X_DB['word_count_essay_train'].values.reshape(-1,1))

        print(f"Shape of tile word count: {word_count_essay_train.shape}")
```

Shape of tile word count: (10924, 1)

Sentiment Scores

```
In [0]:  # https://www.geeksforgeeks.org/python-sentiment-analysis-using-vader/
         sid = SentimentIntensityAnalyzer()
         essays = X_DB['essay']

         sentiment_pos_essay_Train = []
         sentiment_neg_essay_Train = []
         sentiment_neut_essay_Train = []
         sentiment_com_essay_Train = []

         for essay in tqdm(essays):
             res = sid.polarity_scores(essay)
             sentiment_pos_essay_Train.append(res['pos'])
             sentiment_neg_essay_Train.append(res['neg'])
             sentiment_neut_essay_Train.append(res['neu'])
             sentiment_com_essay_Train.append(res['compound'])
         X_DB['sentiment_pos_essay_Train'] = sentiment_pos_essay_Train
         X_DB['sentiment_neg_essay_Train'] = sentiment_neg_essay_Train
         X_DB['sentiment_neut_essay_Train'] = sentiment_neut_essay_Train
         X_DB['sentiment_com_essay_Train'] = sentiment_com_essay_Train


         sentiment_norm_pos = Normalizer(norm='l2', copy=False)
         sentiment_norm_neg = Normalizer(norm='l2', copy=False)
         sentiment_norm_neut = Normalizer(norm='l2', copy=False)
         sentiment_norm_com = Normalizer(norm='l2', copy=False)

         sentiment_norm_pos.fit(X_DB['sentiment_pos_essay_Train'].values.reshape(1,-1))
         sentiment_norm_neg.fit(X_DB['sentiment_neg_essay_Train'].values.reshape(1,-1))
         sentiment_norm_neut.fit(X_DB['sentiment_neut_essay_Train'].values.reshape(1,-1))
         sentiment_norm_com.fit(X_DB['sentiment_com_essay_Train'].values.reshape(1,-1))

         senti_pos_ess_Tr_norm = sentiment_norm_pos.transform(X_DB['sentiment_pos_essay_Train'].values.reshape(1,-1))
         senti_pos_ess_Tr_norm = (X_DB['sentiment_pos_essay_Train'].values.reshape(-1,1))

         senti_neg_ess_Tr_norm = sentiment_norm_neg.transform(X_DB['sentiment_neg_essay_Train'].values.reshape(1,-1))
         senti_neg_ess_Tr_norm = (X_DB['sentiment_neg_essay_Train'].values.reshape(-1,1))

         senti_neut_ess_Tr_norm = sentiment_norm_neut.transform(X_DB['sentiment_neut_essay_Train'].values.reshape(1,-1))
         senti_neut_ess_Tr_norm = (X_DB['sentiment_neut_essay_Train'].values.reshape(-1,1))

         senti_com_ess_Tr_norm = sentiment_norm_com.transform(X_DB['sentiment_com_essay_Train'].values.reshape(1,-1))
         senti_com_ess_Tr_norm = (X_DB['sentiment_com_essay_Train'].values.reshape(-1,1))


         print(f"Shape of senti_pos_ess_norm matrix after one hot encodig: {senti_pos_ess_Tr_norm.shape}")
```

```
print(f"Shape of senti_neg_ess_norm matrix after one hot encodig: {senti_neg_ess_Tr_norm.shape}")
print(f"Shape of senti_neut_ess_norm matrix after one hot encodig: {senti_neut_ess_Tr_norm.shape}")
print(f"Shape of senti_com_ess_norm matrix after one hot encodig: {senti_com_ess_Tr_norm.shape}")
```

```
100%|██████████| 10924/10924 [00:31<00:00, 350.63it/s]

Shape of senti_pos_ess_norm matrix after one hot encodig: (10924, 1)
Shape of senti_neg_ess_norm matrix after one hot encodig: (10924, 1)
Shape of senti_neut_ess_norm matrix after one hot encodig: (10924, 1)
Shape of senti_com_ess_norm matrix after one hot encodig: (10924, 1)
```

2.3 Make Data Model Ready: encoding essay, and project_title

1.5.3 Vectorizing Text data

1.5.2.2 TFIDF vectorizer

```
In [0]: vectorizer_essays_tfidf = TfidfVectorizer(min_df=10,max_features=5000)
        X_Tr_Es_DS = pd.DataFrame()
        X_Tr_Es_DS['essay'] = preprocessed_essays_train
        text_tfidf_train = vectorizer_essays_tfidf.fit_transform(preprocessed_essays_train)

        print(f"Shape of matrix after one hot encodig: {text_tfidf_train.shape}")
```

```
Shape of matrix after one hot encodig: (10924, 5000)
```

TFIDF vectorizer for Project Title

```
In [0]: vectorizer_titles_tfidf = TfidfVectorizer(min_df=10,max_features=5000)
        X_Tr_Es_DS['title'] = preprocessed_titles_train
        title_tfidf_train = vectorizer_titles_tfidf.fit_transform(preprocessed_titles_train)

        print(f"Shape of matrix(title) after one hot encoding: {title_tfidf_train.shape}")
```

```
Shape of matrix(title) after one hot encoding: (10924, 719)
```

1.5.4 Merging all the above features

- we need to merge all the vectors i.e catogorical, text, numerical vectors

Merging vectorised Train data

```
In [0]:  # merge two sparse matrices: https://stackoverflow.com/a/19710648/4084039
         X_TFIDF = hstack((categories_one_hot_train,sub_categories_one_hot_train,sch_one_hot_train,grade_one_hot_train,prefix_one_hot_tr
         ain, text_tfidf_train,title_tfidf_train, price_norm_train, quantity_norm_train, teacher_prev_post_norm_train, word_count_essay_
         train, word_count_title_train, senti_pos_ess_Tr_norm,senti_neg_ess_Tr_norm,senti_neut_ess_Tr_norm,senti_com_ess_Tr_norm))
         print(X_TFIDF.shape)
         print(Y.shape)
```

```
(10924, 5826)
(10924,)
```

Assignment 10: Clustering

- step 1: Choose any vectorizer (data matrix) that you have worked in any of the assignments, and got the best AUC value.
- step 2: Choose any of the feature selection (https://scikit-learn.org/stable/modules/feature_selection.html)/reduction algorithms (https://scikit-learn.org/stable/modules/decomposition.html) ex: selectkbest features, pretrained word vectors, model based feature selection etc and reduce the number of features to 5k features
- step 3: Apply all three kmeans, Agglomerative clustering, DBSCAN
  - **K-Means Clustering:**
    - Find the best 'k' using the elbow-knee method (plot k vs inertia_)
  - **Agglomerative Clustering:**
    - Apply agglomerative algorithm (https://stackabuse.com/hierarchical-clustering-with-python-and-scikit-learn/) and try a different number of clusters like 2,5 etc.
    - You can take less data points (as this is very computationally expensive one) to perform hierarchical clustering because they do take a considerable amount of time to run.
  - **DBSCAN Clustering:**
    - Find the best 'eps' using the elbow-knee method (https://stackoverflow.com/a/48558030/4084039).
    - You can take a smaller sample size for this as well.
- step 4: Summarize each cluster by manually observing few points from each cluster.
- step 5: You need to plot the word cloud with essay text for each cluster for each of algorithms mentioned in step 3.

2.4 Dimensionality Reduction on the selected features

```
In [0]:  # https://stats.stackexchange.com/questions/341332/how-to-scale-for-selectkbest-for-feature-selection
         X_5K = SelectKBest(f_classif, k=5000).fit(X_TFIDF, Y)
         X_5K_Feat = X_5K.transform(X_TFIDF)
         print(X_5K_Feat.shape)
```

(10924, 5000)

2.5 Apply Kmeans

```
In [0]:  %%time
         Cl_Pa=[2,3,5,7,10,15,20,25,30]
         #Cl_Pa=[2,3,5,10,25,50,100,200]
         obj_loss = []
         for i in Cl_Pa:
           kmeans = KMeans(n_clusters=i, random_state=0, n_jobs=-1).fit(X_5K_Feat)
           obj_loss.append(kmeans.inertia_)
```

CPU times: user 863 ms, sys: 190 ms, total: 1.05 s
Wall time: 2h 18min 15s

```
In [0]:  %%time
         # Performance of model on data for each hyper parameter.
         plt.close()
         plt.scatter(Cl_Pa, obj_loss, label='K Points', c='R', marker='x',linewidths=10)
         plt.plot(Cl_Pa, obj_loss, label='Objective Loss',c='orange')
         plt.gca()
         plt.legend()
         plt.xlabel("Number of Clusters(K)")
         plt.ylabel("Objective Loss")
         plt.axhline(y=11427327.719192185, xmin=0, xmax=0.20, ls='--',c='black')
         plt.axvline(x=7, ymin=0, ymax=0.32, ls='--', c='black')
         plt.title("Hyperparameter tuning : Number of Clusters(K) vs Objective Loss")
         plt.grid()
         plt.show()
```
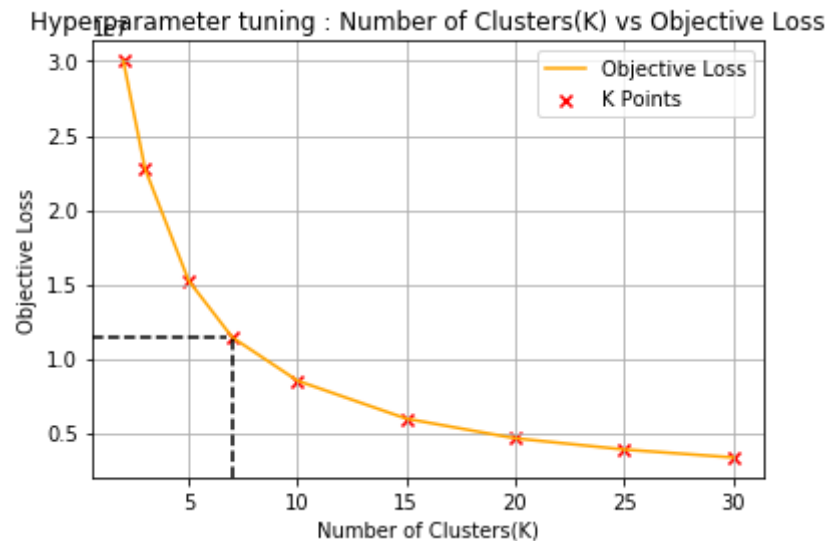

CPU times: user 251 ms, sys: 109 ms, total: 360 ms
Wall time: 244 ms

OBSERVATION:

From the above cuver the elbow cuvre is observed at the point 7(i.e., Mimimal loss is observed at the point 7).

In [0]: `print(obj_loss)`

```
[30033558.480239507, 22743714.98888698, 15238809.151488597, 11427327.719192185, 8505771.10573888, 5951907.020625975, 4630288.97
0696932, 3878395.516553365, 3342512.3022119165]
```

```
In [0]:  %%time
         k_opt=7
         kmeans_opt = KMeans(n_clusters=k_opt, random_state=0, n_jobs=-1).fit(X_5K_Feat)

         def Cluster_Seperation(lbl,i_val):
           c = []
           c.append(essays[i])
           return c

         essays = X_Tr_Es_DS['essay'].values
         Clstr=[]
         for j in range(k_opt):
           for i in range(kmeans_opt.labels_.shape[0]):
             if kmeans_opt.labels_[i] == j:
               clstr_val=Cluster_Seperation(kmeans_opt.labels_,i)
               Clstr.append(Clstr)
               if(i == j):
                 break;
           words=''
           for i in clstr_val:
             words+=str(i)
           print(f"Word Cloud for Cluster:{j+1}")
           wordcloud = WordCloud(background_color="white",stopwords = stopwords,min_font_size = 5,random_state=0,repeat=False).generate(
         words)
           # Display the generated image:
           plt.close()
           plt.figure(figsize = (10, 10), facecolor = None)
           plt.imshow(wordcloud, interpolation='bilinear')
           plt.axis("off")
           plt.show()
           print("--"*60)
```

Word Cloud for Cluster:1

Word Cloud for Cluster:2

Word Cloud for Cluster:3

Word Cloud for Cluster:4

Word Cloud for Cluster:5

Word Cloud for Cluster:6

Word Cloud for Cluster:7
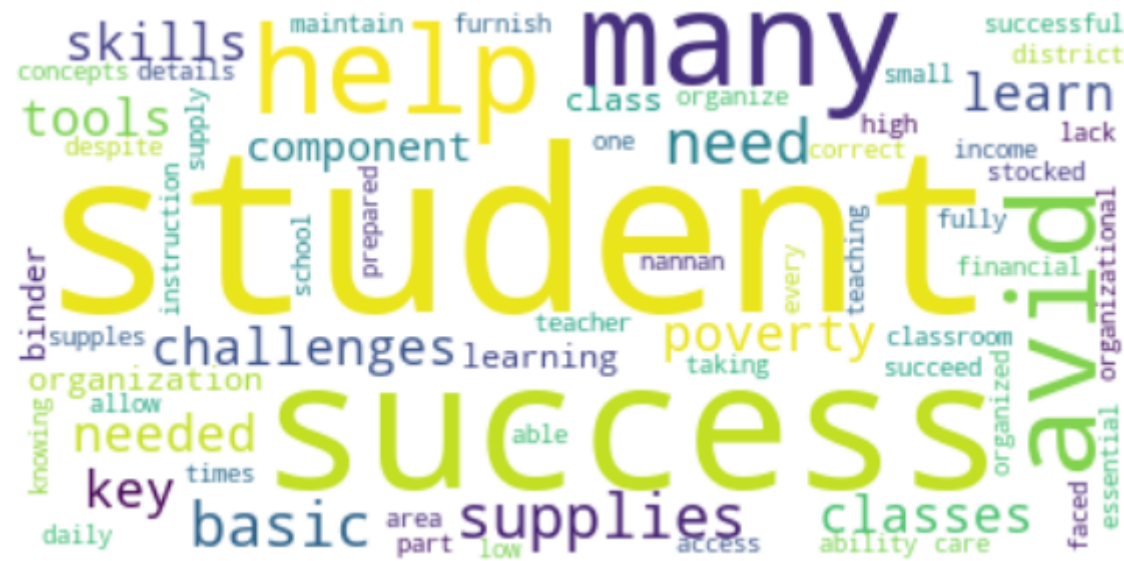
```
--------------------------------------------------------------------------------
CPU times: user 3.9 s, sys: 204 ms, total: 4.1 s
Wall time: 14min 30s
```

2.6 Apply AgglomerativeClustering

```
In [0]: %%time
        #agg = AgglomerativeClustering(n_clusters=i, affinity='euclidean', linkage='ward').fit(X_5K_Feat.todense())

        plt.figure(figsize=(20, 10))
        plt.title("Dendogram")
        dend = shc.dendrogram(shc.linkage(X_5K_Feat.todense(), method='ward'))
```

CPU times: user 5min 34s, sys: 1.06 s, total: 5min 35s
Wall time: 5min 36s
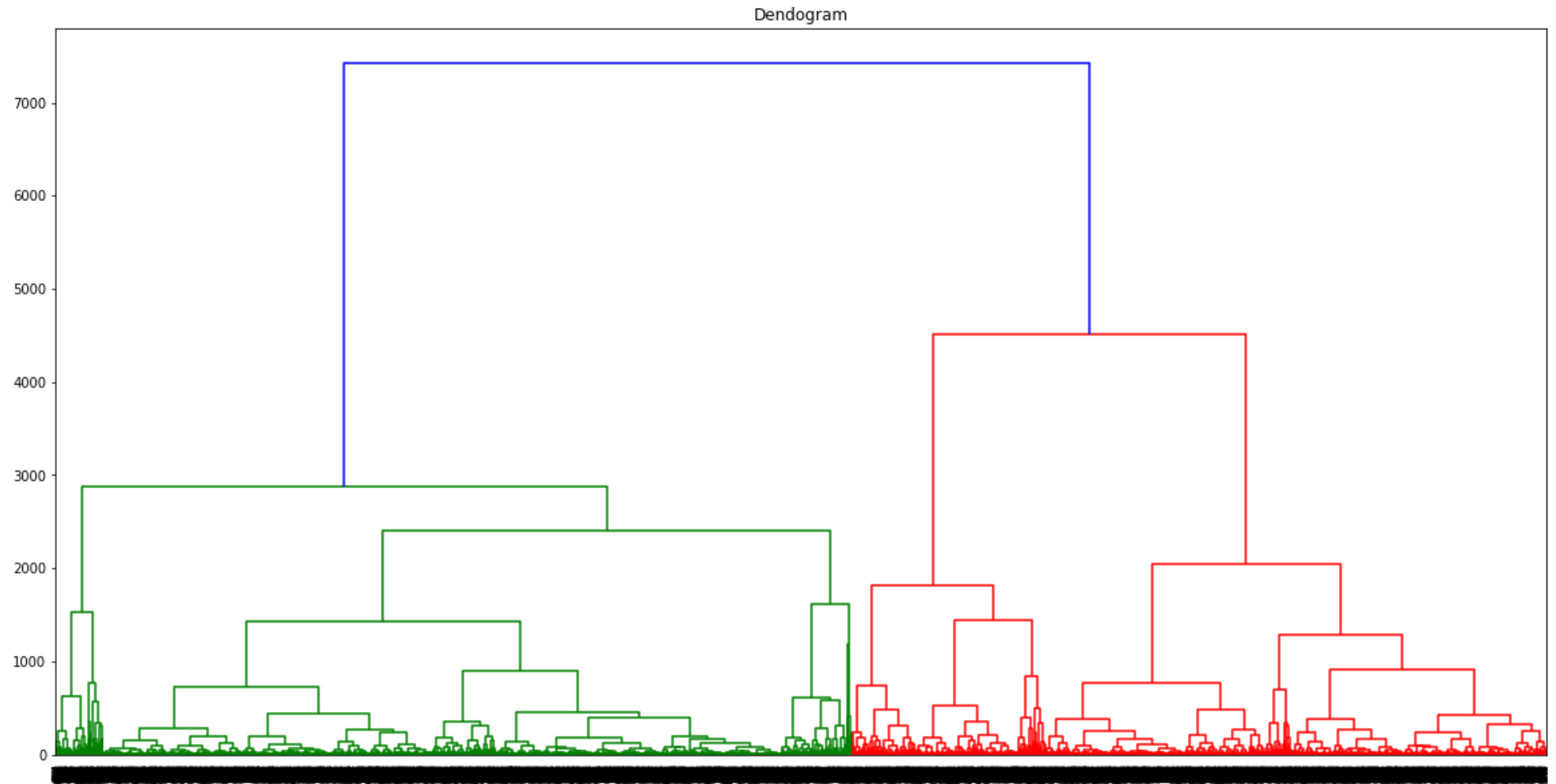
```
In [0]: a_opt=5
        agg_opt = AgglomerativeClustering(n_clusters=a_opt, affinity='euclidean', linkage='ward').fit(X_5K_Feat.todense())

        def Cluster_Seperation(lbl,i_val):
          c = []
          c.append(essays[i])
          return c

        essays = X_Tr_Es_DS['essay'].values
        Clstr=[]
        for j in range(a_opt):
          for i in range(agg_opt.labels_.shape[0]):
            if agg_opt.labels_[i] == j:
              clstr_val=Cluster_Seperation(agg_opt.labels_,i)
              Clstr.append(Clstr)
              if(i == j):
                break;
          words=''
          for i in clstr_val:
            words+=str(i)

          print(f"Word Cloud for Cluster:{j+1}")
          wordcloud = WordCloud(background_color="white",stopwords = stopwords,min_font_size = 5,random_state=0,repeat=False).generate(
        words)
          # Display the generated image:
          plt.close()
          plt.figure(figsize = (10, 10), facecolor = None)
          plt.imshow(wordcloud, interpolation='bilinear')
          plt.axis("off")
          plt.show()
          print("--"*60)
```

Word Cloud for Cluster:1

Word Cloud for Cluster:2

Word Cloud for Cluster:3

Word Cloud for Cluster:4

Word Cloud for Cluster:5

2.7 Apply DBSCAN

```
In [0]: print(X_5K_Feat.ndim)
```

2

```
In [0]:  %%time

         # https://scikit-learn.org/stable/modules/generated/sklearn.neighbors.KDTree.html
         X_5K_Feat_DM=X_5K_Feat.todense()
         minPts = 4
         tree = KDTree(X_5K_Feat_DM)
         idx = 0
         mp_dist=[]
         D_shape = X_5K_Feat_DM.shape[0]
         for i in tqdm(range(D_shape)):
             dist, ind = tree.query(X_5K_Feat_DM[i], k=minPts)
             mp_dist.append(max(dist[0]))
         mp_dist.sort()
         print(mp_dist)
```

```
100%|████████████| 10924/10924 [00:58<00:00, 187.79it/s]
```

[2.465322974317046, 2.550809884020539, 2.552345991776758, 2.7086959560641577, 2.7086959560641577, 2.7164598667480324, 2.7333113195085077, 2.7403099116427048, 2.7403099116427048, 2.750833990346734, 2.7574054911281145, 2.7578016061299393, 2.8520554761707406, 2.866040259224589, 2.87856156540004, 2.8886168099787306, 2.891923908911903, 2.8933854129883936, 2.9042208740925988, 2.908061586223559, 2.9095649076227894, 2.910143625020814, 2.9137470188318697, 2.915651130183133, 2.934352395120333, 2.940741055441202, 2.945014409662869, 2.9475506399301237, 2.952588094154977, 2.956085704597775, 2.9617094940439266, 2.9668559346012495, 2.9683774310919966, 2.9708075016232365, 2.981037804287126, 2.989187067374367, 2.9899742963688456, 2.9994126369550718, 3.0055911186505644, 3.005758261249982, 3.0074718400641154, 3.008591680843875, 3.0116679110181437, 3.015471375035629, 3.0221908490127194, 3.0226590699984013, 3.0255967957373446, 3.032170758021093, 3.03537722891191, 3.043366686801599, 3.0463925530750102, 3.0473141672443678, 3.0477920440464596, 3.0485900965244217, 3.048643583494746, 3.048643583494746, 3.0498852157278886, 3.0524374699195933, 3.0524374699195933, 3.0543912910706, 3.055304503480296, 3.0652847421361877, 3.0658846676173317, 3.066694679393177, 3.0709844242776003, 3.0709844242776003, 3.0770763982101377, 3.0791043058014713, 3.081024951916447, 3.0811286881718134, 3.082973811653777, 3.08496670783892, 3.085849848513032, 3.0858988602423127, 3.0863629747040147, 3.089384744628618, 3.08989147775578, 3.092105727925382, 3.0923423090864257, 3.0941773527656866, 3.0953092949457464, 3.099474363675413, 3.1006006276296554, 3.101405181825757, 3.10201512613665, 3.1034050798609885, 3.1037674887670907, 3.106272180951777, 3.106471378574924, 3.1068108265484735, 3.107019059114162, 3.1071762934786142, 3.1107583757482984, 3.111138403114521, 3.111680271953007, 3.1171786705936655, 3.1175360183238623, 3.1180425166785612, 3.1190098166243105, 3.1200741933894554, 3.1202986231711476, 3.1203614108332536, 3.121526432370873, 3.1221351509378787, 3.123347673996517, 3.124285306840236, 3.1250335774419886, 3.1250335774419886, 3.1263416800039856, 3.128177505634599, 3.128177505634599, 3.133288961800845, 3.1335902052482476, 3.137381904744724, 3.137381904744724, 3.1425000150094164, 3.146191886087655, 3.14710483113758, 3.14710483113758, 3.147154143139703, 3.147154143139703, 3.1486243431875267, 3.151575472746004, 3.152277017583397, 3.1539138851508453, 3.1550513405242486, 3.1550513405242486, 3.158884175891248, 3.1617103066713574, 3.162185581998394, 3.162185581998394, 3.164061432025233, 3.166049966125077, 3.1663628071350782, 3.166655936311398, 3.1682146347750937, 3.1682146347750937, 3.168813537612053, 3.170042809493298, 3.1751310172672556, 3.175522703387523, 3.1797932974183336, 3.180493395276068, 3.183139641128512, 3.18351023105695, 3.1874165216113455, 3.188625162296964, 3.189582714429944, 3.1902253012798054, 3.1908100501714878, 3.1908559134398398, 3.191015414205854, 3.1915292164308826, 3.1928949746993784, 3.1944318045242808, 3.1960644408536467, 3.1960644408536467, 3.19667626965765, 3.1969174874573394, 3.1977934842758917, 3.1995707894496737, 3.2014268295999067, 3.201753394015261, 3.2021724114305434, 3.2022939555839502, 3.2038618409646604, 3.2046017475292796, 3.204757713442399, 3.2052415921992172, 3.205972852394941, 3.2067117854179825, 3.207406444683767, 3.2083521783727793, 3.208411231656519, 3.208594926616955, 3.2093484467513381, 3.21208267654767, 3.212304578527689, 3.2128186320938568, 3.213342088842001, 3.2144387945667146, 3.214471097448553, 3.2161019989267317, 3.2163924125734646, 3.2164696555735857, 3.217745711302139, 3.2198193813870803, 3.2198545862837675, 3.220022088113345, 3.2202037799701446, 3.221769966373084, 3.2218972694295696, 3.222860815025063, 3.222860815025063, 3.22318530525785, 3.2241219398072043, 3.224460189350741, 3.225211679474795, 3.225236249359981, 3.2263264633873825, 3.2272642630328567, 3.227685302404386, 3.228968494218281, 3.228979462552935, 3.230248396563704, 3.2309110436475104, 3.231325399426236, 3.231382724329337, 3.2317356875299215, 3.232019362487858, 3.232590040458245, 3.232759977381274, 3.23311795187680, 3.2338021130955417, 3.233838213538831, 3.234025631612477, 3.235869854363506, 3.236206854343834, 3.23817140667629, 3.2384747821198236, 3.2390816169648753, 3.240343185913707, 3.2413568727601088, 3.2416337091841436, 3.2416337091841436, 3.241634035952722, 3.241765978150536, 3.2421808518211472, 3.2423453300974145, 3.242401191196873, 3.2431459645552767, 3.2438763914978623, 3.244497304325677, 3.2449811423332995, 3.2450544328225769, 3.2455528591262524, 3.246016016759647, 3.2464220242905695, 3.246893579695857, 3.2481710502336796, 3.2484485232706075, 3.2485648687508655, 3.2497015722778073, 3.250247014411143, 3.2507102541446176, 3.2510297597343465, 3.251144725811306, 3.252838703865461, 3.253043397715406, 3.254151586925435, 3.2548430503915675, 3.2551618820396175, 3.2556091231022584, 3.2556685823370106, 3.25607712427884 6, 3.256077124278846, 3.256490198327105, 3.257041183099743 4, 3.257204263022484, 3.2580932882036993, 3.2580932882036993, 3.258283586377908, 3.2585682430406706, 3.2585767869298974, 3.258977494325811, 3.259091398256131, 3.2599120189876336, 3.260377438861165, 3.2610467910371006, 3.2611628351391517, 3.262399839307268, 3.2625689467022343, 3.2626206028165265, 3.2629829372933985, 3.2630836116125668, 3.2633601750993986, 3.2639750586756358, 3.264344827860575, 3.2647104500715076, 3.264737064999392, 3.26486255534835, 3.265135360159999, 3.2661816296507484, 3.2661816296507484, 3.266372217262899, 3.2667324434204676, 3.266942432266378, 3.2674279096875374, 3.2674970927216362, 3.267607512994104, 3.267704029960375, 3.2680793548155065, 3.268471331190833, 3.2686187910880826, 3.2690678196858833, 3.269200808566969, 3.27016684072467, 3.270198314790329, 3.270198314790329, 3.270812470516

1867, 3.271140485977052, 3.271140485977052, 3.2711414410302133, 3.271246129821193, 3.271745015004064, 3.2722828521577094, 3.2731026268647234, 3.273585325263775, 3.273824802751269, 3.2750715747939636, 3.2755964329377676, 3.27563285470263, 3.27708649900437, 3.277172748316911, 3.278422858082044, 3.278570613907002, 3.279516162527499, 3.2796563181395424, 3.279950780128557, 3.279950780128557, 3.280178198436026, 3.281174629683331, 3.282440067406965, 3.2829579923489876, 3.283722430949396, 3.2848340297022594, 3.285121432205243, 3.285336246479364, 3.2856932666153984, 3.2873400417478025, 3.2873474492901438, 3.289260639290479, 3.290625077017175, 3.2907485333230873, 3.2933904853325333, 3.2940895908983956, 3.295229337214056, 3.295995514686659, 3.295995514686659, 3.297554736592872, 3.2975974202089646, 3.2999546524599457, 3.3024629935227483, 3.303780920963135, 3.303918248710974, 3.3064442732296144, 3.310715282435059, 3.3117047472041157, 3.3123706205932697, 3.314493608236483, 3.314493608236483, 3.3162279526968357, 3.31635975049422, 3.3165428552195015, 3.317060880703942, 3.3177030229572564, 3.3185780453325666, 3.3185780453325666, 3.3190962014395686, 3.320117268360087, 3.3201815036692053, 3.3207179877595476, 3.3207179877595476, 3.3210659694742657, 3.3215346981262512, 3.3216189055793492, 3.3216420701236142, 3.321676014015142, 3.321723780528758, 3.321837818127251, 3.3240760226444572, 3.3250253791569624, 3.3259766166460785, 3.3262895685886043, 3.3280622196755103, 3.3283069559065743, 3.3283709893127074, 3.3292571117482206, 3.3311558438576987, 3.3311558438576987, 3.331473581732013, 3.3321452729348557, 3.334188095369911, 3.334485343825363, 3.334930474973399, 3.3356461495687717, 3.336677060781191, 3.3370550701765005, 3.337654779889907, 3.33817125442067, 3.33817125442067, 3.3383341917219598, 3.3384050110235126, 3.3391813074996857, 3.3391813074996857, 3.3394970379344713, 3.340167658715521, 3.340619536540337, 3.3408802883869346, 3.341521914527478, 3.3424894393785585, 3.3426044199300198, 3.343805050197905, 3.344661291098091, 3.346793716576183, 3.3472257691039538, 3.34742262748272, 3.3475774724687817, 3.3477475022111505, 3.3479953154653623, 3.34880870037135, 3.349453412513311, 3.349764687734422, 3.350189113075486, 3.3502259577759284, 3.3502259577759284, 3.3504324362189384, 3.3518468414204774, 3.3519896957041233, 3.3526445471397186, 3.35397576434363, 3.354562327470701, 3.355542230656884, 3.355596619991561, 3.3558898739239, 3.3564011783754566, 3.3575403213203905, 3.35784864459691, 3.3585182020927116, 3.3590792570524095, 3.3591117424845907, 3.3591117424845907, 3.359216556165427, 3.3593541997314373, 3.3601306375753466, 3.3601306375753466, 3.360169925696539, 3.3608002149770235, 3.3608530287839393, 3.3608925544456447, 3.361187876008052, 3.361392686365908, 3.361439563328095, 3.361439563328095, 3.3620772183804566, 3.362817089222828, 3.362901673084675, 3.362937761755367, 3.3630726623899263, 3.3632705208357874, 3.363691858816557, 3.3638247372331374, 3.363888796840338, 3.3639813367302893, 3.364201699486203, 3.36445514458068, 3.364734411790152, 3.3648734780080036, 3.3653252480319193, 3.3657087071530616, 3.366035300675767, 3.366035300675767, 3.366239054638247, 3.3668110938429723, 3.367407329029525, 3.3677277293884393, 3.368613202488082, 3.3701400789748206, 3.370517425682428, 3.37082560624338, 3.37082560624338, 3.3709523163452664, 3.3710092940436307, 3.3710092940436307, 3.371264635110271, 3.3713347492231343, 3.371667697480978, 3.372573973760939, 3.373077480418655, 3.373205369694358, 3.3737633211774916, 3.3747801399163584, 3.3748759552467975, 3.3748759552467975, 3.37522583852618, 3.3755380933941295, 3.375590745354907, 3.3758364294803065, 3.37601437396178, 3.3760309839393834, 3.3760587722646624, 3.3762983370518413, 3.376356367927825, 3.3764560702110926, 3.376762406848785, 3.3768703258121686, 3.377180542202554, 3.3772214753400274, 3.377277398161433, 3.3774843987733956, 3.3779640015391768, 3.3781027083697803, 3.3781391470460624, 3.378504344510228, 3.378504344510228, 3.378812270579644, 3.378849190250071, 3.378988439694122, 3.378988439694122, 3.3791858413200284, 3.3797785872776016, 3.3804127224006524, 3.380772266265881, 3.381143445641872, 3.3813352112528996, 3.38135193190511, 3.38135193190511, 3.381439755504606, 3.3821483355768227, 3.3821483355768227, 3.382491038549898, 3.3825460364253190, 3.382565093756098, 3.382565093756098, 3.3825670771300795, 3.3827003505012545, 3.38280128460501, 3.38280128460501, 3.3828323658360726, 3.3828713650125666, 3.382971458349526, 3.383538993087563, 3.3835638969283073, 3.383814487626987, 3.3846576596176976, 3.3846954224517884, 3.3851468037928525, 3.385390249494035, 3.385390249494035, 3.385731461098094, 3.386074754829594, 3.3861436843231183, 3.3865479867450365, 3.3865479867450365, 3.38666202172607, 3.386692626649417, 3.387124410268938, 3.3873505949933538, 3.3874201561640955, 3.3878946438396813, 3.3879625892054537, 3.3885284352660547, 3.3886115499832505, 3.388635590949558, 3.38893936997384, 3.389775125504033, 3.3900654760065043, 3.390404892942112, 3.390404892942112, 3.3911151993985102, 3.3912425708792635, 3.3914729898457066, 3.391816217262478, 3.392155189143935, 3.3921750730847564, 3.392487270288163, 3.392876144586484, 3.393212187002157, 3.3934727531670785, 3.3937618389620283, 3.3937618389620283, 3.3938985764199012, 3.395348258921786, 3.395381666480388, 3.3956577535441994, 3.3959380493580804, 3.396100671366189, 3.3968124777310393, 3.396885389966755, 3.3971184052049965, 3.397330384333299, 3.3974566343398784, 3.397552561138216, 3.397696022164733, 3.397734037610981, 3.3979264520049854, 3.3979546615688303, 3.398005174792798, 3.3986907462488283, 3.398931392302063, 3.3990829060745944, 3.3997358939914117, 3.3997358939914117, 3.400074023437407, 3.4001667581579595, 3.400307886862157, 3.400307886862157, 3.400701501335885, 3.4007816525854997, 3.40086507994952

6, 3.401055382822085, 3.401162918870423, 3.4018008461306914, 3.4020783988189462, 3.4025787074250355, 3.4027422161552408, 3.4030
86918102257, 3.4032062666967233, 3.4032335433957814, 3.403424375734649, 3.403553502538308, 3.4041721215064973, 3.40424214677273
57, 3.4042421467727357, 3.404477195122831, 3.4050694298398168, 3.405210247876639, 3.405335921779427, 3.4053630845626146, 3.4057
8375769456, 3.406154185102474, 3.4063741082083037, 3.4067432729277525, 3.4067439340726775, 3.406761193679414, 3.406894290521137
7, 3.4069678458133357, 3.4072694785156696, 3.4073208863606523, 3.4074910834620242, 3.4075027041302874, 3.408079139036396, 3.408
087362297522, 3.408087362297522, 3.4081629927626067, 3.408277576283192, 3.4083983106130984, 3.408516698285816, 3.40891252421405
8, 3.4090173202061784, 3.409076583048595, 3.409077552504829, 3.4092039194403014, 3.4093574316922837, 3.4093574316922837, 3.4095
47929287629, 3.409630701214695, 3.409630701214695, 3.409793296995603, 3.409793296995603, 3.409855227312782, 3.410090375707296,
3.41058586036002, 3.4106812550616863, 3.4116431609625275, 3.4117028480878266, 3.4117277732065827, 3.41206481056414, 3.41303804
16737345, 3.4131115885242176, 3.413260909190686, 3.4136434274878558, 3.41373798216518, 3.413837251125873, 3.413853047257577, 3.
41401330651053, 3.4141224075644594, 3.414556099939098, 3.41459735183185, 3.414639948768868, 3.414644069131807, 3.41474693628659
05, 3.4147677519920543, 3.414810186410145, 3.4151571963986136, 3.4151624838806622, 3.4151690697574826, 3.4153473562225507, 3.41
5418718244242, 3.4155204015811766, 3.415560444376541, 3.415658176549468, 3.416056361510805, 3.4162968073791733, 3.4163230319449
074, 3.416884330642334, 3.4168959397920142, 3.4168959397920142, 3.416930179597533, 3.4169801368272767, 3.417784431372872, 3.417
8246112975557, 3.4178576673474765, 3.4179128404488184, 3.4179261994283627, 3.4185543458150693, 3.418584517116609, 3.41860592147
4602, 3.4189077639400254, 3.4189077639400254, 3.418917345326176, 3.4189741841539076, 3.4196088246617733, 3.4198223480500665, 3.
420099253591284, 3.4201572986161026, 3.42049715403983, 3.4205059316673934, 3.4205795294424997, 3.4209093508226727, 3.4218862993
63361, 3.4223333427431486, 3.4224289059166773, 3.422447542795127, 3.4226101568318037, 3.4227594875633787, 3.4242720506939808,
3.424516514600509, 3.424539599672057, 3.424575739806162, 3.4252270429584013, 3.42587696824681, 3.4263093331670023, 3.4263531584
82974, 3.4268027938615035, 3.4268027938615035, 3.4269221446954092, 3.427824763727238, 3.427885834860075, 3.428007855711001, 3.4
28558369512604, 3.429823908940392, 3.4302427806535705, 3.430634354505291, 3.4318852489374545, 3.4319106269428143, 3.4319106269
428143, 3.4321359679998205, 3.432142856157915, 3.4322968213173857, 3.4334450600059254, 3.433773602595051, 3.433773602595051, 3.
4344821419599785, 3.435013115498684, 3.435210403934515, 3.435210403934515, 3.436721184257329, 3.436721184257329, 3.437098316254
551, 3.437222528649438, 3.437473720700305, 3.4383497955034343, 3.4384201769360963, 3.439597363147066, 3.439652828069631, 3.4396
785690147866, 3.4396863605046795, 3.440708062892877, 3.4409940025051546, 3.441078567995292, 3.441195062678805, 3.44140159646082
56, 3.4427647675805595, 3.4429077987496277, 3.44304873437556, 3.444051589882183, 3.444051589882183, 3.444193915745198, 3.446681
163037105, 3.448056539695684, 3.450141876114464, 3.4501952503171065, 3.4508200148674257, 3.4515332670226866, 3.451710811217503
2, 3.4519644518977093, 3.452012134893019, 3.4522127893268646, 3.4522127893268646, 3.452340857574983, 3.4528307843040116, 3.4530
30227653852, 3.455029212046553, 3.4551695304431784, 3.455651045654613, 3.455651045654613, 3.456057424245881, 3.458209631148368
3, 3.458414849950713, 3.458616653409695, 3.4590650670973067, 3.4601974676757985, 3.4612918134687054, 3.4618880142964024, 3.4626
56957495236, 3.463311741006877, 3.4637542893582145, 3.4637872846230033, 3.4638450768882625, 3.4647318543733583, 3.4659428930866
465, 3.4676797606845624, 3.467784641471907, 3.4685309896366867, 3.4689461990805794, 3.4696124357605678, 3.4702081810244225, 3.4
70305250951547, 3.470975700855522, 3.4714367403373854, 3.4717488344368683, 3.471884993743815, 3.4720940810551926, 3.4729458265
636777, 3.4732955845034588, 3.473753503188526, 3.473753503188526, 3.47386078970119, 3.4738787861347173, 3.4747779678842083, 3.4
751553225483107, 3.47523152398137, 3.4753423151455847, 3.4758334086534353, 3.4759976407272735, 3.476419348404895, 3.47679388518
4969, 3.476808741017008, 3.4772508523650916, 3.477453636848401, 3.4780699708965126, 3.4781967772235776, 3.478526913962137, 3.47
92231809452093, 3.4796024587446, 3.479796660817449, 3.480678837304538, 3.4824971785144734, 3.4828940731300566, 3.483116814388227
4, 3.4831715173669133, 3.484000140718539, 3.484055799142189, 3.4844839287499276, 3.486488591230419, 3.486626517647467, 3.486775
328171405, 3.487266266004523, 3.487997983746647, 3.4880836496602257, 3.488255434201219, 3.4884467936334693, 3.488768574597506,
3.489097755412467, 3.4893721564669513, 3.4893721564669513, 3.4893879282194393, 3.489862974241449, 3.4901971964789125, 3.4901971
964789125, 3.4902813482632604, 3.4909367595008964, 3.4911772667185472, 3.491476509506606, 3.491476509506606, 3.491492432709989
7, 3.492003301995881, 3.4920941907153975, 3.4927095549173575, 3.4934173011906706, 3.4936094660212924, 3.493621366294302, 3.4936
334088366556, 3.494188111558852, 3.494188111558852, 3.495493814981968, 3.4957745819122557, 3.4971418394356877, 3.49717604558965
3, 3.4974983265713244, 3.4977396682656536, 3.4977979670798485, 3.5002902630591426, 3.5018309469633073, 3.5021668937064363, 3.50
2467279748338, 3.502934826267712, 3.5030784752210145, 3.5030784752210145, 3.503527786564177, 3.5035710920373853, 3.504038511495
646, 3.504107369279749, 3.5041641210010672, 3.504412442607838, 3.504503200277249, 3.504599554889603, 3.504998938511839, 3.50508

2728591029, 3.5055062615501598, 3.5055062615501598, 3.50568077326026, 3.5060546983457486, 3.506219910565354, 3.506219910565354, 3.506935194092594, 3.5073102049237113, 3.5082956253745516, 3.508803011263945, 3.509072539351012, 3.5092523136320315, 3.50925231 3632 0315, 3.5092871157157144, 3.509295233875016, 3.5093503501161987, 3.5116775462368834, 3.5124805324535417, 3.513377370804684, 3.513469163372911, 3.513469163372911, 3.513704364439405, 3.5137402470557633, 3.5143329074329825, 3.514560750494452, 3.514927485 2534997, 3.5150148026398433, 3.5150148026398433, 3.5155033173399026, 3.516209612010916, 3.516209612010916, 3.5162111218532046, 3.516561474525597, 3.516561474525597, 3.5168089660994766, 3.51757585667483, 3.517667422091065, 3.5179056328986293, 3.5182591132 05333, 3.519217681464169, 3.519217681464169, 3.519325900888138, 3.5194085076737527, 3.520154214887417, 3.520154214887417, 3.520 357268713127, 3.520357268713127, 3.5209007326806976, 3.520903738703368, 3.5209184003235428, 3.521311846361263, 3.52144863412584 6, 3.5214499702347957, 3.5214731663481946, 3.52148663225951, 3.5215440686344963, 3.521563274922542, 3.52160115251781, 3.5216011 5251781, 3.521951140453087, 3.5222186966991664, 3.5226779190533004, 3.522702865365143, 3.523031059374808, 3.523131656367735, 3.5239143529788617, 3.524095310450688, 3.5240988373169038, 3.5244463552512353, 3.5244463552512353, 3.5245648560391665, 3.524582 9874847696, 3.5245829874847696, 3.5248330809092465, 3.525343526312191, 3.525687360154484, 3.5262997695334217, 3.526969308164607 4, 3.527480729203753, 3.527480729203753, 3.5276841043194285, 3.527961475432556, 3.5281130573821198, 3.528273230174373, 3.528422 9772298636, 3.5285659266645966, 3.5285734793213956, 3.5285758954611293, 3.5287225866267367, 3.528732264927645, 3.52902575431394 5, 3.529033084006277, 3.52912846220832, 3.5292247500762426, 3.5294034252927173, 3.5297232360713835, 3.529938301774672, 3.529976 8537669274, 3.530023959244972, 3.5300631960460915, 3.530358477671302, 3.530360407977398, 3.530663231347996, 3.5308608708661984, 3.5310981638196, 3.5310981638196, 3.531207519311416, 3.5312784914182247, 3.5312795774125108, 3.531547052506937, 3.5316360077092 45, 3.5317618111455946, 3.531927657102135, 3.5322427669383787, 3.5323782308297123, 3.53251239779469, 3.53251239779469, 3.532676 0014424408, 3.5326805762183047, 3.5326805762183047, 3.5327184086066254, 3.533015084354944, 3.533092127014343, 3.533215837086817 4, 3.533251647157047, 3.533477351598256, 3.5337003945524286, 3.533751234030375, 3.533784736672407, 3.5338696804372307, 3.534199 2882115267, 3.534206293753111, 3.534547852442111, 3.534601829557681, 3.5346529334678, 3.534708814485187, 3.53516109016 04826, 3. 5354275950118232, 3.5354275950118232, 3.5355046883787424, 3.535536815964263, 3.5359572877081726, 3.5360695926717356, 3.53613310 22019966, 3.53629182838046, 3.536487579283121, 3.536536623203783, 3.5365924527001096, 3.536592611030475, 3.5366516541457793, 3. 5369862502488694, 3.5370448900614524, 3.5371064299457364, 3.537181539530624, 3.5373429352782964, 3.5375369891472497, 3.53781613 82042506, 3.5380663580467564, 3.5385900057109736, 3.538756523415572, 3.5390300028792487, 3.539462450288537, 3.539462450288537, 3.539546840559134, 3.539791861782231, 3.5398040053602196, 3.5399414153927657, 3.53998801640511, 3.5400540829146125, 3.540156624 0110824, 3.540332227302088, 3.5406555830108757, 3.540760158230259, 3.540760158230259, 3.540761018137003, 3.5409007901286818, 3. 54107494 0527943, 3.541460245579433, 3.541680269529026, 3.5425258998794966, 3.5426670644845877, 3.5427249257110813, 3.5433647693 93927, 3.5434428839162564, 3.543467128029369, 3.5436026708649937, 3.5436026708649937, 3.5436187570793214, 3.544063688523268, 3. 5441632987010916, 3.5442238228478393, 3.544511398199402, 3.544700893459416, 3.5447156308449026, 3.5447324549465065, 3.544983692 4084233, 3.544993221321973, 3.545098585153197, 3.5451176243208797, 3.545187125584418, 3.545195892754939, 3.5452313988808974, 3. 5452325601491634, 3.5454718634959055, 3.5454718634959055, 3.545538313542629, 3.545609267615571, 3.5456229514267914, 3.545627463 8695136, 3.5457757650617983, 3.546019772418626, 3.546019772418626, 3.546074191920913, 3.5460775773700892, 3.5460867037480717, 3. 5460920161662712, 3.5460920161662712, 3.5461563013392023, 3.546341846280361, 3.5464737961122954, 3.5466442479559848, 3.54667350 820141, 3.546680102905122, 3.5467214975279666, 3.5473758770872656, 3.5474206320415194, 3.548003646501589, 3.548317141670065, 3. 5486946120177336, 3.548732560091155, 3.5488742879209254, 3.5491624252952043, 3.5494356134098632, 3.5494791171316318, 3.54955266 88396897, 3.549892152098565, 3.549907967588693, 3.5499937157946677, 3.5500417000701017, 3.550390551985597, 3.550522208075743, 3.5507151126807446, 3.5507151126807446, 3.550723842239695, 3.5509363274068964, 3.5510748421671585, 3.5511131801078393, 3.551242 114475675, 3.5513065713897958, 3.5513849521413285, 3.5514897683461997, 3.5518992007135326, 3.552006520901374, 3.5521065656121396, 3.552421069279239, 3.5524267769701736, 3.552706721372852, 3.5528074699751344, 3.5528900894920756, 3.5528900894920756, 3.5530 16130681623, 3.5530722150066 33, 3.5530973079406207, 3.5530977689336822, 3.553108229677135, 3.5532843128105025, 3.55329850504999 06, 3.5537736469079193, 3.5540113829828868, 3.55410609750419, 3.5541607171704337, 3.554193018607499, 3.554591692749943, 3.55478 38550918485, 3.5548354926958448, 3.5549725499521827, 3.5550445577636975, 3.5550915070505993, 3.555244547507207, 3.5552839033279 93, 3.555297897423323, 3.555297897423323, 3.555374777925884, 3.555436098391619, 3.5554465036053737, 3.5556413137201637, 3.55587 1917251178, 3.5559702892998364, 3.5561275599582594, 3.5561275599582594, 3.5561880175426483, 3.5562737006783247, 3.5563080963725 255, 3.5563410335532106, 3.55643570307494, 3.55643570307494, 3.5568658838900307, 3.5568658838900307, 3.5569131646450285, 3.5571

1266323944, 3.55711602141942, 3.557147827213158, 3.5574365155972774, 3.5575576051158952, 3.5576546815962042, 3.5578550502535964, 3.5578550502535964, 3.5579366725174424, 3.55795137522805, 3.558029480884985, 3.5582233812318913, 3.558270816377793, 3.558310625056669, 3.558588209498421, 3.5586198549662664, 3.5586291235273864, 3.5586314327040762, 3.5589940618149902, 3.559039881424546, 3.559121206759504, 3.559180909066976, 3.559259803573673, 3.5594954676864177, 3.559611740853497, 3.5596224949831106, 3.559773139749814, 3.5599151247213765, 3.559929128951964, 3.560108083713433, 3.5605159264539283, 3.560595651567449, 3.560683681736794, 3.560699827029172, 3.5607061770755553, 3.5610301007659295, 3.561430769785632, 3.561817169013873, 3.561817169013873, 3.5619312216284165, 3.562599849154925, 3.562619307841584, 3.5626372972310048, 3.5629907689217193, 3.5631683502777127, 3.5632272142528807, 3.5635182071453566, 3.5635182071453566, 3.5635215309730532, 3.564069028837021, 3.5644023133755596, 3.5645323975441308, 3.5648794564272963, 3.5650169250090546, 3.5651819997453735, 3.565204141214294, 3.56528066252585, 3.5653746910792674, 3.5655308521335733, 3.565676873665385, 3.565736969437593, 3.5657432435556444, 3.5658807964906454, 3.5659202044444513, 3.5659646477961333, 3.5671677075737565, 3.5672338750599035, 3.5673710845475655, 3.5674063851070437, 3.5677701016999848, 3.5678515225616554, 3.567908059646649, 3.567995687527191, 3.5681625023298364, 3.5682863904508397, 3.568528499277242, 3.568528499277242, 3.5688205825209462, 3.568820645019608, 3.569014406589956, 3.569278438524299, 3.569423438415349, 3.5696591117785754, 3.5699743248259255, 3.5701446369184344, 3.5701446369184344, 3.5702088091243565, 3.5702953558990367, 3.57038323803364, 3.570478776780626, 3.5706113392780185, 3.570742903119728, 3.571854131147889, 3.572189173446908, 3.572245166907824, 3.5725753984284214, 3.573574959102605, 3.5740535808686613, 3.5740535808686613, 3.5741051579599694, 3.574546628667304, 3.574573095694043, 3.574573095694043, 3.5745766880356693, 3.5747386652897895, 3.5747386652897895, 3.5749564279754, 3.5752091585202344, 3.575402507183717, 3.5754184574647496, 3.5756092670604063, 3.575614486989906, 3.5770024182161735, 3.577148722113349, 3.577544345449059, 3.578830597446502, 3.5790695321990285, 3.5790695321990285, 3.5792964045185087, 3.579396919242509, 3.5794493702219174, 3.579561097049914, 3.5796292996017667, 3.5796292996017667, 3.5813135547611896, 3.581391656978947, 3.5815268613533866, 3.5815418462414335, 3.5827997214697773, 3.5832587593513305, 3.5835035069787113, 3.583953340294907, 3.583955763751246, 3.5841201491402557, 3.584299414935321, 3.584610872713305, 3.58606067275896, 3.586941134274367, 3.5871708054964047, 3.587933525419901, 3.588098158491071, 3.5883226808637327, 3.588615808151719, 3.5896985820561196, 3.5900399590145557, 3.5900399590145557, 3.5907868577658872, 3.5914420895085315, 3.59151761538482, 3.5915370391506385, 3.591675330695363, 3.592049176864855, 3.5920800804225776, 3.59227022686280158, 3.5925472503063705, 3.5925472503063705, 3.5928483931407467, 3.593272705092024, 3.593695865095808, 3.594923842076155, 3.596293218476753, 3.596319757964931, 3.5963227234952253, 3.596505617528312, 3.5976737091446402, 3.5984754447138125, 3.598581473443847, 3.599395218899899, 3.6002423752866326, 3.6002492922232361, 3.60140583455304, 3.6023486405160923, 3.6026682235258334, 3.6031463499433, 3.6032834712733646, 3.6041517991122363, 3.604467121245817, 3.6044907779921123, 3.6050750295097393, 3.605649698568622, 3.6079012776238373, 3.6079012776238373, 3.608750528518319, 3.610129626898603, 3.6107384369759394, 3.6112103434759835, 3.6121721481166142, 3.612352458302161, 3.6125247957663675, 3.61269220311446, 3.61269220311446, 3.6127840062196652, 3.6127840062196652, 3.6129821126101835, 3.6130297944509984, 3.61353966245668, 3.6137703118484277, 3.6145966738304067, 3.6150416198856234, 3.6153670636515947, 3.6154743655332022, 3.615636266886292, 3.6167332918161925, 3.6169456456263576, 3.617173618906071, 3.6174790645301638, 3.6184734077174934, 3.6187676546658616, 3.618831315579878, 3.6190688389755827, 3.619425176346809, 3.6195402167802144, 3.619741407453393, 3.6204448171679413, 3.621427342598908, 3.6216162107379697, 3.6217986909886086, 3.6219584063278787, 3.621966699532968, 3.6224340355891385, 3.623027498695597, 3.623027498695597, 3.623459744239395, 3.6234740950136706, 3.6238858465258104, 3.6239344781603156, 3.6239344781603156, 3.62421961475617, 3.6248963159313994, 3.6251046638633944, 3.6252854279167166, 3.6256736583656832, 3.6261984088145076, 3.6262295366161745, 3.626763659643036, 3.626763659643036, 3.62747924272434, 3.628078912222407, 3.6280857171643452, 3.628156488142078, 3.6282376040171505, 3.628638079281076, 3.629496912820572, 3.630231772044772, 3.630332066709039, 3.630616344812773, 3.630639388653869, 3.6306393886538 69, 3.631409641836409, 3.631855142723084, 3.631855142723084, 3.632480713296664, 3.632605000465711, 3.632775828368814, 3.632911967881753, 3.6331853675630734, 3.6338355417309423, 3.634524587796191, 3.634809407929567, 3.634822528204129, 3.6349427599167563, 3.6349647222348365, 3.6351774835709514, 3.6353443930744773, 3.6365652631199605, 3.6369728919001285, 3.6369868861088333, 3.63709880820558306, 3.637459955454283, 3.6374797396543843, 3.6374797396543843, 3.6377648344832334, 3.6380158288532827, 3.6380158288532827, 3.638658237270653, 3.638680351418319, 3.638680351418319, 3.638860621290311, 3.639067567065154, 3.6391022894356597, 3.6393785170615875, 3.6394841353022107, 3.6395542835201034, 3.6396240260656363, 3.639727946503132, 3.640842173319323, 3.6410781726878376, 3.6414531564554613, 3.641701589400506, 3.6418124620996686, 3.642512745410652, 3.642544231473569, 3.6425945768009096, 3.64273028092956, 3.6427625945179627, 3.642846679999312, 3.6435088945576384, 3.643555385000513, 3.643736397399796, 3.643922

03911426, 3.6441122632115914, 3.644266739312231, 3.6443190170611093, 3.6443445141866557, 3.6450322224397578, 3.6450775881530557, 3.645078545662778, 3.6452043772574547, 3.646124884394770 7, 3.6462482320394085, 3.6465080055375028, 3.6467235848530355, 3.6467235848530355, 3.6468367016316785, 3.6470622426618386, 3.647121406834093, 3.647154685220722, 3.6474010566613244, 3.6474875449363764, 3.6474875449363764, 3.6477927888156687, 3.6477927888156687, 3.6478293424271215, 3.6479083001597523, 3.648003348174706, 3.648003348174706, 3.648386868553046, 3.648512797531152, 3.6486153428077834, 3.6487465215428894, 3.6488638968996483, 3.64895254470173, 3.6497387306635707, 3.64976190449327, 3.6497634561179755, 3.649887199991054, 3.6500274054523847, 3.6500274054523847, 3.6501521753640653, 3.6504403309657665, 3.6507720197623423, 3.650804107061407, 3.6513884201532534, 3.651724926083722, 3.6518125096893352, 3.6519037102382557, 3.6521193462128188, 3.652396804646429, 3.6524460677897603, 3.6524905406488593, 3.652544576889105, 3.652703754249698, 3.6528089313212604, 3.6528089313212604, 3.653033009641078, 3.653040903465888, 3.6539367283873467, 3.6540459174274313, 3.6543199216930726, 3.6545317724569277, 3.654597469306652, 3.654611345188258, 3.654693901192587, 3.655050317473014, 3.655170931325663, 3.655354829627134, 3.6555043360017914, 3.655600788849328, 3.6556457770819293, 3.6558417134009384, 3.6560525017799295, 3.656155029847006, 3.6566718434187138, 3.656918811212457, 3.6569977622410774, 3.6571021928090826, 3.657239996876836, 3.6572511848904425, 3.6572511848904425, 3.6577914398673808, 3.6578891369045086, 3.6579647965641673, 3.6583426724421937, 3.658719009340682, 3.6587336084167466, 3.6590597946952235, 3.6595487773607305, 3.659609833647842, 3.659609833647842, 3.6596185881354795, 3.6597606123294484, 3.659781472154168, 3.6598030649508217, 3.659949983019772, 3.659978531103525, 3.660246465784459, 3.6602464655784459, 3.660309401369261, 3.6604214413516876, 3.6606127235945634, 3.6606127235945634, 3.6607350120863495, 3.6607467383589727, 3.660781478883163, 3.660781478883163, 3.6610146758474276, 3.6611832211151834, 3.661741749625149, 3.6619970335010437, 3.6623463863417607, 3.6629155892078877, 3.6631499553669276, 3.6634384427909996, 3.663543909844814, 3.6637679130370895, 3.6638093546291803, 3.6641128629437247, 3.664430633594286, 3.6645510075181997, 3.665086869572824, 3.6653578224049, 3.665706509372208, 3.6658379845006003, 3.6659728876173734, 3.665985721130662, 3.6662188747207862, 3.666399948204573, 3.666707185344493, 3.6667288527190616, 3.666791721548002, 3.6670432181515786, 3.6670432181515786, 3.667133570244519, 3.667158366349035, 3.6674052953986154, 3.66750637580846, 3.667598022281011, 3.667712892702675, 3.6678598952930637, 3.6680152368879133, 3.6680152368879133, 3.6687418222669743, 3.668780502242862, 3.669011000117586, 3.669112366052894, 3.6691649809012143, 3.669180153558919, 3.6692024443145783, 3.6693232135234148, 3.6694032860054664, 3.669532359184066, 3.669600946349738, 3.6696563069546584, 3.669666529643417, 3.669798781803419, 3.6701578297363926, 3.6701578297363926, 3.6702546972688954, 3.6703243518577113, 3.6703432040342894, 3.6703789786092007, 3.6706457935951344, 3.6709087229975963, 3.671047815428196, 3.67110116760047, 3.67118680125448, 3.6716851888453754, 3.6720899751256924, 3.6720925288208823, 3.672395719476409, 3.672445444191591, 3.6724666256862846, 3.6725789616356135, 3.6725789616356135, 3.672589636228339, 3.6731434755286028, 3.673287512361441, 3.673314618185237, 3.673314618185237, 3.673348882574402, 3.673431203106585, 3.673490263693575, 3.6738186273759688, 3.673859692580341, 3.673862468493455, 3.6739303897696245, 3.6739443629669135, 3.674302589735716, 3.674322852578636, 3.674507488303338, 3.6745739202742236, 3.6746345534196085, 3.6746571923719498, 3.6746922709646443, 3.674810701027368, 3.6748593233830302, 3.6749107413774373, 3.6752061769886626, 3.6752906919313157, 3.675517426601925, 3.6756798303068696, 3.6756959970671682, 3.6757161932751643, 3.6759859363044054, 3.676320294504472, 3.676367127759327, 3.676419296730886, 3.6767285485579193, 3.6769016738079823, 3.6770321274493463, 3.6770825945109915, 3.677114883549679, 3.6771250868338075, 3.677183806182939, 3.6771915332771385, 3.677228668914996, 3.677279488204112, 3.6773558093455816, 3.6779759378190895, 3.678075254142101, 3.6782769627168963, 3.6783580424407383, 3.678407161216772, 3.6784531941438847, 3.6784932124350136, 3.679119159588929, 3.679119159588929, 3.6791775069578962, 3.6792889712669426, 3.67945059623948, 3.679451788675249, 3.679712819476191, 3.6797201114432996, 3.6797240952378765, 3.679818045278189, 3.68001193981203, 3.6802961450280454, 3.6810039137040653, 3.6811573791493992, 3.681158486565725, 3.681158486565725, 3.68127760520207, 3.6814008090479393, 3.681401217726788, 3.681401217726788, 3.681409659257548, 3.6814194527191377, 3.681420331485954, 3.681622803980058, 3.6821271039879337, 3.6823398822391575, 3.682343211286178, 3.6824056654444471, 3.6824630752724357, 3.6825199523429353, 3.682644400616681, 3.682718924177406, 3.682848319055859, 3.6834649262366845, 3.6835563287307616, 3.6837544917315563, 3.6837809254597267, 3.683851848207197, 3.6840025411115223, 3.6840121909994346, 3.6840280562731618, 3.684072665342837, 3.6841049215368944, 3.6841527077325766, 3.684254551454499, 3.684265220381652, 3.6842652203816 52, 3.684332467945549, 3.6843670510902538, 3.6846017281628995, 3.6846086006811767, 3.684618482911135, 3.684633942966071, 3.6846339429660 71, 3.6848889438601153, 3.684936422761883, 3.6849582241542507, 3.6849582241542507, 3.684977659778826, 3.6850054575037645, 3.68510563486654, 3.6851304761313624, 3.68544276595155, 3.6855927111816436, 3.685736624423952, 3.6857760251689062, 3.6858328278056285, 3.6858466849197624, 3.6858466849197624, 3.6859726949693945, 3.6862521637707077, 3.6862524683735516, 3.68625246837355

16, 3.6862720821857566, 3.6862720821857566, 3.686343717985896, 3.6864125095269595, 3.6865033435310344, 3.6865208076812954, 3.686760150301088, 3.686834751542266, 3.6869392272115573, 3.6870667442752985, 3.6870865845394287, 3.687189112527597, 3.6874511434606947, 3.6875245804812384, 3.687583206181952, 3.6876893713881613, 3.6876893713881613, 3.68792869050294, 3.6882941963994793, 3.6883174750804466, 3.688513823086504, 3.688788088292614, 3.6888337982773947, 3.6889323707347046, 3.6889530240368043, 3.6889742729907873, 3.6889742729907873, 3.689067763012094, 3.6891336048346335, 3.6891960694538017, 3.6894482895822263, 3.689480350972639, 3.689696183667897, 3.6897059327858988, 3.6897059327858988, 3.6898935617104613, 3.6900469641485203, 3.6900542753891648, 3.690088021218462, 3.6901928062223117, 3.6903769821982384, 3.690484349850136, 3.6905243273438066, 3.690692621082966, 3.690692621082966, 3.690784968946423, 3.69083197564914, 3.6911078033080864, 3.6911574876325686, 3.691226013473161, 3.6912617661165656, 3.6912740408498004, 3.691386381015248, 3.6915640450399985, 3.6916316061391554, 3.6916873672407577, 3.6917176699033467, 3.691769481009488, 3.6919803434022316, 3.6920672015791314, 3.69225833705288, 3.6923176825797746, 3.6923608405379063, 3.6924584733619072, 3.6926092601364005, 3.692647684355927, 3.6928608465899777, 3.692984248555425, 3.6929980850248945, 3.6929980850248945, 3.693009195124143, 3.69303593855936, 3.6930712597059263, 3.6931248967183925, 3.6931405817699083, 3.6933602989516263, 3.6933602989516263, 3.6935151079604993, 3.693566084573612, 3.6936221087404966, 3.693681914397317, 3.6939255182969446, 3.6939456443574326, 3.694360918265464, 3.6943685729071616, 3.6943786884360468, 3.6947491852939773, 3.6947854652652965, 3.6950646244729564, 3.6954055200266986, 3.6954055200266986, 3.6954676209999278, 3.6954878210927817, 3.6955231504179533, 3.6955317443330697, 3.6956102558496657, 3.695665372655765, 3.695685799176816, 3.6957117511278645, 3.695780970124056, 3.6959564965498086, 3.695965042618574, 3.696108206763599, 3.6961575398142394, 3.696205231995452, 3.6963542192269037, 3.696418301283801, 3.6964873567921557, 3.6965348911804847, 3.6965348911804847, 3.696540309248144, 3.696574524766194, 3.6967337116684584, 3.6968503469219667, 3.6969514525460774, 3.6970829363709905, 3.6970829363709905, 3.697102174891691, 3.697134402470312, 3.697362027279075, 3.697524610077209, 3.6981055583443867, 3.6981523818165725, 3.6982309904949777, 3.6982594010831686, 3.6982842688290427, 3.698336443321612, 3.69835794397513, 3.6984325167983885, 3.6985821996650747, 3.6987335992153145, 3.6988198721030927, 3.6988442674932305, 3.698875286542016, 3.698926173216379, 3.699192221045422, 3.6992287840556477, 3.699352114363724, 3.6995108072277216, 3.699639755657899, 3.6996817816412797, 3.699774582466497, 3.699981726690785, 3.7000019242649973, 3.700200393887178, 3.700210041383207, 3.7004227093755073, 3.700496473562925, 3.700632108312354, 3.7007678044659826, 3.7010470673752804, 3.701088106593869, 3.7012252643165433, 3.7012323226961454, 3.7017255675908776, 3.7017959602600246, 3.7019144679246403, 3.702008287137463, 3.7020272530492395, 3.7022396173201013, 3.7022396173201013, 3.7025187980588714, 3.7025534137473843, 3.7027150143802494, 3.702762394464906, 3.702901473122778, 3.7029870192560703, 3.703104103049489, 3.7032139374676065, 3.7032170796454453, 3.7033974339546303, 3.7037961469023895, 3.7038955392938395, 3.7039577587600268, 3.7039955396530466, 3.7039984024438253, 3.704043202933627, 3.704140483689595, 3.7042021952632718, 3.7043806747771164, 3.704692110248341, 3.704754353352458, 3.705484157134755, 3.705484157134755, 3.705672049332380, 3.705883434837164, 3.7061850658242976, 3.7068282201353626, 3.7068446657346015, 3.7072583517634135, 3.7073467657944175, 3.7079426420605404, 3.7079779731392914, 3.7080073534839184, 3.7081870264168963, 3.708372506152847, 3.708406086070953, 3.708563818382255, 3.708583812764769, 3.70880612224341, 3.70880612224341, 3.708837476209152, 3.7090338570595422, 3.7090338570595422, 3.709035582798233, 3.709091045321285, 3.7091658516016186, 3.7092827872168255, 3.709488455589249, 3.7096850717034475, 3.709787116604687, 3.7100947033940836, 3.7101332835188847, 3.7107252500986334, 3.7108319479098033, 3.710968032824014, 3.711009603917776, 3.711009603917776, 3.711389016851501, 3.7114848541280443, 3.7116858300525, 3.7117990749741017, 3.7120465275990244, 3.7123771903005065, 3.7124649501449025, 3.7125913873035383, 3.7130374388821784, 3.7138756727999906, 3.7140680835117066, 3.7147644716308523, 3.714895240974972, 3.7152096333430777, 3.715222211526377, 3.715474204445733, 3.7157459044458014, 3.7157739512103647, 3.716624939798513, 3.7167039313127113, 3.7170222683875758, 3.7173124556166273, 3.718758304698741, 3.718855124434881, 3.718879468777432, 3.718879468777432, 3.7201049547936993, 3.720949285517938, 3.7209652088011245, 3.7209652088011245, 3.721292028917084, 3.721418206923612, 3.721818389028101, 3.721879892619994, 3.7222817888964004, 3.7222817888964004, 3.7229236633761773, 3.723835205984676, 3.7239895321779306, 3.724205338475009, 3.7253714946951115, 3.725630138425826, 3.725928144451318, 3.7272944100896543, 3.7272944100896543, 3.728042175989191, 3.7283298690008655, 3.7285577460846793, 3.7293914164115463, 3.7295238277914025, 3.7295513758880476, 3.7298550704362863, 3.730106716141959, 3.7307236653386995, 3.7309485230976587, 3.7310885684935395, 3.7317215121485394, 3.7317215121485394, 3.73176715181463, 3.7318125583846964, 3.7327451718355023, 3.7327451718355023, 3.7329067253063783, 3.733283102255659, 3.7337236205474444, 3.73387197726094, 3.734392912045628, 3.735361550773925, 3.735488886743048, 3.735778207784487, 3.7361988228650826, 3.7370058092690206, 3.737264961782352, 3.737332995618824, 3.737332995618824, 3.7392361900067191, 3.7400431352192554, 3.7401146798373017, 3.7401653917062796, 3.740376741713975

5, 3.7406956031091543, 3.742014778013491, 3.742494322619529, 3.742494322619529, 3.7430460175616918, 3.743371810755581, 3.743636 0106465303, 3.74370613248068, 3.743862104083768, 3.744208046498643, 3.744282497773955, 3.746473108937352, 3.746484304121216, 3. 7466969765873364, 3.746850147175462, 3.747065785280204, 3.747564989051595, 3.7480473360974678, 3.7487329724453438, 3.7488655424 79242, 3.7491101314706325, 3.7494331751733685, 3.7494797295586535, 3.7495265153358615, 3.7496532844549586, 3.74967753672258, 3. 7498881268151587, 3.7509702165202268, 3.751046591312535, 3.7510629176618866, 3.751096312075605, 3.7513081237521955, 3.751380466 3667982, 3.751404562748934, 3.751404562748934, 3.751837388756584, 3.7519739721727885, 3.752091270485254, 3.7528346569062037, 3. 7528346569062037, 3.7528526778374465, 3.7529107077358628, 3.753153353212641, 3.753419440316838, 3.7535364194882272, 3.753739698 029145, 3.754360765552703, 3.7544528761364497, 3.7544796971569427, 3.7556149521241156, 3.756569202274219, 3.756691873330182, 3. 756863905492438, 3.7574493811851397, 3.7576195921110744, 3.757743186519366, 3.7579631450897555, 3.7582128703141544, 3.758609980 2431687, 3.7586099802431687, 3.7589155154437432, 3.759045762816839, 3.7596131055167943, 3.7596704428950662, 3.7596915730060565, 3.759729717305632, 3.759846236931901, 3.7601606880371126, 3.760903251297653, 3.760993594276368, 3.761926307634469, 3.7620077627 544912, 3.76221661884019, 3.762334541192945, 3.762749891715946, 3.762947074666551, 3.763383807661363, 3.763710752818057, 3.7645 003053973425, 3.764662970330638, 3.7647918580267343, 3.765692757190789, 3.765692757190789, 3.765786766568644, 3.76590869857898 4, 3.7660003316476587, 3.7660003316476587, 3.7664578496824155, 3.766513019601053, 3.7665364227050344, 3.7666562342435066, 3.767 0047961041844, 3.7673025214269455, 3.7674738488228674, 3.7677542401724, 3.767834290813764, 3.7678360487212226, 3.76792904532548 6, 3.7688512915341894, 3.769330567614297, 3.7695114270434864, 3.7695114270434864, 3.769597130421618, 3.769821944515525, 3.77007 32449471457, 3.770111313423513, 3.7702821566178932, 3.7703136976353293, 3.770550839607677, 3.7708589819377636, 3.77097175171065 05, 3.7716716115356173, 3.7718244625841675, 3.771859807523929, 3.7719813236691566, 3.772010538838387, 3.7724808887860872, 3.772 899759820084, 3.772959213574398, 3.7730041921671966, 3.7730538156042774, 3.773110655013453, 3.7735507426679735, 3.7735507426679 735, 3.773586521893202, 3.773697078235206, 3.77384895517377, 3.7739809277695513, 3.7740830009637243, 3.77455617391023, 3.774644 089692634, 3.7747094323373354, 3.7749407328306845, 3.774995892379382, 3.7752908405597867, 3.7756840417049524, 3.775859401168501 6, 3.7762642490188267, 3.7766877401819974, 3.776863786370708, 3.77687681759275, 3.77687681759275, 3.777209302680196, 3.77817212 4191325, 3.778182241159329, 3.7786780045889494, 3.7786877121613163, 3.7788205652393985, 3.77902763736976, 3.7793740919835033, 3.7797533843147084, 3.779800062694912, 3.7798003911546645, 3.7799913415372544, 3.780053112278216, 3.780054097145472, 3.7801190 94626489, 3.780119094626489, 3.780489802125584, 3.781219163911581, 3.7820264811222657, 3.7826342780632687, 3.782826472942241, 3.783474195972082, 3.7834851674158725, 3.783509606499422, 3.7836846358866927, 3.784207206882, 3.7843195617681933, 3.7844207801 72552, 3.7844462461605177, 3.784465312912783, 3.7848162483228176, 3.784852439646622, 3.784852439646622, 3.785131757622696, 3.78 52859232015468, 3.785330436453319, 3.785449571611998, 3.785492133328664, 3.7854999102241056, 3.785515359615465, 3.7855457895486 33, 3.7856201170282504, 3.785986693426718, 3.7860181528364083, 3.7861848337626802, 3.7863644146486797, 3.786678989332197, 3.786 7397474983555, 3.786914263979729, 3.786914263979729, 3.787280624378645, 3.7873924152944536, 3.7875225355122026, 3.7875476743907 757, 3.7876295909315743, 3.7876412509268014, 3.78786797001167, 3.7879287428918027, 3.788011071609963, 3.7883280967849333, 3.788 5900629995426, 3.7886128530714727, 3.7886466007707136, 3.788957343669324, 3.7892091523078957, 3.7893312120372205, 3.78935689170 3902, 3.789480637172203, 3.7895672428551133, 3.7900697223271176, 3.790143968926505, 3.790157488639992, 3.7902000413467802, 3.79 0221179156307, 3.7903958458428457, 3.790406329702985, 3.790686189794777, 3.7906963556083517, 3.790725956696552, 3.7908930317273 62, 3.790893031727362, 3.7909083142887554, 3.7909871528484738, 3.791253668109083, 3.7912628519921174, 3.7915550642605713, 3.792 03481213 01015, 3.7922687022971484, 3.792396690697749, 3.792396690697749, 3.7928912979658254, 3.7928912979658254, 3.792902763863 9266, 3.7931707311291616, 3.793232895316725, 3.793290619668091, 3.7933093017273403, 3.7933249162486025, 3.793334227583354, 3.79 39544064833712, 3.794066627486611, 3.794104920723678, 3.794493069290381, 3.79459714671079786, 3.7947054285589346, 3.794731775200 9666, 3.794807084052682, 3.7948693527062076, 3.794877424076504, 3.7949551694302732, 3.79548498454403, 3.7957072587096903, 3.795 7576087816878, 3.7957905412946427, 3.7959455960724897, 3.7959455960724897, 3.796143683640567, 3.7962216437914096, 3.79637115929 50196, 3.79649860658196, 3.7967405747987604, 3.796785609866224, 3.796785609866224, 3.7968557686798308, 3.7968779850642083, 3.79 7060390645346, 3.7971500620775425, 3.797222099410613, 3.797467292376772, 3.7976808508666373, 3.797815880550899, 3.7978591406154 03, 3.7979974719254055, 3.798055587064187, 3.798143265288093, 3.7981978282768014, 3.7982036759437294, 3.7983732537895047, 3.798 4658530236666, 3.7989257859211274, 3.7990550483904713, 3.799082177554574, 3.7993754234956496, 3.799548767256834, 3.799579482006 1333, 3.7997314955019528, 3.800013665511384, 3.80023068457449, 3.80024972925441, 3.800267505103552, 3.8003180977244835, 3.80041 90106239526, 3.8005602125669498, 3.8005662167644627, 3.8006562871898875, 3.8011306368186863, 3.8011484212432913, 3.801211863335

6984, 3.8015600813924157, 3.8017965045853424, 3.801843728923935, 3.80193824171712, 3.8023848468812407, 3.802475433405691, 3.8026024342154887, 3.802643303514721, 3.8026989177014157, 3.802781030415474, 3.8028344948833914, 3.80283784783007, 3.802984631056604, 3.8031480209909403, 3.8031480209909403, 3.8032159237330725, 3.8032160804199444, 3.803499816534051, 3.803499816534051, 3.8035062799329356, 3.80364122038489, 3.8036746597605284, 3.803711530222002, 3.803941037039441, 3.8040528792688835, 3.8041230970079303, 3.804221386264382, 3.804223721444002, 3.804399533770634, 3.8044705484828523, 3.8048230591593586, 3.8048230591593586, 3.8049542169775514, 3.8052345276254282, 3.8053092296338593, 3.8053205915536097, 3.8053309920266214, 3.8055259706702578, 3.8055640296341138, 3.8055640296341138, 3.8058077377583928, 3.805914776763851, 3.805914776763851, 3.8060596980641503, 3.806134090919601, 3.8061576609099275, 3.806159397347185, 3.8064769936597003, 3.8067412060129264, 3.8069176801394162, 3.8069472603705257, 3.8072008061179, 3.807232046768499, 3.807506040730701, 3.807771008232089, 3.807996404594798, 3.808250259523889, 3.808250259523889, 3.8084305388278508, 3.80844623758599, 3.808514156780478, 3.808532323933455, 3.808972352139021, 3.80897574224709, 3.809028306473253, 3.809165517391224, 3.809271057898237, 3.809804632739997, 3.809915243298418, 3.810032042856086, 3.8100768494581905, 3.8104329662272387, 3.8105704748042792, 3.8109445744750783, 3.811384000306064, 3.8114286486927953, 3.8114286486927953, 3.8115314910197986, 3.8115966258063327, 3.8116370048778254, 3.8118864427439307, 3.8118939672974204, 3.812163619047052, 3.8122461945624306, 3.812270437636991, 3.812306593879353, 3.8124948691472467, 3.812539354981519, 3.812539354981519, 3.812682792264131, 3.8132006798518558, 3.8132484830055073, 3.813289355243342, 3.813431048342068, 3.814049596213377, 3.814049596213377, 3.8145106143978547, 3.8145927606410726, 3.8146991145682287, 3.814860368421834, 3.814872477174205, 3.814889050440686, 3.8150478460088864, 3.8150530531512326, 3.8153042892540614, 3.8153100618255786, 3.815329820602095, 3.8154283899957213, 3.815558860270494, 3.815692597791647, 3.8157039048924406, 3.815788788393128, 3.8160257256748564, 3.81617345526608, 3.81617345526608, 3.8162712096977405, 3.816340309473901, 3.8164367799214527, 3.816486152700234, 3.816505981954663, 3.8165496364557625, 3.8165681472288098, 3.8168899088748263, 3.8169474230882856, 3.8171713441701587, 3.817181632829055, 3.8172515366625728, 3.8172858808686283, 3.8175168941259288, 3.8177061575280757, 3.8177384264316374, 3.8177723370767205, 3.817790869883354, 3.817954091415146, 3.817954091415146, 3.818223461085825, 3.8182424536406807, 3.8182751862173054, 3.818427148549705, 3.8184524026806805, 3.8184841813397, 3.8185102034288803, 3.8185451805530075, 3.8186019651692353, 3.818634770267368, 3.818634770267368, 3.8186716880470732, 3.818706284913242, 3.8187663194971933, 3.818888214061249, 3.8192508879872715, 3.8192927727753814, 3.819367463685, 3.8193985646733584, 3.819892279604555, 3.8199204784287346, 3.820043119295141, 3.8203073876568903, 3.8203073876568903, 3.8204230636792786, 3.820583212039412, 3.8206765351040977, 3.820741216375825, 3.8208428815260036, 3.820872580031197, 3.8209292999161404, 3.820957028615075, 3.820957028615075, 3.821088483506891, 3.821153045455311, 3.8212115347241986, 3.821346421753189, 3.821549203531288, 3.821729624319544, 3.8217358950119142, 3.8219063324232585, 3.8219335214876033, 3.822126397601753, 3.8222045771962714, 3.822331693360232, 3.822395002580153, 3.8224111843672346, 3.8224111843672346, 3.82243789062884, 3.8225480925569197, 3.8225653602290537, 3.8225695140852483, 3.8226010035671236, 3.822687223445948, 3.8227047168279418, 3.822874722631875, 3.822916572675343, 3.8229502304277303, 3.8230274051633475, 3.823171887637672, 3.823308230414692, 3.823322778040984, 3.8235473492072365, 3.8235473492072365, 3.8236923464396697, 3.8236953572061294, 3.8237478763262684, 3.823823982222066, 3.8240118119336994, 3.824443321112667, 3.8244471301510106, 3.8245668525850105, 3.824639707415847, 3.8247273242799467, 3.824929794776617, 3.8251564519982644, 3.8251564519982644, 3.8252372178077394, 3.825309293700989, 3.8253207205135364, 3.825477004801239, 3.82548879080319, 3.8255784597881886, 3.8255829347679833, 3.8255921871467486, 3.825669743828896, 3.8256994904078407, 3.8257701123745935, 3.825801233411278, 3.8258696812033337, 3.825938987328986, 3.8259678904631063, 3.82604013595692, 3.8260572065004164, 3.8261654825424007, 3.8261654825424007, 3.8263153826893403, 3.826602585117677, 3.8269090048831407, 3.8269183881159328, 3.827134396284846, 3.827406346144996, 3.82743279527027, 3.827502783517599, 3.827653050613612, 3.8278130194431337, 3.827855804608959, 3.827898198409268, 3.8280448104112765, 3.82807064469576, 3.8281815959057677, 3.8283244710861672, 3.828434535156114, 3.828498437022595, 3.828674826359322, 3.8287063697727395, 3.828777598950422, 3.828784814741759, 3.8287941194253916, 3.8288684416298886, 3.828937175655305, 3.829051726665014, 3.829051726665014, 3.829053560509567, 3.8290814885536086, 3.8293974564314834, 3.8295019218454214, 3.8295019218454214, 3.8295080159142767, 3.829880201125757, 3.8299066533218493, 3.8301106933512794, 3.8303056371483892, 3.8304564564213277, 3.830566403140299, 3.830582699797622, 3.830754087991964, 3.830786198537675, 3.8309364369286434, 3.83120952470518144, 3.83120952470518144, 3.831751771890707, 3.832240035332564, 3.832258564288332, 3.832269089157854, 3.832399255942911, 3.832399255942911, 3.8325483691411293, 3.832846307535253, 3.832870275112449, 3.833057097389035, 3.833410920416207, 3.8334340572100047, 3.833490779361874, 3.8335082646432075, 3.8337343224617486, 3.8338123342440196, 3.833970724628225, 3.8340045859012624, 3.834148569059805, 3.834148569059805, 3.834331645350684, 3.83434319436002, 3.8346128087160007, 3.

8347444537329385, 3.8347444537329385, 3.834791042598918, 3.8348043517458783, 3.8350113922364604, 3.8351131192547205, 3.83515626
6816322, 3.835156266816322, 3.835306678664089, 3.83538840774336, 3.8355906585934716, 3.8356131435639957, 3.8358326361881683, 3.
836049044521727, 3.8361425931244386, 3.8362183339412588, 3.8365258614940196, 3.8367087558480013, 3.8367500394655214, 3.83676215
20158046, 3.8367734697333145, 3.836852268780295, 3.836852268780295, 3.8368630050058496, 3.8369514058070107, 3.837124431597571,
 3.8372903566557217, 3.8373405946680212, 3.8375448282899733, 3.8376404234923873, 3.837918291638883, 3.8383075512725537, 3.83837
3570989248, 3.8384440012605983, 3.8384440012605983, 3.838454775968974, 3.8385214604010156, 3.838529807346425, 3.838743939261855
4, 3.838983995827645, 3.839089518674383, 3.839089518674383, 3.83928776117746, 3.8393220447236165, 3.840072208094328, 3.84039270
5368504, 3.840522178367752, 3.8407414219462535, 3.8408136150570504, 3.8408136150570504, 3.84081690823752, 3.8410459052361596,
 3.841141051621735, 3.841236649285561, 3.8412531058779353, 3.8413792041881014, 3.84160322417362, 3.8416275839724876, 3.84170243
56643927, 3.8417268780792755, 3.8418720130917685, 3.8418720130917685, 3.8419919428420544, 3.842091310351876, 3.842415236538186
7, 3.842460409085109, 3.842714767713153, 3.8428009351031234, 3.842843553412802, 3.8432858455728507, 3.8435647640054795, 3.84381
2974342177, 3.8441107492247997, 3.844245799118261, 3.8449098779895623, 3.8453480211285678, 3.845580007299655, 3.84564861891482
7, 3.845734588165658, 3.8460888509337554, 3.846226590493389, 3.8463679282479872, 3.8463924585255254, 3.8466558588125066, 3.8468
48461297421, 3.846932658155012, 3.8471540636451356, 3.8474537369677946, 3.8474537369677946, 3.847842216892389, 3.84790810953874
1, 3.8480332595331497, 3.8481480971757387, 3.849693807087224, 3.849693807087224, 3.850724581288699, 3.8523460463508767, 3.85360
53152575795, 3.853688047275369, 3.853730063129645, 3.853853714366871, 3.8539732712618306, 3.8540758798697605, 3.85427644931293
8, 3.854276449312938, 3.854322373085576, 3.85433403810977, 3.8545630903704327, 3.8550470186654806, 3.8554006765350493, 3.855400
6765350493, 3.855732651048238, 3.855732651048238, 3.85661686308945, 3.8569591798099943, 3.8583610707439173, 3.8584919190168128,
 3.859080227396551, 3.859794220594455, 3.8600214342801387, 3.8601914402007513, 3.8615049159114276, 3.86170992936374, 3.861748394
90006, 3.8623429680844703, 3.863224565198962, 3.863265454751616, 3.8633046315973965, 3.8639982218355993, 3.8639982218355993, 3.
86454872244546, 3.86454872244546, 3.8649174270673052, 3.8649174270673052, 3.8658616826599066, 3.8658695839542574, 3.865960266
5493127, 3.8661102163110375, 3.866273185658117, 3.8663190442313, 3.8666151661246544, 3.867609527199114, 3.8678601005920297, 3.8
68052435724789, 3.8681028639963686, 3.8684364083220695, 3.869052413480514, 3.869139356315785, 3.8695862702268164, 3.86994933149
88813, 3.87015252211132, 3.8703836548839585, 3.8704437861587566, 3.8704826891225794, 3.8705222231360157, 3.8705222231360157, 3.
870971298519291, 3.870971298519291, 3.8713796942085286, 3.8720292860046412, 3.8734180390602915, 3.874026401813045, 3.8740289780
569617, 3.87431785408455, 3.8745436861458398, 3.8750524159104316, 3.8750789603637523, 3.8754606026072724, 3.8757717467294537,
 3.875780946417599, 3.8758003714563984, 3.8758003714563984, 3.875966843128476, 3.876059906857808, 3.876144817479075, 3.87637219
6743896, 3.876372196743896, 3.8766380186995106, 3.8772913428786713, 3.8777782499931264, 3.878656889098134, 3.878981309790937,
 3.878981309790937, 3.8790702318542687, 3.8797532624317626, 3.88015253366226, 3.88015253366226, 3.880188326247005, 3.8808790010
174703, 3.881032944070356, 3.8810403099721893, 3.881282205843319, 3.8812944854360083, 3.881475797636134, 3.8820330252799526, 3.
8820330252799526, 3.8821951322985733, 3.882320089315335, 3.8828464013971447, 3.882907304854506, 3.883026200020417, 3.8832196932
523053, 3.8835361483235347, 3.8842501712131, 3.884561327476759, 3.8846381135825063, 3.8847358121670745, 3.885531707922791, 3.88
55531707922791, 3.8858450595854026, 3.8860527811783974, 3.8864601105114263, 3.8866565094426893, 3.8868907475752916, 3.8868916182
59962, 3.886891618259962, 3.887199957915491, 3.887199957915491, 3.8872273871435663, 3.8876767323463866, 3.8878228214478123, 3.8
87909888479264, 3.888134186900546, 3.88863344621695, 3.8888010721139143, 3.888862747811053, 3.8895869054158725, 3.8896753410408
595, 3.8900661545302215, 3.89039415389036, 3.890400875441571, 3.8906132642875373, 3.8906132642875373, 3.8908726481027722, 3.890
87722253027752, 3.8914125048259605, 3.891512614252037, 3.892096591357063, 3.892221883382649, 3.8924022311890396, 3.8924807207364
798, 3.8924807207364798, 3.8925343475782426, 3.8925918555956667, 3.8936261953549667, 3.8937474930343208, 3.894073227030678, 3.8
94792103064723, 3.894792103064723, 3.89437872936118, 3.894514880125146, 3.8947693488970474, 3.894819293758978, 3.895111337372
9296, 3.895252456701528, 3.8953538022741525, 3.8954241738154334, 3.895453013795956, 3.896534432965203, 3.8965431410632836, 3.89
65431410632836, 3.896960908461644, 3.897085609622183, 3.897429901141673, 3.8975245695806136, 3.8976673436967304, 3.897951496882
7798, 3.897993271166334, 3.898026418974553, 3.898039267951751, 3.898099829054515, 3.898407642155813, 3.898904303452517, 3.89892
572078814, 3.899166121093161, 3.899362313572336, 3.9001178587300185, 3.900150718967523, 3.9005429091692996, 3.900560881136917,
 3.900858029954097, 3.9011081471142814, 3.9013306719438994, 3.9017639090547656, 3.901868473460224, 3.9021304250831403, 3.902229
1708879533, 3.9023940592017827, 3.9026707649989865, 3.903263654168747, 3.9033658143179477, 3.9033658143179477, 3.90340017014827
54, 3.9036116859149663, 3.9038557928161084, 3.9039363339199475, 3.9039441230582086, 3.9043579140470457, 3.904665922439514, 3.90

48885596036094, 3.905001298429883, 3.9055287266834617, 3.905647444003679, 3.9057422576266836, 3.9057997632224635, 3.90582738937 0747, 3.905827389370747, 3.9058467062960016, 3.9058600356924424, 3.9062136980569098, 3.9062136980569098, 3.9062383490514643, 3. 9063330258693116, 3.9063330258693116, 3.9064233945301696, 3.906624225278927, 3.9070808292571693, 3.907431348402879, 3.907482799 6366417, 3.907660966779934, 3.9076646783047986, 3.907799510322639, 3.907865275171414, 3.9079749593820843, 3.908114931559583, 3. 908234082644255, 3.908801178502759, 3.9090443041784466, 3.9090815846225144, 3.909458763622251, 3.9094634183096573, 3.9097737699 2677, 3.909778410196591, 3.910032013823861, 3.910083581353057, 3.910083581353057, 3.9105765446926206, 3.910620640077026, 3.9106 675093715793, 3.9107179462952564, 3.910722041568075, 3.9108296018105606, 3.910839545595462, 3.910868830847536, 3.91110559810019 08, 3.911141093683797, 3.9111842362479727, 3.9113206918220684, 3.9114327886933937, 3.9115048875308323, 3.9115302731144483, 3.91 16086350722785, 3.9117279253041337, 3.9121136154937646, 3.912301173530821, 3.91276253286963, 3.9128854624939957, 3.912974907510 9106, 3.9130810775759923, 3.913102814968135, 3.913365105357954, 3.913631011460363, 3.913848813693133, 3.9138550089774737, 3.913 872553960236, 3.913872553960236, 3.913875209204582, 3.9140277784596607, 3.9140513538560215, 3.9143526574648315, 3.9144485999519 762, 3.9144741055000174, 3.9148280887202627, 3.915246767722734, 3.9153755261976717, 3.915403076989583, 3.9155813023642767, 3.91 5681603317674, 3.9161981728770536, 3.9164195661811534, 3.9164632770486505, 3.916814032561686, 3.917383582923379, 3.917536736683 822, 3.917536736683822, 3.9177818101681137, 3.917828820539459, 3.9180304802763395, 3.918102032494342, 3.9183010247888572, 3.918 3407251688456, 3.9184717884935023, 3.91864971484855, 3.91896132297962, 3.9190100615016368, 3.9190100615016368, 3.91913956205685 5, 3.919139562056855, 3.9191487216403207, 3.9192861558783676, 3.9193511911868764, 3.919465792866265, 3.91964246383022, 3.919654 9264336134, 3.919709155787028, 3.9197296316819306, 3.919862935650699, 3.9198977032282603, 3.920143461056685, 3.920336463914603, 3.9204305798065233, 3.920433004345091, 3.920433004345091, 3.9209826142431727, 3.9211145023287375, 3.9211407730561496, 3.9215261 9882329, 3.921526198882329, 3.9216866110088793, 3.9216885238376635, 3.9217847846093083, 3.9219243636199406, 3.922429773113690 6, 3.9225876886625928, 3.9225876886625928, 3.922651333669968, 3.9230622076459913, 3.9232181627484226, 3.9232181627484226, 3.923 3306744462975, 3.9233701937533483, 3.9234156620082703, 3.923463496054153, 3.9239026884101396, 3.9242611715257216, 3.92442135030 98173, 3.924651495606405, 3.9246571641997736, 3.925004889877682, 3.9250741762151167, 3.925098379281779, 3.9255519396337513, 3.9 25767365465486, 3.9255767365465486, 3.9257568667647242, 3.925855050223078, 3.9259019373329416, 3.926040257671856, 3.9260700703 118863, 3.9261106791046188, 3.926410345901812, 3.926941026635827, 3.9270506308648114, 3.9273029947535605, 3.9274059603137252, 3.9275190291209054, 3.9275434600042125, 3.927743687425705, 3.9277776929590806, 3.927778201422244, 3.92784845815199, 3.92814159 92345443, 3.9281563961497525, 3.9282846962224487, 3.928572074392312, 3.928572074392312, 3.928709133392556, 3.928805450201857, 3.928993092052812, 3.929034416147446, 3.9290911345697395, 3.9291155946045513, 3.929196354745878, 3.9292632298156325, 3.9292941 96840802, 3.929336187132824, 3.9293652606185163, 3.929401925901249, 3.929528751837821, 3.9296149587727993, 3.9304438643067625, 3.9307277667630562, 3.9307484517715037, 3.930755649267857, 3.930851308062017, 3.930851308062017, 3.930941227483102, 3.93094122 7483102, 3.9311500738708487, 3.9311602509177694, 3.931212809351142, 3.931399695633265, 3.9315427587406617, 3.931639889120154, 3.9318549128493165, 3.9323849139552776, 3.93238575184494, 3.932526492815399, 3.9325609079984196, 3.9328528807480896, 3.9329408 50814338, 3.9329846051999007, 3.9331248930075966, 3.933126327201136, 3.9331692985715723, 3.9332760457111484, 3.933679944119844 2, 3.933683568846933, 3.9337234938597168, 3.933743288986215, 3.9337594315722777, 3.933820772890616, 3.9339216460810276, 3.93438 17140898736, 3.934557233448236, 3.9345718044415228, 3.934592935526463, 3.93468673960027, 3.9348014488607683, 3.935162154132363, 3.9355001394563773, 3.935527901628731, 3.935573812685725, 3.93561941460862, 3.935921355046934, 3.9359842568412153, 3.9360880551 307975, 3.936103054616803, 3.93618894767575, 3.9364110799395133, 3.9364110799395133, 3.936562170564601, 3.936562170564601, 3.93 6883578227044, 3.936884283832882, 3.936884283832882, 3.936915745456388, 3.936915745456388, 3.9369864515950903, 3.93732437859718 7, 3.93732681939932995, 3.93757599839211324, 3.937664162610696, 3.9379784429544245, 3.9387367868008285, 3.938741231182205, 3.9388 275554866214, 3.938884230567101, 3.938904468379469, 3.9390058259067096, 3.9391422543001697, 3.939333020790481, 3.93935494925026 5, 3.9395197532419575, 3.939592374986631, 3.9396242943675945, 3.9398657961080605, 3.9400690171883945, 3.940366139854948, 3.9404 336841477563, 3.9406660264792346, 3.9409366893393574, 3.9409703039947335, 3.941120360967642, 3.9412466768785466, 3.941467860583 848, 3.9415446725007021, 3.9415864959322615, 3.9417007261004997, 3.9418334471373555, 3.941941119111681, 3.9419849436116263, 3.94 20304970209945, 3.942377714579999, 3.9425017399314033, 3.9425313203752976, 3.942870355737999, 3.9429425024618516, 3.94317101047 1575, 3.943313044505155, 3.943336850338307, 3.9433998316108565, 3.9434171255309285, 3.943427083455999, 3.943427083455999, 3.943 431737884301, 3.9435626044289687, 3.9435814501392725, 3.9437191761917343, 3.9438630701601354, 3.9439261041517106, 3.94397828429 34368, 3.944392697014257, 3.9444799794576766, 3.944661422705724, 3.9448983152328396, 3.9451052421476387, 3.9451871670044407, 3.

9453044805991215, 3.9455410919224, 3.9457831704437787, 3.945876853390078, 3.945953524988746, 3.945977303114788, 3.9459971884107916, 3.946196665319727, 3.9464927631507205, 3.9465510045211407, 3.946640010260166, 3.9466650117005915, 3.9466809562701886, 3.9467173618130227, 3.9467173618130227, 3.9467598940329074, 3.9470952296429402, 3.947131115134429, 3.9472523340676773, 3.947283347271722, 3.9473858095417906, 3.9474514883900245, 3.9475469720822813, 3.947576109598743, 3.947580638554556, 3.9476212415841316, 3.9476463750216753, 3.9476547922449647, 3.947750746523615, 3.947871928003136, 3.9479483406986047, 3.94813427784439, 3.948235154391905, 3.9483250455126035, 3.948413420911887, 3.948479916919958, 3.948568629469042, 3.948568629469042, 3.9487296838171915, 3.94874120921188888, 3.9488437112364747, 3.948851656619963, 3.9489196359058587, 3.9489876490942133, 3.949028065112218, 3.949041114555837, 3.949312003605943, 3.9494339627736976, 3.949582421321425, 3.949639024550037, 3.949656371222692, 3.949721108408541, 3.9497691374626327, 3.949801631424235, 3.9498406178146688, 3.9498450025885163, 3.94991275450588, 3.949963425633919, 3.9499824032124335, 3.950024588559999, 3.950024768929946, 3.9500700051410567, 3.950121443796219, 3.950121443796219, 3.9501633658275885, 3.95025985995194, 3.950349781085992, 3.9503860272730167, 3.950558205045451, 3.9505801178219704, 3.9508507510749564, 3.9509216110073755, 3.951014595980596, 3.951014595980596, 3.951076417684782, 3.9510781535772965, 3.951404770744426, 3.951404770744426, 3.951408356247644, 3.951477667874053, 3.9515700005982284, 3.9517139519009463, 3.9520234464087807, 3.9521244603090793, 3.9521247036782037, 3.9521247036782037, 3.952181619875826, 3.9524464990371033, 3.9524668162082492, 3.9526208867804793, 3.9526208867804793, 3.9528255598391229, 3.9528787549517808, 3.953084635679544, 3.9532723769645814, 3.9533451884835573, 3.9534475118492884, 3.9534475118492884, 3.95349960437348, 3.953594373034488, 3.9535983601997957, 3.953867945505081, 3.953906681357091, 3.953906681357091, 3.9541258368153232, 3.9543196096878885, 3.95453363648721, 3.954574149660548, 3.9546189436483625, 3.9547130158927946, 3.954785905600392, 3.955012123673556, 3.955012123673556, 3.9551761792597655, 3.9553459335454697, 3.9554597812939094, 3.9555875767335644, 3.9556697111443024, 3.955790471904371, 3.955933506329362, 3.9560042677675242, 3.95623332777546, 3.9562685360078715, 3.956487408048104, 3.9566211328068257, 3.956975633115238, 3.9570487892204094, 3.957097367911423, 3.957156795904, 3.957186597636111, 3.957227329339905, 3.957267492976681, 3.957411734569513, 3.957429222997405, 3.9574466735340375, 3.9574602676959065, 3.957466128851337, 3.9576475673971605, 3.9576475673971605, 3.9576649529820456, 3.9576915390867504, 3.9577859807905984, 3.958228665330606, 3.9583148418379763, 3.958376329159553, 3.9585126019388035, 3.958546881366186, 3.9586866060369372, 3.9587270132645394, 3.958762362992587, 3.9587669319370122, 3.9590516375607674, 3.959072650358363, 3.9590735257588614, 3.959151848921854, 3.959309288566282, 3.9593092885666282, 3.9594063682413583, 3.9594688741100574, 3.9595740546752185, 3.959649904948108, 3.959707898950738, 3.959707898950738, 3.9597732191125994, 3.9599022608153986, 3.9599022608153986, 3.960131739039084, 3.960209935622781, 3.9603096611798585, 3.9603296813039406, 3.9603376096854226, 3.9606470060416994, 3.960737276901799, 3.9609077706657088, 3.9609381302665745, 3.9609381302665745, 3.9611024238016532, 3.9611429081311793, 3.961215807298305, 3.9615390816622176, 3.9617200623334323, 3.9617200623334323, 3.961756745135457, 3.9620772485441185, 3.962179827299974, 3.9622254867426823, 3.9624074413082333, 3.9624798613643524, 3.962529460392643, 3.9625538267331026, 3.962632775481979, 3.9629034005304695, 3.9632654084726124, 3.9632654084726124, 3.963301262738799, 3.963324482885466, 3.9634538166842614, 3.9638480398728824, 3.9638710982767673, 3.963938965987787, 3.96454979192866, 3.964559753857393, 3.9645899763501125, 3.9648242955226887, 3.9648302326280063, 3.9648666594486373, 3.964922405515789, 3.9650909685008098, 3.96509948224769906, 3.9651108697988835, 3.9652921544625768, 3.9657522842571553, 3.965897565484322, 3.965920982176611, 3.9659608464790246, 3.9661681881562405, 3.966201690635597, 3.9663005170111103, 3.966457282737867, 3.96652068297732, 3.9668456813834276, 3.9668535503080098, 3.9668950682295803, 3.967164633707623, 3.967194780952756, 3.9671999522484307, 3.9672672552017176, 3.967508146927435, 3.967604314232322, 3.9678252207404965, 3.9679158003167796, 3.968022105608461, 3.9681362334312444, 3.9683430756978018, 3.96839515801914, 3.9688377173639697, 3.9694978505804954, 3.9697170869723712, 3.9698008629092936, 3.9698008629092936, 3.97002763086627083, 3.9701571926408628, 3.9706441569222797, 3.9713000458260015, 3.971365198916402, 3.9713744732469007, 3.971554992958423, 3.972137037013321, 3.9722276014659754, 3.972318039945237, 3.972318039945237, 3.9723877426051257, 3.9724049253161, 3.972422594264671, 3.972430313811002, 3.972545230542523, 3.9728115545087, 3.9728115545087, 3.973212031538351, 3.9735308638737172, 3.9736270193962344, 3.9736679670784794, 3.973709264031114, 3.97403203766877, 3.9744495482281144, 3.974504545933074, 3.975131974150497, 3.975456711971271, 3.976174263133838, 3.976652363768249, 3.977874243395982, 3.977874243395982, 3.9781547197930807, 3.9795813203955281, 3.981171420371457, 3.981341992243345, 3.981485095556288, 3.9816893412884786, 3.9819331788412304, 3.9821260125740703, 3.98221284061535433, 3.9824742836064897, 3.9834606227112803, 3.983575054876234, 3.983575054876234, 3.9835863465493113, 3.9836858376586197, 3.983710150478534, 3.983710150478534, 3.9841052489271735, 3.984174954869671, 3.9858546653384925, 3.9861864852929907, 3.9861864852929907, 3.9864374219363787, 3.9868495590242765, 3.986983479746836, 3.9873366151429614, 3.9876807921597512, 3.9876928337

310904, 3.9878358590811245, 3.9883646565791486, 3.9883646565791486, 3.988626436507161, 3.9894877820549786, 3.989876367540452, 3.9900316556832762, 3.9906409691913076, 3.990656719452704, 3.9908322872967914, 3.9915513005433083, 3.9919311937142656, 3.99215 98911722445, 3.992558954042374, 3.9927341296512373, 3.9927452693119037, 3.9931259317344665, 3.99397406691967, 3.99400753891119 3, 3.994093942118065, 3.994093942118065, 3.9945860372267386, 3.994875265577382, 3.994875265577382, 3.9951392166048327, 3.995416 0215512364, 3.9954160215512364, 3.996004742111718, 3.996004742111718, 3.9972861082643134, 3.998030042027151, 3.998535479077428, 3.998935808370467, 4.000915376887927, 4.0009436344994525, 4.0011601452095595, 4.0011601452095595, 4.002884598420647, 4.00297405 1562876, 4.003418872713941, 4.00392579526118, 4.003928564871614, 4.004006318382132, 4.004366892214036, 4.0046059083050105, 4.00 46059083050105, 4.006077924520463, 4.006208934811644, 4.006419482081224, 4.00655982733582, 4.006656540360642, 4.00676169670192 6, 4.006920212105362, 4.006952538766268, 4.007832626983942, 4.0078346394517785, 4.0078940853838665, 4.008518449016377, 4.008518 449016377, 4.0085551551551077, 4.0089866617820125, 4.0089866617820125, 4.009909099480243, 4.009909099480243, 4.010137581495455, 4.010216894982366, 4.010395229782117, 4.010975818300802, 4.011032635474508, 4.0112510675007025, 4.011440968538736, 4.011457181 167396, 4.011607393763161, 4.011624908561997, 4.011670144566688, 4.011683771767019, 4.011767955459246, 4.011892685927091, 4.011 9289217367555, 4.012027030409293, 4.012931768323713, 4.013164966693662, 4.013564171131861, 4.013576410831741, 4.01357641083174 1, 4.01444494371041, 4.014915243606326, 4.014976625747449, 4.0149775043272165, 4.0149775043272165, 4.0155984767973125, 4.015623 865604656, 4.015623865604656, 4.0156937062899924, 4.016252961167284, 4.016252961167284, 4.016480526001315, 4.016604223717305, 4.01673532981072, 4.017359570527408, 4.017378046008349, 4.017430988133542, 4.017545285219227, 4.017564452550054, 4.01756445255 0054, 4.017814929960044, 4.017923829873804, 4.018001978160366, 4.018099916906294, 4.018099916906294, 4.018143021643481, 4.01865 3986542578, 4.019657531963842, 4.01974907418753, 4.020163649345871, 4.020274736731668, 4.02052470193435, 4.020930356289582, 4.0 21137333041827, 4.02118224549019, 4.021241569275973, 4.021350089403034, 4.021452959150551, 4.0223762816118995, 4.02242976667444 7, 4.022646991493967, 4.0227975646840815, 4.023064731766362, 4.023218107764418, 4.023585898484199, 4.023670918475096, 4.0239124 0006611, 4.024088841849349, 4.02420104752441, 4.024602915481405, 4.024701683772684, 4.024701683772684, 4.024714685703124, 4.025 069831963462, 4.025383102123535, 4.026463345038231, 4.026596219995079, 4.027442498094713, 4.027442498094713, 4.028244857149681, 4.028461055156587, 4.028752268285988, 4.028880359425915, 4.029132219663951, 4.029690410461877, 4.029831543847651, 4.03006797407 6115, 4.030178678257065, 4.03063028124005, 4.0311903379551435, 4.031421468475259, 4.03151184418751, 4.032286607188914, 4.032364 415079755, 4.032434005375143, 4.032611907441372, 4.033186312801182, 4.033191624926323, 4.033230975881831, 4.033275013308784, 4. 033469910871244, 4.0336465375917605, 4.0336465375917605, 4.034390998984546, 4.0349390185649, 4.035110888046201, 4.0351915987879 625, 4.03536224500912, 4.0355797641408575, 4.035685141869634, 4.03577204926518, 4.035782605511317, 4.035799283140436, 4.0361007 490669065, 4.036345553807788, 4.036345553807788, 4.036471157100046, 4.036484628108411, 4.036735783866377, 4.037173876077193, 4. 037313710151874, 4.037435258434207, 4.037531332547545, 4.037587783626339, 4.037587783626339, 4.03764491647547, 4.03766275240329 7, 4.037895130419212, 4.038092233345991, 4.038218172063113, 4.03831688365996, 4.038502175897225, 4.038502175897225, 4.038504303 14794, 4.038926218987312, 4.038961606333881, 4.039096357336184, 4.039205088438788, 4.039514210926375, 4.039620461403834, 4.0397 016264026355, 4.040059906325571, 4.040059906325571, 4.040444227982593, 4.040706160103507, 4.04097054738984, 4.04116119790626, 4.041250340949083, 4.041367189453649, 4.041526741394256, 4.041662938167922, 4.042051446412355, 4.04224931733755, 4.04283655965 0515, 4.042903586233328, 4.0429176230720545, 4.042978353720478, 4.043174095576056, 4.04352442922003, 4.043546630246369, 4.04358 7206024391, 4.04368240861696, 4.043890699147841, 4.043913837549298, 4.044146323727947, 4.044231998227226, 4.044460487268486, 4. 044743839793766, 4.044743839793766, 4.044753706935765, 4.044998676401799, 4.045342609153089, 4.045475187320432, 4.0456467894950 49, 4.045651238162201, 4.0459052578064565, 4.046116066085419, 4.046143054799546, 4.046586287207725, 4.0466226501165075, 4.04674 2285410391, 4.046756048324855, 4.046756048324855, 4.046757415314776, 4.046855179747396, 4.047179969620075, 4.047233109935945, 4.047259028251282, 4.047336523297845, 4.047336523297845, 4.047692751034125, 4.048232098144202, 4.048256609550067, 4.0482986853 22352, 4.04832408266551, 4.048409725837173, 4.048898906298225, 4.049026361937495, 4.049088235669039, 4.0491834847251775, 4.0491 834847251775, 4.049188113894211, 4.049827010463204, 4.049856815167488, 4.049954846425153, 4.0502085891222, 4.0502178332232175, 4.050293054674782, 4.050537610459725, 4.05080447473771, 4.050809057163244, 4.050960440293624, 4.051135043585714, 4.05122733023 4272, 4.0513451384700625, 4.051381180441955, 4.0514419335728675, 4.051744470530384, 4.0521283273601245, 4.0521283273601245, 4.0 52261520879374, 4.052420484468933, 4.052420484468933, 4.05243658649037, 4.052526713820922, 4.052922781732685, 4.05292278173268 5, 4.053015408804774, 4.05302005176458, 4.053168595126249, 4.053447564370346, 4.053466430207773, 4.053580325402546, 4.053930479 802072, 4.054059958275549, 4.0542806564293254, 4.054285711965843, 4.054576355291878, 4.054645470274151, 4.054872021360737, 4.05

5173589936925, 4.055308859849177, 4.055361338227267, 4.055550275549754, 4.055689088353203, 4.055689088353203, 4.05572484699468
3, 4.055853248006344, 4.055899150294359, 4.055899150294359, 4.056294649539367, 4.0564701070125535, 4.05656937492464, 4.05666359
564235, 4.056744843595224, 4.056960355390067, 4.05697119848562, 4.056985544821165, 4.0572267052853075, 4.0572267052853075, 4.05
7438077125094, 4.0574574042243015, 4.057550531594174, 4.05756640411644, 4.057637144719654, 4.057637144719654, 4.05799565577352
9, 4.058497563649218, 4.058546734506027, 4.058576055460277, 4.058770693311211, 4.058940427381328, 4.059210401292492, 4.05924214
7768877, 4.059350733627744, 4.059676740907825, 4.060554520816498, 4.0608028294842535, 4.061028827576303, 4.061127609724146, 4.0
61222206371882, 4.061266270967195, 4.061315101343063, 4.06133778531735, 4.061407694452688, 4.061731231109369, 4.06195733146969
1, 4.062089646321876, 4.06215082413134, 4.062498630945989, 4.06269737911772, 4.062717722379437, 4.062824677689346, 4.0630376381
99371, 4.063206025314755, 4.0632454714060735, 4.063293561332322, 4.063318351059508, 4.063465394334797, 4.063465394334797, 4.063
48801973314, 4.0636006996245895, 4.063788250473706, 4.064575496957252, 4.064807568220986, 4.064825333412421, 4.065004183444066,
4.065021416406893, 4.065021416406893, 4.065078312812721, 4.065181400354467, 4.065181400354467, 4.065229906727448, 4.06534288556
93905, 4.065503919825529, 4.065503919825529, 4.065604908774451, 4.065658149196819, 4.065774565553123, 4.065794465447482, 4.0659
21879865095, 4.066373127885403, 4.0663824656764005, 4.066510768442184, 4.066545877792906, 4.067142853032138, 4.067205550049706,
4.067459113183802, 4.067565264517248, 4.068447679970802, 4.068447679970802, 4.068510030863181, 4.068607503339483, 4.06909166534
1929, 4.0692698010155, 4.06951692271116, 4.069558630260275, 4.069720172948919, 4.0697611372586495, 4.069771327983246, 4.0701415
07726155, 4.070696738424429, 4.0707685414515, 4.070911742550388, 4.071061320520019, 4.071098750557762, 4.071140075917317, 4.071
4170528126745, 4.071545055659479, 4.071647858029009, 4.071850717252106, 4.071963403297668, 4.072188355197809, 4.07225109117428
2, 4.072251091174282, 4.072337971112276, 4.072479551232993, 4.072633060282566, 4.072642034412592, 4.07281622945913, 4.072829172
873962, 4.072888152390298, 4.073262790592961, 4.073520775062313, 4.073734229913256, 4.073738846821852, 4.073902288523797, 4.073
909642629751, 4.074045725445017, 4.074130351400179, 4.074290011120677, 4.074338404396397, 4.074338404396397, 4.074347387695498,
4.07440634721308, 4.074500221895553, 4.074500221895553, 4.074565805519272, 4.07458173394825, 4.07459749515426, 4.07466606058829
05, 4.074683127495281, 4.074818204522456, 4.075208410167866, 4.0753375902297995, 4.075768638463013, 4.075768638463013, 4.075894
440357928, 4.075953311845848, 4.076091329775389, 4.076238047896448, 4.076366208776192, 4.076400050324534, 4.076438098288489, 4.
076519813213536, 4.076527017981965, 4.076560642296634, 4.076648906852957, 4.0767943173601005, 4.076806623439411, 4.076882174592
971, 4.076882174592971, 4.0769918480298815, 4.0770119177509, 4.077262562953594, 4.077342828740177, 4.077403858463079, 4.0774167
76125081, 4.077598531997522, 4.077764588054317, 4.077967414896795, 4.077996298626881, 4.078546653049951, 4.07883217335478, 4.07
883217335478, 4.078965055924636, 4.079058708225814, 4.0791903141475165, 4.079288235187268, 4.079288235187268, 4.07940826756640
6, 4.079408267566406, 4.079493873414208, 4.079552189451135, 4.079672815873223, 4.079749348640153, 4.079749348640153, 4.07976391
1763155, 4.0797785212429245, 4.0797785212429245, 4.0800802326794505, 4.080145013811493, 4.080301090460028, 4.080669444190367,
4.080671688748725, 4.0810228850730725, 4.081203241331215, 4.081220988768826, 4.081719900152964, 4.081737037128498, 4.081920498
2957435, 4.082015348023225, 4.082068264113499, 4.082101583204892, 4.082369826372249, 4.082442788943195, 4.082549031286096, 4.08
2598991351584, 4.082730298594046, 4.082737724117304, 4.082750852196931, 4.0827860546398345, 4.082811505499084, 4.08299529902327
5, 4.083134849753266, 4.083344275466058, 4.08342137119788, 4.083537405735895, 4.083541938347042, 4.08355307850316, 4.0837890893
06021, 4.083927418516059, 4.084057947351924, 4.084311504383536, 4.084422935683217, 4.084511450721612, 4.0846108871415145, 4.084
853724076421, 4.085194421761748, 4.085218397057388, 4.085281008699564, 4.085490375781489, 4.085596899395361, 4.085776241478841,
4.086125663606209, 4.086182364762066, 4.08623681902727, 4.08623681902727, 4.0862567284054006, 4.086405943850063, 4.086766149129
236, 4.086798707003879, 4.086829791238922, 4.086830140385303, 4.086923752975891, 4.087203438771095, 4.087712477513792, 4.087719
676021211, 4.087743044522041, 4.087751294262332, 4.08805049984115, 4.088178578481363, 4.088689314847873, 4.089067477125517, 4.0
89229594787313, 4.08954419694676, 4.089730451052725, 4.089730451052725, 4.089737678326743, 4.089827221064423, 4.08983637597721
2, 4.0899490129826495, 4.09001750621746, 4.090083364218918, 4.090145501397584, 4.090419892773028, 4.090475131538547, 4.09086692
5384958, 4.091175039303189, 4.091175039303189, 4.091211134698478, 4.091377915596751, 4.091637800999915, 4.09176666949865, 4.091
774235951771, 4.092218445026903, 4.092430428340905, 4.092562097243546, 4.092704075330712, 4.092804267421596, 4.093260195720178,
4.093417998893051, 4.093721247073445, 4.093865357174128, 4.093913176432034, 4.093931619746433, 4.093988032848672, 4.09517786320
666, 4.095293533334195, 4.095428989532648, 4.095457571484948, 4.095772974853518, 4.096406463619938, 4.09680330898759, 4.0972320
93894275, 4.097516121601289, 4.098176072938068, 4.098842639421042, 4.098943222626972, 4.098956168730392, 4.09962010425396, 4.0
99698429386787, 4.099947278570874, 4.099947278570874, 4.100086402746821, 4.10026584295549, 4.100480122825091, 4.10069349107864

6, 4.100770855271807, 4.101065880944774, 4.1019472282663845, 4.1019472282663845, 4.10246576063028, 4.102851519024712, 4.103248033008414, 4.1032594418536394, 4.1035475594705, 4.10383939491013, 4.103931398684812, 4.103931398684812, 4.1048329310375, 4.1062859393862, 4.1064806058069045, 4.10731336976619, 4.107367567679836, 4.108804245598609, 4.108973980449947, 4.10931691146652, 4.109407180396038, 4.109432165409471, 4.110403369290085, 4.111705210387777, 4.112235079421981, 4.112235079421981, 4.112243535058776, 4.113547031054333, 4.113788231674649, 4.113788231674649, 4.11480917819416, 4.11590031635166, 4.116168141094585, 4.116267913669585, 4.117186545473064, 4.1181826142178375, 4.1187340226465325, 4.118744530890714, 4.119267931655242, 4.119341607161206, 4.119529352845081, 4.120449997639944, 4.120669883168026, 4.120922784724904, 4.121110750042099, 4.1218193028072365, 4.1218193028072365, 4.1221088362791125, 4.1228293779820175, 4.123086832563061, 4.123569892929166, 4.123603026394158, 4.124068353946657, 4.1244484445526757, 4.12531513561222, 4.125617252300354, 4.126031145125006, 4.126201608996948, 4.12635851240756 2, 4.126530568006388, 4.126571034523257, 4.126720505301168, 4.126759658320045, 4.126830678509375, 4.126940565132544, 4.127364402211849, 4.127399436431133, 4.127595653392705, 4.128211962423002, 4.128523551538351, 4.12863682788580 4, 4.128738752066772, 4.129462747643237, 4.129491876157686, 4.130023599161729, 4.1300921147353815, 4.131001937830831, 4.131020102303087, 4.131060797753154, 4.131231245872281, 4.131430869375975, 4.13259079639489, 4.132689065759858, 4.1327515780282456, 4.133283969931778, 4.133376002778063, 4.134575370407479, 4.13509318815431, 4.135128231406008, 4.135770301958275, 4.135810672155479, 4.135810672155479, 4.136253013248226, 4.13691401579848, 4.137085495568546, 4.137747043254666, 4.13795779890645, 4.138112605550083, 4.138944254841571, 4.139617786344384, 4.139881561684059, 4.14000485670535, 4.140159989112736, 4.140565565961457, 4.140796843174956, 4.141272900151252, 4.141726616598704, 4.141842163650316, 4.142180299726586, 4.142302110250539, 4.142337885382624, 4.142481356157272, 4.142515099595118, 4.142573797541896, 4.143022631293468, 4.1432893980996 4, 4.143421961031482, 4.143492410605203, 4.143539171080975, 4.143539171080975, 4.143589492948804, 4.143746904620343, 4.1437800701865655, 4.143797180183728, 4.144079341313231, 4.144150170898695, 4.144173760902597, 4.144274390781994, 4.144350799943123, 4.144350799943123, 4.144390921081551, 4.144398360435476, 4.14456856024654, 4.145031350932297, 4.145920268814404, 4.146209201278236, 4.146227438698266, 4.146355189513174, 4.146355189513174, 4.14650188579962, 4.14650188579962, 4.14653693938306, 4.146542237694835, 4.146618976106315, 4.146618976106315, 4.146866018564985, 4.146866018564985, 4.146906444371508, 4.147403623422295, 4.14751020971274, 4.14751020971274, 4.1476301318564115, 4.1476301318564115, 4.147918201763633, 4.148565676661335, 4.148766531782841, 4.149159143087357, 4.149172898438842, 4.149304776295282, 4.149337856430786, 4.149629289407024, 4.150129764846476, 4.150142783354344, 4.150325885698786, 4.1503853347593305, 4.150540227231042, 4.150540227231042, 4.150858230387777, 4.150919541789421, 4.151268486341447, 4.1519450431520655, 4.1519450431520655, 4.152519836931192, 4.152577445026707, 4.152662645077448, 4.153060917727492, 4.153228368789913, 4.153228368789913, 4.153313304745793, 4.153392687977653, 4.153685895775611, 4.153693554310655, 4.1537795891642295, 4.153957187968589, 4.154045487293756, 4.15411382467013, 4.154124266548774, 4.154124266548774, 4.15432325178773, 4.154679900768287, 4.154799205985834, 4.155300924759425, 4.15591279897924, 4.156011161508843, 4.156614429033864, 4.156819851802318, 4.156932017266313, 4.157557175210063, 4.157888251522031, 4.157934260065556, 4.158309057023957, 4.158830732622819, 4.15908803546561, 4.159222499223266, 4.159361400278909, 4.1593650485493265, 4.1593650485493265, 4.159701577986933, 4.159704389183378, 4.159889201338692, 4.160057295758207, 4.16016323842132, 4.16016323842132, 4.160328386958059, 4.160553638912835, 4.160754967913885, 4.161062459614748, 4.161135543942774, 4.161278717125315, 4.161775899538061, 4.161908853200884, 4.161947984253116, 4.161969620024726, 4.162323546348438, 4.162323546348438, 4.162640411197245, 4.162668196686086, 4.162668196686086, 4.162903843595588, 4.163061155216446, 4.163855003257774, 4.1639064797292775, 4.163927896830782, 4.163955055774, 4.163964725952241, 4.16413492275173, 4.164433173908927, 4.164631569815827, 4.164925569157465, 4.165109986822805, 4.16539624302, 4.165412856782727, 4.165427936420799, 4.165613239441074, 4.165613239441074, 4.165697481259493, 4.166153369612805, 4.166331637160974, 4.166383234375368, 4.166404377136486, 4.16659419188173, 4.166885971863971, 4.1668996017283355, 4.166956808525029, 4.167098196547166, 4.1676503520687085, 4.167746419078976, 4.168102322917906, 4.168113837224738, 4.16811889446686, 4.16811889446686, 4.168158376158323, 4.168224175575715, 4.168224175575715, 4.1685607870533286, 4.168684661849042, 4.1687557736656, 4.168819299456823, 4.168872181484056, 4.168965947976003, 4.16912143882346, 4.169221821002687, 4.169226737662767, 4.170081779265859, 4.170279824467416, 4.170772790436873, 4.171082706837, 4.171642298923745, 4.171676689051734, 4.171815066916957, 4.172212210981593, 4.172284707507675, 4.172365302310457, 4.172429891956474, 4.1725655192772075, 4.172727322646687, 4.172917756993789, 4.1729214736769205, 4.1730660327732645, 4.17316966752795, 4.17316966752795, 4.173330586796335, 4.173584303480269, 4.173628848155115, 4.173886194125803, 4.17391401176693, 4.174050997881484, 4.174050997881484, 4.174308228184 0085, 4.174697531300575, 4.174923309449954, 4.174985952241725, 4.175346416828999, 4.175423156623177, 4.175459290379483, 4.175487198420614, 4.175811186620785, 4.17606478927864, 4.

176142831793838, 4.1763011925776, 4.176332744889778, 4.176379472427827, 4.176405831529958, 4.1764373971487725, 4.17652584015162
9, 4.176535821187041, 4.176665420713072, 4.176783175334499, 4.177039432354269, 4.177039432354269, 4.177351691921455, 4.17766708
2218529, 4.178016747599178, 4.1780812636865905, 4.178212479033293, 4.178334528040235, 4.178423553668122, 4.178508474148196, 4.1
78576558617157, 4.178876891472072, 4.1792534451710015, 4.1794210834490055, 4.179519133120567, 4.179655013247341, 4.179935496555
564, 4.180071455002299, 4.180427842018813, 4.180427842018813, 4.181655797950996, 4.182301469028155, 4.182329813915018, 4.182360
289040024, 4.182388244356358, 4.182446208673911, 4.1824483539299555, 4.1831424821751115, 4.18333048177314, 4.1834145080521905,
4.1837467938071855, 4.183866429751397, 4.183893002106467, 4.184219686164658, 4.184302644462659, 4.184365349062036, 4.184497120
242293, 4.184875271716587, 4.184921705085247, 4.184922249848562, 4.184986350180551, 4.185075363058739, 4.185201166553903, 4.185
4148944976055, 4.185929120293673, 4.185964781269691, 4.185964781269691, 4.186076121123775, 4.18614203583668, 4.186336514779313,
4.18658130703899, 4.186717203857391, 4.186814459246516, 4.187191011845767, 4.187444835207639, 4.1877147229296225, 4.18853825293
7292, 4.188822906178882, 4.18887121754647, 4.188986436385682, 4.189120782226434, 4.189552169430373, 4.189768853025962, 4.190414
664275056, 4.190414664275056, 4.190587408202803, 4.190654420004193, 4.1908510866296815, 4.191004129312686, 4.19329601705519,
4.191329601705519, 4.191335513623327, 4.191559225893647, 4.192347948747804, 4.192563835816929, 4.192563835816929, 4.1930565736
79193, 4.193231066242227, 4.193258704767907, 4.193334600146069, 4.193672195762181, 4.193699070546977, 4.193977944643449, 4.1939
77944643449, 4.194245399029119, 4.194246224324754, 4.194284302403589, 4.194477013397029, 4.194539957557572, 4.19457285410453,
4.194683245963741, 4.194775472082749, 4.194775472082749, 4.194776041411322, 4.194851749611327, 4.194854808741943, 4.1948838873
31979, 4.19503188194578, 4.19503188194578, 4.1950735165755635, 4.1950735165755635, 4.195165630377151, 4.1952568628206794, 4.195
314769347232, 4.195314769347232, 4.195537868047431, 4.195686935066843, 4.195755210893026, 4.195826431803157, 4.195904554538462,
4.195956742890489, 4.196167630484611, 4.196349354927607, 4.19676123268477, 4.19676123268477, 4.196803408616742, 4.1969293132709
6, 4.196953164722307, 4.196993540291154, 4.196993540291154, 4.197096713239297, 4.197096713239297, 4.197152599853907, 4.19720501
7570652, 4.1973369798514595, 4.197558636154271, 4.1975735945609225, 4.198042665543059, 4.198068181535475, 4.198479463177847, 4.
198509463681221, 4.198652694888596, 4.198652694888596, 4.198670200108219, 4.1987589234534, 4.198874158183599, 4.19920332536499
2, 4.1992210586926575, 4.199243538494446, 4.199273556338494, 4.199385726045313, 4.199444085702022, 4.199471942012527, 4.1996188
0842191, 4.199643329190929, 4.199707455422144, 4.20001978561602, 4.200230583731856, 4.200385189560308, 4.200503051263125, 4.200
641106362462, 4.200804237016356, 4.200835786243998, 4.200845056593715, 4.200900650645516, 4.201293609689626, 4.201670463203722,
4.201796155867396, 4.2018314052151995, 4.20191097253412, 4.2019513867922695, 4.20214711736024, 4.20214711736024, 4.202308360638
195, 4.202546059867853, 4.202571467673798, 4.202606408036461, 4.202687137631857, 4.202790503037865, 4.20287744385426, 4.2028810
91762242, 4.202916058737419, 4.2030409239164594, 4.203151155047821, 4.203153453047251, 4.20368142723371, 4.203720857848179, 4.
2038936127444435, 4.2038987305254905, 4.2039089728426955, 4.204119387649841, 4.204257689908941, 4.204563521527429, 4.2046152976
08146, 4.204765295195939, 4.204765295195939, 4.2053180394918925, 4.205493423097099, 4.205602197287822, 4.205887371886239, 4.206
3138967631915, 4.20669991332884, 4.206966585403509, 4.207055122970121, 4.207350406410469, 4.207435700889697, 4.208087532444314,
4.20823714311654, 4.208409328295727, 4.208528728200768, 4.208528728200768, 4.208764538520578, 4.208820823089011, 4.208963151126
781, 4.209033197823586, 4.209138321390926, 4.2093358166212935, 4.209580779886467, 4.20988698332547, 4.210067995721865, 4.210067
995721865, 4.210328913270466, 4.210404580104102, 4.210404580104102, 4.210610490144507, 4.21096307399669, 4.210968541746192, 4.2
11015659802944, 4.211227488824865, 4.2115582930300635, 4.2115582930300635, 4.211560674927739, 4.211605280791937, 4.211669112945
2, 4.21217401870613, 4.212384951851667, 4.213088049633577, 4.213478915194689, 4.213791909499214, 4.213876353731099, 4.214004604
065672, 4.214288883409384, 4.214495376196684, 4.214510659304878, 4.214995254608706, 4.215106744445636, 4.215296656772838, 4.215
403826888483, 4.215504419359288, 4.215888789397114, 4.216284675977368, 4.21652609404774, 4.21682715649131, 4.217333830414828,
4.21804237994055, 4.219059259624469, 4.219167405304342, 4.219464630349694, 4.220994599506727, 4.221091141114647, 4.22183787382
3654, 4.2219387982232615, 4.223762631837265, 4.224199131798085, 4.224876023837718, 4.225207635613441, 4.225751607032081, 4.2267
27940799955, 4.226882690503237, 4.22897076580236, 4.22897076580236, 4.230353657303935, 4.232055670606179, 4.233472955211535, 4.
235167599107217, 4.235303905903235, 4.235352329036679, 4.236253769249485, 4.237694769347338, 4.237771572305721, 4.2378980117358
58, 4.238635775748802, 4.239174043437344, 4.239789530105382, 4.240253465798291, 4.240268206928737, 4.240268206928737, 4.2410104
275074865, 4.24126443680047, 4.242112416394328, 4.242254079243412, 4.243080239600518, 4.243467175718766, 4.243638669318644, 4.2
439740695957315, 4.2439740695957315, 4.244315088086026, 4.24511151859545, 4.245274864155775, 4.245597364354811, 4.2465791640435
81, 4.246838408263813, 4.24693813848782, 4.247241477170568, 4.247251262068153, 4.247315598073927, 4.247969382789314, 4.24809962

7793667, 4.248099627793667, 4.24931275855389, 4.2505604321540265, 4.250831136971712, 4.251236391230138, 4.251709574295431, 4.252095558145932, 4.25266364307862, 4.253284349812036, 4.253650740560411, 4.253650740560411, 4.253695456956369, 4.253795113769445, 4.254296870563001, 4.254482317956721, 4.254515311066059, 4.2546181197994075, 4.256325506954221, 4.256398322262514, 4.257027212128085, 4.257279931870933, 4.25810999275169, 4.258174130707302, 4.258452447418746, 4.258568797567984, 4.259231162026568, 4.259427738708481, 4.259514257340016, 4.259514257340016, 4.259710164592498, 4.260145951752741, 4.260145951752741, 4.260166863998996, 4.260166863998996, 4.2605587321260865, 4.260649553711145, 4.261368486497923, 4.261800118809486, 4.262111875360255, 4.262425986875292, 4.262699953952476, 4.263360770282978, 4.263504347718851, 4.263673762427528, 4.263875963887766, 4.264089541344039, 4.264183431160491, 4.264865725407192, 4.26486635337768, 4.2650755718772695, 4.2650755718772695, 4.265130254716308, 4.265210689769407, 4.265931469630072, 4.266016677330446, 4.266016677330446, 4.2664129958543615, 4.266460486972073, 4.266577245420948, 4.266582263888494, 4.266833155301567, 4.266947807781335, 4.267307890608434, 4.267344398512917, 4.267509033804565, 4.267562483493439, 4.268221579578019, 4.268221579578019, 4.268984607295302, 4.2690355524977575, 4.269659404041005, 4.269860192795402, 4.270018440326144, 4.270018440326144, 4.270442347661823, 4.270546940210991, 4.2709867478257, 4.2714095976651185, 4.2714095976651185, 4.27141877769416, 4.2715267524429645, 4.271774089419425, 4.271821171731753, 4.2720461442728785, 4.272274117295003, 4.27230984115113, 4.27230984115113, 4.272433742753448, 4.27261397961804, 4.2731548784331865, 4.273196071125036, 4.273253925424296, 4.2732539254294296, 4.2733474545189685, 4.273459146817095, 4.273528742212553, 4.273728315268261, 4.273984850210659, 4.27409890582845, 4.274530342604877, 4.275074890380983, 4.275392154731394, 4.275399020931454, 4.275416571226622, 4.275838404607714, 4.275841823235976, 4.276881452886306, 4.2769627794147835, 4.277126311923606, 4.277400232778437, 4.277434355578527, 4.277434355578527, 4.277526880196324, 4.277526880196324, 4.278667849105668, 4.278755814759506, 4.278829743102166, 4.278950449048301, 4.279224156549451, 4.279406883451871, 4.279521860883438, 4.279676499954989, 4.279676499954989, 4.280119711018941, 4.280576790443822, 4.280691283052887, 4.280756146915773, 4.281075081798867, 4.281352966039564, 4.281359638881851, 4.281417475385966, 4.281417475385966, 4.281431257259714, 4.281861790467005, 4.282674409241944, 4.282874822245931, 4.283193352850128, 4.2832699941147885, 4.283528035333615, 4.283907677261956, 4.284381358053499, 4.284500502914272, 4.284803887882853, 4.28484848900398337, 4.284862958420505, 4.28510229922738, 4.2853565885051115, 4.2857869043959855, 4.286520616525934, 4.286590612850783, 4.287190043225624, 4.287190043225624, 4.2875076457554436, 4.287933127534571, 4.288663630707524, 4.288965022326941, 4.289120528691905, 4.28929836481481, 4.28965696470401, 4.2898173921210745, 4.289845712476546, 4.29013647545607, 4.290321658921688, 4.290646490717562, 4.290870535496993, 4.290941142422076, 4.290941142422076, 4.291114392039521, 4.291137507945674, 4.291284115649141, 4.291463730536243, 4.291539934914088, 4.291664551493252, 4.292429388261604, 4.292429388261604, 4.292919959095336, 4.293328863516103, 4.293682173867384, 4.294056844360341, 4.294113548687346, 4.2941567236277685, 4.2945779636160015, 4.294790357054949, 4.294976242529584, 4.2953473401226905, 4.295611875641661, 4.295718213505219, 4.295775425899368, 4.296313230397219, 4.296660464727542, 4.297353687138049, 4.297691752751653, 4.29787860030499, 4.297900981589339, 4.297909911405047, 4.298015518978841, 4.298195368468476, 4.298414069719251, 4.2987831215033925, 4.2987831215033925, 4.298828441855242, 4.298902806936728, 4.298968175295817, 4.299682673840793, 4.299749751437485, 4.299845771025382, 4.299845771025382, 4.300165040020884, 4.300266363949417, 4.300640752969605, 4.300795541083984, 4.300862400656219, 4.300975745868453, 4.300975745868453, 4.301059009758427, 4.301387698401361, 4.301523706931984, 4.301814965074194, 4.301964234821008, 4.30196423482 1008, 4.302002166139763, 4.302158546689443, 4.302294368051589, 4.3023528873136065, 4.302600600139784, 4.30267500460287, 4.302885126495031, 4.30293336538339, 4.3032143887893755, 4.303223798640672, 4.303346523683725, 4.303420249418679, 4.3035370980780785, 4.3038310970304146, 4.304260770002585, 4.304277048970191, 4.304437132450722, 4.304548064572073, 4.3045583503579925, 4.30457344930693, 4.3045909691846695, 4.305056723421696, 4.305155293485439, 4.305194043234714, 4.305194043234714, 4.305254234027837, 4.305352178246793, 4.305564924346652, 4.305581926850699, 4.305733225068983, 4.30573801524696, 4.3059284494404855, 4.306032405575424, 4.306072026588934, 4.306197116683213, 4.306219343468527, 4.306250070584845, 4.306278896919238, 4.306400070158491, 4.306428520536533, 4.306516750375086, 4.306516750375086, 4.3066955340615305, 4.306779232184355, 4.306934921865283, 4.30711813072451, 4.30711813072451, 4.307164390758213, 4.307313426198383, 4.307313426198383, 4.307348696364568, 4.307361218593435, 4.307541286784999, 4.307812212240869, 4.307880551371625, 4.307880551371625, 4.307971453111977, 4.307979082335046, 4.308222043472858, 4.3084999389 13915, 4.308544641440222, 4.308544641440222, 4.308598217834508, 4.3086225341805395, 4.3087803887720835, 4.308865049352041, 4.30932 1163987525, 4.309682599548175, 4.310024884653713, 4.310026208139711, 4.310243202411855, 4.310495449014335, 4.310533449038337, 4.310567938370643, 4.310580868721256, 4.310615741514274, 4.310635488491228, 4.310820785214679, 4.310835690909598, 4.311057870912094, 4.311200759027708, 4.311259649416695, 4.3112994113839855, 4.311639125089803, 4.311677858121645, 4.311691886142858, 4.3117

59622901762, 4.311858700177957, 4.311863058586059, 4.312156083202308, 4.312201550104204, 4.312209798722172, 4.312515736327128, 4.3127267205238455, 4.312808021056172, 4.313129155367333, 4.313164118376413, 4.313164118376413, 4.313278943429751, 4.313300855322577, 4.313374218057791, 4.313479366331846, 4.313479366331846, 4.313547260926531, 4.313705481922449, 4.313722704778137, 4.314134476423482, 4.314292228000405, 4.314375050890076, 4.31452693863905, 4.314568665099093, 4.314985380124567, 4.315218970976172, 4.315389137534058, 4.315393754094079, 4.315486306452723, 4.315629568657579, 4.315629568657579, 4.3157658188047945, 4.315857841873051, 4.315857841873051, 4.31594292875481, 4.316376652840592, 4.316436246650821, 4.316462165612364, 4.316784913714161, 4.316893206611094, 4.316968459291271, 4.317009182788872, 4.3172164556069115, 4.31742580621452, 4.31742580621452, 4.317447465137453, 4.317453058582892, 4.317715109958673, 4.317715109958673, 4.318022058354482, 4.318107931384357, 4.318170894533949, 4.31826198404881, 4.318328666898339, 4.318343439887392, 4.318604433870506, 4.318683014856911, 4.318833664365193, 4.318833664365193, 4.3188887377796975, 4.318917661973306, 4.318917661973306, 4.3190149612211615, 4.3192794941643715, 4.31959587085116, 4.319623356782067, 4.319632510460628, 4.319719613416691, 4.31980276507684, 4.3199743142413265, 4.320189501950566, 4.320382767117649, 4.32050314436923, 4.32099511658547, 4.321137825443808, 4.321170843268376, 4.321355852894105, 4.321514124423365, 4.321736735643554, 4.321744492160331, 4.322209624412293, 4.322344640476603, 4.322428199041185, 4.322818487692867, 4.3229403268835895, 4.323015586489893, 4.3233040379928385, 4.323493922062301, 4.323493922062301, 4.3241460579060265, 4.3241994076773445, 4.324540398843765, 4.3250037047252095, 4.325039296574932, 4.325260708560038, 4.325594723557663, 4.325694077715139, 4.325737890739084, 4.325838194877583, 4.32594430298273, 4.326102388083414, 4.3267819785687385, 4.327009719332977, 4.327387727121539, 4.327457135826467, 4.327542634140329, 4.327574852133107, 4.32812502796534, 4.3282324207603935, 4.3284139267568165, 4.328603283049382, 4.328901704457065, 4.328933211449515, 4.328933252371539, 4.32905070374229, 4.329068209498345, 4.3290892940270265, 4.329096080034363, 4.329224583337744, 4.329224583337744, 4.329319066818276, 4.3295465849236345, 4.329709241751941, 4.330745162945653, 4.330834928529755, 4.331440091632239, 4.331467485998851, 4.332000913917841, 4.33315460624588, 4.333288670938049, 4.333849450946545, 4.334016429339703, 4.334076535135391, 4.334687674063752, 4.336064985485713, 4.336750609521822, 4.337039541345856, 4.337598541825097, 4.337664904907964, 4.379047397995025, 4.338085753480964, 4.338085753480964, 4.339664445690838, 4.3406236467983215, 4.34133733275397, 4.341818381268153, 4.342724596301081, 4.34303322249344, 4.343992749535691, 4.343992749535691, 4.346161819034748, 4.346975839030445, 4.34743986743239, 4.3478399944857085, 4.3478399944857085, 4.348906014628826, 4.3492435719582145, 4.34973675484219, 4.350805129477549, 4.350876958778651, 4.352341684823654, 4.3523634731033685, 4.3529792454394425, 4.354686618889741, 4.356250827696582, 4.356313605007758, 4.356712859149957, 4.356842649256725, 4.357271168018403, 4.357439840315538, 4.357746172643278, 4.358119362739212, 4.358642521450777, 4.359127383494933, 4.359710851959839, 4.360401083147432, 4.36041439227933, 4.36077830565386, 4.362661507740634, 4.363122792584718, 4.363296358743741, 4.363471886880012, 4.363693381327038, 4.3638710051304885, 4.364054971140787, 4.364261327943652, 4.364261327943652, 4.36556812187789, 4.365605818234406, 4.366290512737477, 4.367263203245398, 4.367375399575159, 4.3675894805942, 4.3679560711974235, 4.367988639742301, 4.367988639742301, 4.368612157627843, 4.368654548704571, 4.369546253814004, 4.369646744006738, 4.369883759401694, 4.370576065793676, 4.371721075517012, 4.372072883563115, 4.372555800961451, 4.372879771080009, 4.373120634871099, 4.373668313892971, 4.375281022222318, 4.375534003892862, 4.376258215130503, 4.376675553122798, 4.376675553122798, 4.37691804532341, 4.377771193926652, 4.377839787466052, 4.379278756035734, 4.379278756035734, 4.37947035245186, 4.38031659096355, 4.3804917468994375, 4.3804917468994375, 4.38052508961607, 4.380545059075319, 4.3817111634552735, 4.382009084864226, 4.382171107762189, 4.382205012483417, 4.382336570735235, 4.382533046433788, 4.382536244805036, 4.382873011957976, 4.3829008803892355, 4.382933135829508, 4.38297739979392, 4.38305187211585, 4.383069398436645, 4.383134062168641, 4.383445768413462, 4.3835193222763, 4.383582198420597, 4.383940829051094, 4.3841762103610575, 4.38432714315977, 4.3849249183235965, 4.385045370514705, 4.385351985505988, 4.385594784270459, 4.3856684459839235, 4.386337500603206, 4.38655092360525, 4.38659335061171, 4.386845380415451, 4.386953188227586, 4.387004363131153, 4.387215728900726, 4.388394225682444, 4.3888427968685555, 4.3888427968685555, 4.389134740028865, 4.389170890888151, 4.390452050800561, 4.390609556394487, 4.390822264289428, 4.3912079625315625, 4.391315294577696, 4.391867580504861, 4.391867580504861, 4.392002281888127, 4.392354502968067, 4.3925891923122276, 4.3925891923122276, 4.392989781474599, 4.393044036793947, 4.393113247978094, 4.393184685762376, 4.393463935014604, 4.394032540400113, 4.3941729441987825, 4.394337996655612, 4.3943762057297215, 4.3943762057297215, 4.3947233076628685, 4.3951428070999174, 4.395220192269929, 4.395250477589823, 4.395289157147505, 4.396929562528795, 4.3970269183932835, 4.3974277344761585, 4.3974277344761585, 4.397466097172291, 4.397662433055301, 4.397939715170427, 4.397997236757169, 4.398020128575202, 4.3982112299039615, 4.3982112299039615, 4.398385099249234, 4.39940534945045, 4.399514228690712, 4.399849842734019, 4.400146982103233, 4.400146982103233, 4.400183210924582, 4.4003

92908326306, 4.4004571157110115, 4.400704262591707, 4.401015179601162, 4.401215718746305, 4.401215718746305, 4.401345555721143, 4.401369836765876, 4.4015306235536045, 4.401688059555387, 4.401688059555387, 4.402045953880785, 4.402045953880785, 4.402152879690212, 4.402287641124476, 4.4026983669087265, 4.4026983669087265, 4.402923836153464, 4.402923836153464, 4.40299250384376, 4.404075707318831, 4.404460264046751, 4.404601613437186, 4.404677927881287, 4.4048239927876915, 4.405009737613061, 4.405578443929674, 4.405669776689502, 4.405741631932718, 4.405900535317317, 4.405985919445494, 4.406133951567956, 4.406133951567956, 4.406934093607734, 4.406957878460668, 4.407824511588753, 4.407973947587313, 4.408058352359939, 4.408360375388515, 4.408852522928701, 4.408852522928701, 4.409002057754527, 4.409012035976481, 4.409012035976481, 4.409096198121101, 4.409122011968576, 4.409265299950723, 4.4095048820905385, 4.409554446705431, 4.409931168591055, 4.410050066044323, 4.410725019345251, 4.410871980907121, 4.410946630410259, 4.411261937094377, 4.411736638862549, 4.411908430313598, 4.412009908581009, 4.412261429330446, 4.412406713191162, 4.412838274046358, 4.413037487797468, 4.413059764380847, 4.413266502636617, 4.41346904009814, 4.413863552960574, 4.413863552960574, 4.4140195885440585, 4.414023985669465, 4.414023985669465, 4.414112113758349, 4.414623124025093, 4.414828207791441, 4.41500050763879, 4.415202962589443, 4.415213349054362, 4.415273773881948, 4.415301411867777, 4.415550006182083, 4.415569582555597, 4.415807300651997, 4.415840031806854, 4.416006887458629, 4.41685264863278, 4.417035075104871, 4.417336653842285, 4.417379963524492, 4.417541434241645, 4.417624432640984, 4.417799534359032, 4.417860415232316, 4.418008555742202, 4.418028125198312, 4.418380000298435, 4.418384151055017, 4.418809133553226, 4.418823034255789, 4.418831987079479, 4.418897759039207, 4.4190334085803915, 4.419038320685922, 4.419244481997339, 4.419296742785918, 4.419483543606851, 4.419634399011875, 4.419698990234383, 4.419725064069729, 4.4199759158176235, 4.420093107930846, 4.420149006213235, 4.420196028730996, 4.420196028730996, 4.420269494831078, 4.420269494831078, 4.420373877707846, 4.420373877707846, 4.42043765219111, 4.420553958067868, 4.420585648853034, 4.420752970868822, 4.421099040624859, 4.42143248633123, 4.421579182674207, 4.4215897306057395, 4.4215897306057395, 4.421646659132506, 4.4217494988476505, 4.421921327810213, 4.422081680331521, 4.422134021036977, 4.422166341712503, 4.422667409973792, 4.422888831075008, 4.42295843517825, 4.42343431283245, 4.42356499981446, 4.42356499981446, 4.42364505904144, 4.424065547529723, 4.425570024646524, 4.425570024646524, 4.4256070931416165, 4.426008911230147, 4.426074249727984, 4.426247348528673, 4.426501379413854, 4.427082725831679, 4.427172246073374, 4.427181729656193, 4.4273077671272665, 4.427449050953652, 4.42767352103296, 4.427784627966241, 4.427818591851673, 4.427851831649493, 4.428026893215863, 4.428175186215696, 4.428254356314165, 4.42828975849359, 4.4285892816602805, 4.428610492679916, 4.429022134235284, 4.429214599994381, 4.429265294123341, 4.42929958005515, 4.429447567843229, 4.429667558679672, 4.4299351026466648, 4.430063785336428, 4.430090758993832, 4.430899518645581, 4.431135744892716, 4.4312828375837965, 4.431288179610332, 4.4313972909649, 4.431567360926258, 4.431567360926258, 4.431756889346485, 4.4318626209189995, 4.431977839464206, 4.432154031822002, 4.432254775998119, 4.432903446971686, 4.4333272198027105, 4.433350351416079, 4.433537445270712, 4.433555298201206, 4.433672542648353, 4.433742714437103, 4.433742714437103, 4.433801499456524, 4.433837865653471, 4.433902610689993, 4.433997699206743, 4.434144116351583, 4.434173416162658, 4.43542575078657, 4.43542575078657, 4.435531549339975, 4.435657817010198, 4.4358526708273365, 4.436823311136669, 4.4368530698934086, 4.436854311392991, 4.436869867004651, 4.437075272315244, 4.437101506337352, 4.437220220471677, 4.437699194405571, 4.43777656513403, 4.4381510365429815, 4.438255656030908, 4.438255656030908, 4.4388035423649, 4.43896668809824, 4.4390021124543235, 4.439416263862481, 4.439424201534392, 4.439431548932602, 4.439431548932602, 4.4394551485575796, 4.439455148575796, 4.439660539613397, 4.439854926416746, 4.439854926416746, 4.4399590624304, 4.440170567341561, 4.440196767083211, 4.440258142354553, 4.440364773910382, 4.440551814272495, 4.4406232836034, 4.441064533478032, 4.441083358424626, 4.441083358424626, 4.441503434225663, 4.442093894768989, 4.442392146829659, 4.442907466197319, 4.443104515062493, 4.443120620322313, 4.443621226221728, 4.443721382422357, 4.443875628818398, 4.44393615460652, 4.444176368741634, 4.444554365386512, 4.444561343496876, 4.44489245910594, 4.445014681085395, 4.445258185909977, 4.446023297148414, 4.446126139367386, 4.446279042255204, 4.446310266395805, 4.446881461988162, 4.4469193785011205, 4.446974808791413, 4.447390525176332, 4.447531266872175, 4.4478235881212009, 4.447866269534165, 4.448229856016851, 4.449187715105232, 4.44922669571842, 4.449800622268465, 4.450476978567681, 4.450509954014312, 4.451022902164448, 4.451222195531725, 4.451284580133624, 4.451402660436434, 4.452796816280607, 4.455169742928052, 4.455577463603827, 4.456017617164012, 4.45651665250739, 4.45957114713803, 4.45957114713803, 4.46044215762824, 4.46054459242906, 4.461062605388138, 4.461617228033252, 4.461978577981949, 4.462929945999691, 4.462981410891069, 4.462981410891069, 4.463194546180211, 4.4638460240321285, 4.464860329281601, 4.465291512714777, 4.466528308893436, 4.467228787884106, 4.467234041783037, 4.467784428353283, 4.467919425403954, 4.470293689235266, 4.470432127898108, 4.471576700395133, 4.471596177875754, 4.4725254767193015, 4.472681112324026, 4.474105371322869, 4.475420816779443, 4.475747882482962, 4.475747882482962, 4.475772631380865, 4.4759569160799

08, 4.478652908730617, 4.478844176417561, 4.478844176417561, 4.47902522499269, 4.479887323769378, 4.48088788855417, 4.481237733560181, 4.481416310504076, 4.482265152917323, 4.48314049067313, 4.483325549329907, 4.483797941249868, 4.484020380629953, 4.484233352394399, 4.484233352394399, 4.485205171562619, 4.485363093509814, 4.485519251476124, 4.485545622149478, 4.486098771496099, 4.486180835144979, 4.486484126589617, 4.487254942458393, 4.4874432791648395, 4.48774580343785, 4.488273081456135, 4.488273081456135, 4.48878411757954, 4.48886915128972, 4.489492009258444, 4.490979277453942, 4.4910344807941165, 4.4918684744253845, 4.492612181584027, 4.492619821150414, 4.492910162594334, 4.493164689143805, 4.4946792709093435, 4.494827774733309, 4.494900968840168, 4.495992983324216, 4.49626658496681, 4.496522449648791, 4.496664530049407, 4.496684993305233, 4.496737457192926, 4.496737457192926, 4.496814315301367, 4.496823792507594, 4.497299898298037, 4.497376458465768, 4.497376458465768, 4.497613886259528, 4.49810479329452, 4.49838246386211, 4.498523885550317, 4.498583913062112, 4.4990907161768465, 4.499152423900567, 4.499152423900567, 4.499552227863794, 4.499937424556716, 4.500919754937439, 4.5010826654276075, 4.501144775912205, 4.502116098205032, 4.502121968760802, 4.502329537433134, 4.502428878516192, 4.502428878516192, 4.50251587037103, 4.50251587037103, 4.502822965690743, 4.502822965690743, 4.503382815898436, 4.504140962432403, 4.504358823727615, 4.50456493265823, 4.504756232334218, 4.505009006973765, 4.505208610452795, 4.505654862785331, 4.505819725350434, 4.50594847692125, 4.50610492277349, 4.506216666101483, 4.506273922669975, 4.506385089840615, 4.506443224616527, 4.506789701610242, 4.506974567057363, 4.507569444647523, 4.507636171155099, 4.507930816913099, 4.508540231959329, 4.510058583132159, 4.510058583132159, 4.510140887743458, 4.510547416790025, 4.510557776555251, 4.510857467037604, 4.510864046437171, 4.51088782407624, 4.51088782407624, 4.511042839513113, 4.511148582047842, 4.511493055838149, 4.51210503123315, 4.512299167896206, 4.51266244458146, 4.512983803570697, 4.513585791646378, 4.514479980078835, 4.514679740155429, 4.515682603184941, 4.5159059373767985, 4.516179204397449, 4.516352841493541, 4.516393246263426, 4.516576927151947, 4.516898151910639, 4.51741970317982, 4.51763847677228, 4.517709262231504, 4.5181608526816435, 4.518497356624366, 4.518497356624366, 4.5191515358160315, 4.519522093834868, 4.519606055651488, 4.519834237361308, 4.520032647089242, 4.520434519818897, 4.520711831265529, 4.52154286985911, 4.521566935915506, 4.52187268152731, 4.521985843000894, 4.522021040646705, 4.5220785685064255, 4.522106738284094, 4.522536649289868, 4.523308624170146, 4.523450058934886, 4.523599087992312, 4.523932353780531, 4.524104544720358, 4.524149164420862, 4.524202404288524, 4.524614218591404, 4.5246896906614795, 4.524885980562726, 4.524921596580338, 4.525001453066323, 4.525069936283859, 4.525599498740518, 4.525838390555249, 4.525984358714741, 4.526024140854766, 4.526183770395448, 4.526245921159084, 4.526628918915932, 4.527033889327057, 4.527106398977919, 4.5273150983396535, 4.5273150983396535, 4.527604787854644, 4.527721049261393, 4.527728090948508, 4.527823717412441, 4.527961644190084, 4.528163260115349, 4.528163260115349, 4.528433594494282, 4.5284637612571705, 4.5284637612571705, 4.5285434943188525, 4.528593757433826, 4.528763738164782, 4.528817310558025, 4.529288140547976, 4.529293293667515, 4.53085024224592, 4.5310292003218064, 4.53118206817527, 4.531477222499499, 4.531540693218645, 4.531628410750172, 4.531950639405108, 4.531950639405108, 4.532010536580224, 4.532394019639626, 4.532394019639626, 4.5329030131481085, 4.533355309551299, 4.533667526866255, 4.53373849214339, 4.533779736713036, 4.533779736713036, 4.533805843157264, 4.534366151387661, 4.5344518705401695, 4.5344518705401695, 4.53516500515057, 4.535246279548757, 4.535639358285607, 4.535778857471097, 4.535885910621494, 4.535950189529229, 4.536217251263185, 4.536288567576391, 4.536295674513152, 4.536349959708497, 4.536531145878401, 4.536200002933223, 4.536896275484166, 4.536977953254549, 4.537057050674845, 4.53731822782245, 4.5375646579341815, 4.5376692931914, 4.53777913356125, 4.53777913356125, 4.537837310111104, 4.5380113145626755, 4.538204687074563, 4.538374429505624, 4.538422514479187, 4.538462459865942, 4.53872812624429, 4.53904824739447, 4.53910054230103, 4.539149353166699, 4.539276156731454, 4.539276156731454, 4.539312044305184, 4.539579531740545, 4.539599649002489, 4.5396282118075035, 4.539721833119262, 4.5400181581741235, 4.540026855091518, 4.540359252047793, 4.5404221857013045, 4.540666908790983, 4.540666908790983, 4.5406738711003385, 4.541050617266881, 4.54163657508134, 4.541664521457256, 4.541894737781526, 4.541981212596877, 4.542107832541839, 4.542171107643826, 4.542267499771834, 4.5425281096956, 4.542646905159188, 4.542704782961365, 4.5428518479302324, 4.542868158161479, 4.543295246362402, 4.54354942396933, 4.543649537666184, 4.54376495796766, 4.543905873762114, 4.544088989912377, 4.544092230519505, 4.544179428120878, 4.544200994285559, 4.5442741351619516, 4.544390520748973, 4.544757955752762, 4.544757955752762, 4.5447658312098245, 4.545118347838753, 4.5453527044006075, 4.5457105436758365, 4.5457105436758365, 4.545828940290625, 4.545877077936985, 4.545935091780296, 4.545979272218192, 4.545985796459889, 4.546299213997613, 4.546556120976064, 4.546847749044306, 4.546968021003683, 4.547093884763179, 4.547651676581026, 4.54772496360314, 4.54840797155662, 4.5484518807257635, 4.5490222078535005, 4.549022207853505, 4.549238741968647, 4.549711360688427, 4.549947361929071, 4.550105808247674, 4.550105808247674, 4.550354786549337, 4.551237087300083, 4.551237087300083, 4.551558738840168, 4.551735275463727, 4.55178754177411, 4.551825464707922, 4.552169010613522, 4.55

3118144668492, 4.553313271162244, 4.553337271365923, 4.553917356473307, 4.5542683788209875, 4.5542683788209875, 4.5543175072108
72, 4.554642538311924, 4.555805917862418, 4.556430719029152, 4.556430719029152, 4.556471720977909, 4.556994343952987, 4.5574990
89790514, 4.558060818042418, 4.558092937762975, 4.559306014141003, 4.55993406348413, 4.5606252025689775, 4.560724040000334, 4.5
612885429325996, 4.561285429325996, 4.561446536725046, 4.561880819946465, 4.562531408610017, 4.563813647596819, 4.564095391778
116, 4.564143087808148, 4.564237214217088, 4.564237214217088, 4.564780964774217, 4.565174317165792, 4.565202861792932, 4.565837
863106448, 4.56800673508351, 4.568736235043621, 4.5700474099100115, 4.5735971900038335, 4.575361906695299, 4.575503133511667,
 4.575503133511667, 4.576453982746458, 4.577211120049754, 4.57884531314866, 4.579100977532704, 4.580109973152755, 4.5810689422
61946, 4.581268439178234, 4.581268439178234, 4.582060477535471, 4.582213594359197, 4.582989664313424, 4.5836224852766705, 4.583
879227601416, 4.583890592725118, 4.584810202366826, 4.584857462057885, 4.584967407332958, 4.585402548243108, 4.585454387030146,
4.586045376353558, 4.586788753330657, 4.5870909405024, 4.589311593329809, 4.590313968546523, 4.59052306626516, 4.59171661730998
9, 4.5922467422813416, 4.593094354961309, 4.593156971090353, 4.5937703579703255, 4.593788600257892, 4.595656554374609, 4.595874
379262489, 4.596327400114853, 4.596387506650846, 4.596487726395298, 4.597053579825439, 4.597351761358191, 4.59814822767558, 4.5
98703831292387, 4.598703831292387, 4.598770462084405, 4.5993951564047215, 4.599631375971564, 4.600156266502335, 4.6003836122161
85, 4.600911412973483, 4.6016942252790365, 4.601846299980098, 4.602422838975315, 4.602434886952904, 4.603141513252948, 4.603173
543838928, 4.603599342639149, 4.604371659486706, 4.604663056429084, 4.6047033735081735, 4.605154460576427, 4.605189509015262,
 4.605545079030612, 4.605723287186482, 4.605723287186482, 4.605811589514085, 4.6070053914855595, 4.60719980818309, 4.6076107320
83744, 4.607610732083744, 4.608071596179249, 4.609157271007175, 4.609389482874007, 4.609449988884228, 4.609617692273538, 4.6100
00170562909, 4.610000170562909, 4.610406292532887, 4.610738212574717, 4.611848684100794, 4.612073299039047, 4.612073299039047,
 4.6123149842072335, 4.612381330805615, 4.61313927065612, 4.6132223131667285, 4.613623009936481, 4.614530626886594, 4.614561185
363324, 4.614672963199155, 4.614850358514372, 4.615105212886121, 4.6155209431495, 4.616300160341995, 4.616746555942909, 4.61676
5017570501, 4.616797638303715, 4.617408577970542, 4.617486533288121, 4.617623113248905, 4.61815484482762, 4.61836675266513, 4.6
18498173543389, 4.618785269370407, 4.618978409017306, 4.619094322285167, 4.619169831789571, 4.619584529770742, 4.61958452977074
2, 4.619895109389046, 4.620157864913254, 4.620330525473898, 4.620657936362528, 4.6210780478488, 4.621218444980153, 4.6218146422
434065, 4.622007109652327, 4.622196816032653, 4.622074136000435, 4.622074136000435, 4.622282485444029, 4.6223075497544786, 4.
6223075497544786, 4.62242841118908, 4.622851467872972, 4.622851467872972, 4.623402295468987, 4.623402295468987, 4.6239379783188
2, 4.624932839965115, 4.625018935907087, 4.626209115523089, 4.627721273389875, 4.627822951457824, 4.62832486601715, 4.628408607
847779, 4.628505307254118, 4.628627311905309, 4.628627311905309, 4.628805260847246, 4.628994307553973, 4.629146402527145, 4.629
146402527145, 4.629212820881282, 4.6293712751174344, 4.629495499776056, 4.629748253507591, 4.62990340892764, 4.630543767457778,
 4.630756620055309, 4.631084861538481, 4.6311031245407746, 4.6311031245407746, 4.631107957427209, 4.631294680009889, 4.63165307
0579109, 4.6318607088798975, 4.631952742252761, 4.632204776343185, 4.632585792122898, 4.632789596943094, 4.63282408194479, 4.63
2836960006606, 4.632836960006606, 4.633476039694794, 4.633476039694794, 4.6337194770665295, 4.633737434161838, 4.63389799578407
6, 4.634217762494633, 4.634389617831415, 4.634496821948419, 4.634804710629926, 4.6349438858142396, 4.635004469598381, 4.6351952
78627552, 4.635271525520605, 4.635470283164925, 4.635618815541686, 4.636301472187087, 4.63652877924292, 4.636605760059823, 4.63
7112701510783, 4.637306884821577, 4.637353536288445, 4.637382485785067, 4.638137760982268, 4.63852462535641, 4.638687396360658,
4.638840107987012, 4.639142868690407, 4.639142868690407, 4.639156868890243, 4.63966957151659, 4.639753643275542, 4.639819473228
124, 4.639819473228124, 4.640224335473047, 4.64032642856182, 4.640357313118801, 4.640357313118801, 4.640366530877118, 4.6406105
30274459, 4.640745490366176, 4.641239547341072, 4.641422476037503, 4.641559134881105, 4.641708531488843, 4.641787772646268, 4.6
41865799385567, 4.642051719980685, 4.642133002007396, 4.64219979311137, 4.642273099426509, 4.642358755892935, 4.64254154856614,
4.643522637171038, 4.643954563669546, 4.644221544989647, 4.64449922348868, 4.6450948309437425, 4.645480823698939, 4.64550312531
9166, 4.645772614685355, 4.645797366827192, 4.6459919181287255, 4.646095857424278, 4.646376704127141, 4.646379224417007, 4.6465
22869798849, 4.646612837679604, 4.646728686310453, 4.647036906896577, 4.647887698970914, 4.648147707373309, 4.6483502044359275,
4.648556102360174, 4.648825669716694, 4.648888016628033, 4.6491412007317825, 4.6491412007317825, 4.6495229909254805, 4.64952504
2432035, 4.6496070727378775, 4.649630556077433, 4.649691717126108, 4.649868916492149, 4.650267675023296, 4.650267675023296, 4.6
50515864215527, 4.650561597946556, 4.650668621600727, 4.6506979818679435, 4.651052078262675, 4.651078860670491, 4.6519593493745
21, 4.652048396860074, 4.652150502841279, 4.6521669517272235, 4.652214890594241, 4.652414803186998, 4.652487192338093, 4.652709
665529174, 4.65307949128819, 4.653940499455488, 4.654074498180859, 4.654536459417344, 4.654927951295827, 4.6555594252544745, 4.

655744266324193, 4.655902856500611, 4.656500022272922, 4.656839140888268, 4.656839140888268, 4.657164964427556, 4.657223070764423, 4.65728441312026, 4.657525071781048, 4.657808121717282, 4.6579139312712785, 4.657914673633509, 4.657925281242658, 4.658327135207239, 4.658364841116435, 4.658660560314477, 4.658947467273015, 4.658966263196502, 4.659208555766091, 4.6596969450649635, 4.659800250293549, 4.659847390265836, 4.660058218641518, 4.661343361064948, 4.661417293977628, 4.66187534167435, 4.66194020268744, 4.66194020268744, 4.662584017531158, 4.662585385129853, 4.6629115485567025, 4.6629115485567025, 4.664559963693726, 4.665239317840645, 4.666302236800433, 4.667510930008147, 4.66956627729188, 4.669786642805457, 4.670186878718667, 4.670186878718667, 4.673063869881056, 4.6741726038441485, 4.67446150423523, 4.675687980046296, 4.675687980046296, 4.676140822670386, 4.6766918545253064, 4.676907611932135, 4.677804567427295, 4.680069843741524, 4.680069843741524, 4.680997668058147, 4.681297868675549, 4.682317645215076, 4.6830532110814325, 4.683978171385338, 4.683978171385338, 4.684169018367633, 4.686089449282174, 4.686306557070153, 4.686561746376123, 4.686652000385592, 4.6875654517960745, 4.68768693527485, 4.6882878906000895, 4.688437416341405, 4.688571844270841, 4.688672711345283, 4.689705842607635, 4.691017440044188, 4.695026634613454, 4.695489585961992, 4.695571466517003, 4.6957038821609745, 4.696352308777026, 4.696352308777026, 4.697422761470509, 4.698763008136428, 4.698836579662028, 4.699404434219589, 4.699995608181752, 4.700221422223462, 4.700492758146905, 4.700804709019021, 4.701910698523592, 4.702027599385434, 4.703309701379422, 4.703527251774257, 4.70406214 0430169, 4.7043187548454375, 4.704795935332054, 4.705375052534931, 4.705989882216476, 4.706652329324859, 4.7067745957871745, 4.707737644403264, 4.707852957031211, 4.708507239160616, 4.708871579327115, 4.709065400762655, 4.709169965468027, 4.709485508806038, 4.709928510688772, 4.710628437737071, 4.710628437737071, 4.711647510525617, 4.7127772666280245, 4.712795732639101, 4.714135373352726, 4.714527462768275, 4.715072108452708, 4.715468286836532, 4.715623646901626, 4.716178610889159, 4.716195579650258, 4.716564769565311, 4.716564769565311, 4.716662040092646, 4.716801840700874, 4.71723147426356, 4.71723147426356, 4.717488912772958, 4.717616161461426, 4.7190016244141075, 4.719019057548144, 4.719241647262872, 4.719328238267863, 4.719391197034772, 4.719491215168833, 4.719727130579686, 4.719727130579686, 4.7199726339142805, 4.720501486192162, 4.720745168471349, 4.720833960534956, 4.721274703153537, 4.721274703153537, 4.721525342588789, 4.721525342588789, 4.721681475203512, 4.722847046529829, 4.722879114532033, 4.723264508670955, 4.723981852959735, 4.724827261743099, 4.724861999647948, 4.725782793482657, 4.725980098046824, 4.72599501262117, 4.726632150095382, 4.726632150095382, 4.726637210031774, 4.726664853496775, 4.727110727126577, 4.727167594297674, 4.72802248972818, 4.728419484920326, 4.728461556710568, 4.728646744882522, 4.728763524524995, 4.729249393924704, 4.729458744247636, 4.729875582871599, 4.729875582871599, 4.730082098586512, 4.730124611486484, 4.730782868303923, 4.730944433187365, 4.731033393755375, 4.731033393755375, 4.731254162226046, 4.731542771602715, 4.732139963136027, 4.732371734325742, 4.733682169960763, 4.733903435734755, 4.733925589369823, 4.733980085307122, 4.735472090344873, 4.735784571150386, 4.735998019344576, 4.736025393301897, 4.736304593374691, 4.7366893497000495, 4.7366893497000495, 4.736868332072091, 4.736894567814197, 4.737280978116055, 4.737365238121126, 4.737478876749856, 4.73759125069028, 4.737830358811901, 4.738322987813228, 4.738779127496506, 4.738779127496506, 4.739342360579237, 4.739592913092232, 4.740277088782996, 4.740915086067854, 4.740927233689954, 4.74093311680589, 4.741038966547661, 4.741235292735182, 4.741251639685154, 4.741283497939246, 4.741352510115138, 4.741471808308896, 4.741636976666848, 4.741658338552873, 4.741773938422732, 4.741856157268221, 4.741856157268221, 4.741900254345847, 4.742524002356972, 4.742524002356972, 4.742689888752824, 4.742942605270083, 4.743094403933695, 4.743123307461196, 4.743409944916604, 4.74385034104034, 4.74385034104034, 4.7440437024142925, 4.7446514284652705, 4.744702966945561, 4.744953778711553, 4.745077291553384, 4.7454608762189165, 4.745505349918629, 4.7455743991807315, 4.745575936552726, 4.74593997248119, 4.746302946650495, 4.746303056895519, 4.746327076791593, 4.746334839830673, 4.746382076976834, 4.746526649987403, 4.746847348979111, 4.7471155895886925, 4.74765590423684, 4.747973701707309, 4.747973701707309, 4.748329780013079, 4.748482141476101, 4.748639023041503, 4.7491151388039485, 4.749926708001475, 4.750516607737648, 4.75060809816909, 4.75060809816909, 4.750897455551602, 4.751090526284244, 4.751832955509105, 4.751832955509105, 4.751844699111835, 4.7525651395246555, 4.752742285450094, 4.75334405899811, 4.753595186599042, 4.753667033975787, 4.754417719201532, 4.754590816008611, 4.754937356466079, 4.75535399583811, 4.755375513384331, 4.7563271904887, 4.7564632398886255, 4.756557357385163, 4.756615006805346, 4.756776324795996, 4.7569122310291165, 4.7569122310291165, 4.757465416735731, 4.757523287805011, 4.757800240426461, 4.757800240426461, 4.757860248980928, 4.758095585833392, 4.758271706817428, 4.758399567659357, 4.758445472864603, 4.758645595571286, 4.759300370311553, 4.759300370311553, 4.759532746218661, 4.759908167971144, 4.759988926704389, 4.760351386066688, 4.760542206122056, 4.760542206122056, 4.760628796090544, 4.760690726640441, 4.7607450533 8836, 4.760767060745292, 4.760880028600559, 4.761131028881412, 4.761268614915358, 4.761365131309871, 4.761552440664815, 4.761874387412407, 4.762031118942935, 4.762213997409534, 4.762395145903341, 4.7636317083168125, 4.764113868362249, 4.764357396402097,

4.764382051693366, 4.76454254058694, 4.76511890166727, 4.765221194764583, 4.765221194764583, 4.765284597216494, 4.76580898838796, 4.766107914869633, 4.766312490626114, 4.766565391898042, 4.766721255569959, 4.767327020995682, 4.767375839874146, 4.767855747006868, 4.768022377878859, 4.768022377878859, 4.768024735734418, 4.76816254605692, 4.768197392613805, 4.769125314247045, 4.769166581528837, 4.770606512788115, 4.770924869426515, 4.771713555530346, 4.772409266653393, 4.773659164932732, 4.775400830210238, 4.776979855292292, 4.777679893231537, 4.77890474379969, 4.782080099743617, 4.783224285357515, 4.783735550811471, 4.783895311826739, 4.783895311826739, 4.786034858857613, 4.786188220906169, 4.788059063459798, 4.789102289956084, 4.790368234314146, 4.790373185532664, 4.790373185532664, 4.791124190405734, 4.791777727095163, 4.7924931962543456, 4.793310423489, 4.793798956410729, 4.794128232733352, 4.797573922439764, 4.798177311827403, 4.79881284991136, 4.79882372131662, 4.799252069638597, 4.799866645631976, 4.800798671789446, 4.800798671789446, 4.803159436909421, 4.805399872380864, 4.805497464793079, 4.80705720037656, 4.807414834914438, 4.80779988512909, 4.808609367956052, 4.80871356036832, 4.8091543477605665, 4.8099592686874795, 4.810900573285432, 4.8109583081407346, 4.811177077777502, 4.811713015346952, 4.81249276322411, 4.812777915120034, 4.813499225786584, 4.813896114973359, 4.814442856868969, 4.8147431387245465, 4.814871707824163, 4.815080271439219, 4.8152537889920515, 4.816169551167059, 4.816425279172321, 4.816643094804709, 4.817217227469991, 4.817301925643645, 4.817553603451708, 4.817889626668437, 4.818083654147408, 4.818556330912142, 4.818680083613034, 4.819042795768173, 4.819224706013595, 4.819224706013595, 4.8193612476924335, 4.819507596400037, 4.820398244073394, 4.820430692442106, 4.821104787754648, 4.821974849679588, 4.822419620098778, 4.822651797672046, 4.82301840560700815, 4.823277341108756, 4.82371817029921, 4.82371817029921, 4.823835278404429, 4.823906723302213, 4.82432634485812, 4.824468592326423, 4.825416156423752, 4.825635827541557, 4.825824663168078, 4.827689952692787, 4.828071027011654, 4.828203993584854, 4.82868936877876, 4.828829418232781, 4.828829418232781, 4.8288609924264465, 4.829071173458583, 4.829504351555415, 4.829530852620478, 4.830014172117989, 4.8304914794120455, 4.830691480298381, 4.830819568150987, 4.830869678875074, 4.831460125830117, 4.832164268460316, 4.832190590607417, 4.832285457176477, 4.832599701629609, 4.832682625259774, 4.8332158253792645, 4.833672697876545, 4.833885564422008, 4.833921248290278, 4.834234578685138, 4.835355897488159, 4.835504395664066, 4.836064976792475, 4.836064976792475, 4.83638121005663, 4.8364132271147415, 4.836426412990779, 4.836495237660901, 4.836665043679882, 4.836699377289247, 4.836684096864385, 4.83757820031345, 4.8376165711658885, 4.838122651578414, 4.838185407298022, 4.838185407298022, 4.838614275885701, 4.839303614639301, 4.83942737098659, 4.839794955759484, 4.840313455492404, 4.840427755565571, 4.840427755565571, 4.84063306554223, 4.841236691028907, 4.841537353597477, 4.841681487674418, 4.841758775598897, 4.842007209903501, 4.842075792334937, 4.842146400468545, 4.842767011563065, 4.842767011563065, 4.843927713577377, 4.8440252381746385, 4.844245289840414, 4.84457298521588, 4.844686776362141, 4.844686776362141, 4.844749209429225, 4.844977570110578, 4.845007925126222, 4.845143225918255, 4.845349233438832, 4.845912865005733, 4.846542000774783, 4.846926903917777, 4.847385405272468, 4.84745191463421, 4.847803927587389, 4.84806659201193, 4.848396118933785, 4.8494140736548985, 4.8494140736548985, 4.849590940679501, 4.849590940679501, 4.851206418072457, 4.8512512962884555, 4.851831443900464, 4.85201204199588, 4.852039099078, 4.8526952359777145, 4.8526966248073835, 4.852791636903499, 4.852807417565943, 4.853270265374959, 4.853906544604002, 4.854473870183702, 4.854586593466896, 4.854612722706272, 4.854873444634504, 4.854889956098819, 4.855802473520814, 4.85587000505116, 4.85587000505116, 4.85612017702899, 4.857377901706072, 4.857704852660284, 4.85799658187861, 4.8583935038915715, 4.858452351773637, 4.858988427834868, 4.859477547076737, 4.859542229759252, 4.859639351372206, 4.859669808941208, 4.859845043403289, 4.859845043403289, 4.860008045875752, 4.860142660665341, 4.860380773538051, 4.860479548252657, 4.860596237437151, 4.860786915849228, 4.860932435428786, 4.861042884739013, 4.861158662851768, 4.861404637578764, 4.861480697034593, 4.862033479430632, 4.8625106289871205, 4.863053460348879, 4.863418923442863, 4.863437478655082, 4.863670272249893, 4.863670272249893, 4.863918227950978, 4.864458127452923, 4.865021971920762, 4.865275405035533, 4.865292036876877, 4.8653776653709055, 4.8656850157787135, 4.865765272480189, 4.866075488506231, 4.866265289340317, 4.866453343969282, 4.867039824326089, 4.867218747924685, 4.867391582809427, 4.867702348410687, 4.867702348410687, 4.868043482752924, 4.868543177529462, 4.868572767844665, 4.8691665246341, 4.869587968525237, 4.869587968525237, 4.869883679137798, 4.87049592072228, 4.870533106105216, 4.870664921640435, 4.8710319027819065, 4.871663751552607, 4.871809500194185, 4.871850793856051, 4.8724016081129795, 4.8726467933047175, 4.87311077273823, 4.873366025749193, 4.874680004565425, 4.875245493872967, 4.877080012429499, 4.877429925487884, 4.877831817158981, 4.878487608627967, 4.878599831323285, 4.87880082996363, 4.879901847194547, 4.882156420363023, 4.882654982069341, 4.886177209988137, 4.887291569202248, 4.88884870450698, 4.889710876478988, 4.890088401899273, 4.891241740223598, 4.891614700270587, 4.8932865994282375, 4.89530265021106, 4.89543114846241, 4.895715997558376, 4.895715997558376, 4.895827980319984, 4.897873336554317, 4.898194931777841, 4.90121968726129, 4.902128036625748, 4.902219328803282, 4.904201138252262, 4.904517

52458526, 4.90549049884294, 4.905598951982327, 4.9057361674313436, 4.9058921583207455, 4.906094170035321, 4.90678869705926, 4.908677266793565, 4.908815335627283, 4.9090031134424414, 4.9090319523092845, 4.9090319523092845, 4.909934717761293, 4.910544853329271, 4.911185487436703, 4.911370844406714, 4.911734255024865, 4.912101466172004, 4.912506120911574, 4.913068071332354, 4.914182056539486, 4.916102040289306, 4.916182171203547, 4.916183215515875, 4.916352605862076, 4.91639252712155, 4.916558859083633, 4.91672955589299, 4.917549187515993, 4.917962006668376, 4.91876969745917, 4.92002414284308, 4.921826993353085, 4.921959369998157, 4.9219961050769125, 4.922038782016889, 4.922752911201776, 4.922815790106624, 4.923301244903022, 4.923666977452061, 4.924179186891254, 4.924198436741799, 4.924701222522081, 4.924701222522081, 4.924705981742698, 4.924811573565053, 4.925289908100759, 4.925396620007508, 4.92559228937345, 4.925790074187347, 4.926652111135266, 4.926773463542844, 4.926773463542844, 4.926991519050839, 4.927314132665456, 4.92806894228683, 4.928175621651603, 4.928309020692667, 4.9291188633626275, 4.929208247534248, 4.9296620568608125, 4.930233099436119, 4.930387416641023, 4.930845767942105, 4.931007135383575, 4.931007135383575, 4.931490266721491, 4.9314948226001345, 4.931511103072833, 4.931715686115626, 4.931715686115626, 4.932679610942722, 4.933035576122714, 4.933288199354232, 4.933682472082312, 4.933803518523306, 4.9339522513155165, 4.934173498717411, 4.934254341611465, 4.935374049160024, 4.935427898165249, 4.936160297631299, 4.936518464864857, 4.936518464864857, 4.93660207699211, 4.93660207699211, 4.9366779165038235, 4.936868225002382, 4.937181053835014, 4.937412036387121, 4.938272695801961, 4.938866293768373, 4.939633781378571, 4.939817178430765, 4.940334488522884, 4.940334488522884, 4.941418277502081, 4.941505558415207, 4.942011441152768, 4.942218259166181, 4.942641095400827, 4.942654497753733, 4.943577655612822, 4.943927993356328, 4.944912447098863, 4.945452350586077, 4.945461489619754, 4.945626881285563, 4.945676192029591, 4.946413145651612, 4.946494090986299, 4.947091516458699, 4.94715589192981, 4.947207347528805, 4.947517733074626, 4.947900353092486, 4.948423951683687, 4.948577303565176, 4.948902811405733, 4.948918547932193, 4.948954721165158, 4.949329711068008, 4.949398612515149, 4.9495007421994535, 4.949566178426382, 4.949597422834813, 4.949988370785926, 4.950014725118566, 4.950558548840542, 4.950753247599968, 4.951245497717509, 4.951355212055854, 4.951385820483911, 4.951687668679401, 4.9520272557450244, 4.952934674003974, 4.953279273251907, 4.953669764384906, 4.953726530413779, 4.953801865262758, 4.953806148363403, 4.954113005939836, 4.954427892461119, 4.954840385719052, 4.954840385719052, 4.955132794024361, 4.955336975024031, 4.955638862479485, 4.955638862479485, 4.956988446993185, 4.957427074425703, 4.957537417529433, 4.957897037385741, 4.958036996524794, 4.958810987332845, 4.958875204950418, 4.9591404271158295, 4.959271112873459, 4.959567656473443, 4.959853433898575, 4.960308670516854, 4.960663471745514, 4.960750332303962, 4.9608041305418835, 4.961010419906607, 4.9613318601345275, 4.961531889386217, 4.96156686808321, 4.9617068900887915, 4.962243207758837, 4.962661766021906, 4.962773599676451, 4.963033253940321, 4.963127424675313, 4.963649366206494, 4.963653154592163, 4.963865573595564, 4.963895776182958, 4.963954701924617, 4.964034262017848, 4.964074117514623, 4.964225290886892, 4.96432929838767, 4.96442233188305, 4.964489998421392, 4.964592043068856, 4.964762385603403, 4.964762385603403, 4.965016887747925, 4.965056085363719, 4.96663330123382, 4.967012634569889, 4.967408485523835, 4.967526454302403, 4.967751734899054, 4.96779588901817, 4.967825473929773, 4.9797400901857, 4.968313140733089, 4.968377945612885, 4.968642508827061, 4.969066533631819, 4.969066533631819, 4.969561205740548, 4.969571641617261, 4.9699052563363155, 4.97008731013221, 4.970142271785009, 4.970142271785009, 4.970568456445652, 4.971423638789393, 4.9714958853880455, 4.9721104067961335, 4.9725904954337095, 4.973047874717529, 4.973047874717529, 4.973052829226087, 4.976105771394049, 4.976236599735552, 4.976303571476943, 4.976968795878848, 4.977432566850129, 4.977727738137384, 4.979973481007053, 4.978904894324069, 4.978978105684317, 4.97983253160515795, 4.981802649048, 4.983156371344386, 4.983462190758571, 4.987056253991788, 4.988121143386361, 4.9882223693580645, 4.988530905003069, 4.99125359627998, 4.992418264103844, 4.9924228256016665, 4.9924228256016665, 4.9943121846828245, 4.994338785595339, 4.995545929074562, 4.995822402458733, 4.998932177341869, 4.999449337206216, 5.000017277514908, 5.000768675491105, 5.000960708233748, 5.002372248576353, 5.003764412175074, 5.004201236940643, 5.00441365956531, 5.005974203513752, 5.00765213504, 5.008037567195476, 5.009316572412573, 5.010788386972327, 5.011455627971069, 5.011878545357936, 5.012602275597651, 5.0127196856210645, 5.012891486155037, 5.013180922077662, 5.01338705107771, 5.013634355580568, 5.015300002791045, 5.016646908650141, 5.016835991182112, 5.0171357877058025, 5.018779385411805, 5.020288147914654, 5.02047165763474, 5.021174519278321, 5.021174519278321, 5.022966949046761, 5.024674728945705, 5.0247977571488, 5.02530364238593, 5.02530364238593, 5.025449266606711, 5.025449266606711, 5.026082167789866, 5.0268397798623745, 5.027224180722784, 5.0277855868517, 5.028451487187917, 5.028783750024484, 5.028819146499091, 5.029250653885103, 5.029708400673011, 5.0299992891814815, 5.0305091214932265, 5.032274281311137, 5.032730966121896, 5.032929637118593, 5.033562182978162, 5.034320095957258, 5.034694428004757, 5.035086374287302, 5.035086886192791, 5.0355359082529985, 5.036127560921731, 5.0371170335000395, 5.037611007354056, 5.037949204536934, 5.038081952241634, 5.038274915640811, 5.038274915640811, 5.038314

362980272, 5.038609876204807, 5.038629099573578, 5.038629099573578, 5.038818201589802, 5.0388804904368065, 5.038892232388684, 5.039156630069884, 5.039235657734888, 5.039540613140063, 5.039584239972883, 5.0396451849076795, 5.040137810966972, 5.04027090319464, 5.04027090319464, 5.040318526469521, 5.041470947761498, 5.042529450074168, 5.042930846392815, 5.043759221766866, 5.043837605890185, 5.043983611630421, 5.044325408189255, 5.044325408189255, 5.04479609574932, 5.044811906347018, 5.045003268731417, 5.0451033034648205, 5.0451033034648205, 5.045113446013757, 5.045408809207393, 5.045727339065331, 5.046000402669444, 5.046508740380539, 5.04684322580863, 5.046843282934715, 5.046874908108224, 5.046892831054449, 5.047177473737285, 5.047252201110259, 5.0483108934710454, 5.048447675855848, 5.049412028709681, 5.049743950506048, 5.051561427412917, 5.051561427412917, 5.0520394647114975, 5.052054212652928, 5.052460255781066, 5.052508278106896, 5.052657419230936, 5.05267794271811, 5.052745874336259, 5.052745874336259, 5.0529432830251935, 5.0529432830251935, 5.053184892331938, 5.0533326823003195, 5.0533326823003195, 5.054113356197394, 5.054131026201174, 5.054238538121232, 5.054984744845412, 5.055284004157608, 5.055305097674997, 5.055323285459109, 5.055323285459109, 5.055422543442243, 5.0554436775142015, 5.0554436775142015, 5.055465398104214, 5.055754108195358, 5.056816603462498, 5.056910099266932, 5.056996163463637, 5.057224199101881, 5.0574822686096335, 5.057832961004479, 5.058360576205907, 5.058974748253531, 5.059106094422891, 5.059331281623992, 5.059759446066288, 5.0597879611684995, 5.059986358684742, 5.061835855259949, 5.061975309288756, 5.0620871014229545, 5.062224630753492, 5.062243450464457, 5.062321736898642, 5.062472869421116, 5.062566131409553, 5.062582387211532, 5.062832849196639, 5.062858536592812, 5.062972212921103, 5.063267194855918, 5.063532158603675, 5.0639507360438234, 5.0648926946695205, 5.065082921574403, 5.065548054990063, 5.065834400246878, 5.0658729396415305, 5.066579976937521, 5.066731368315973, 5.067027543951776, 5.067068726417969, 5.067725446263727, 5.067746084954336, 5.067746084954336, 5.0685945634764, 5.068659290884747, 5.068730338056008, 5.069363661205106, 5.069543606289199, 5.0704308363991215, 5.070704972010744, 5.0707049720107044, 5.071184341871539, 5.071547869875117, 5.071938801296387, 5.072812383643642, 5.073117852453256, 5.07462528657097, 5.075198161400945, 5.077288722042073, 5.077487797131479, 5.079057947345584, 5.080450266928757, 5.081743205311791, 5.08196714577305, 5.083506104976527, 5.084623255492541, 5.085046186677776, 5.08601253540295, 5.093401938745429, 5.0960022528438484, 5.097032125677888, 5.097656274862812, 5.099452806849992, 5.099452806849992, 5.100795206806046, 5.100795206806046, 5.10237657648406, 5.104237695205452, 5.106365582899959, 5.108271386535777, 5.109010282753713, 5.110252288697589, 5.113514727316449, 5.1136183291681645, 5.1151440326263256, 5.1151679973990218, 5.115245233786177, 5.115767083188044, 5.11608957744169, 5.118169281125998, 5.118529779504727, 5.118973644973579, 5.119265766845087, 5.120368469783451, 5.1222130157056585, 5.1222697977981, 5.123161321089652, 5.123161321089652, 5.124221382531893, 5.124382950435564, 5.124495613228587, 5.124905074646792, 5.125150968072963, 5.127900857451504, 5.127935149795052, 5.130060365187641, 5.130127621707881, 5.130269375003161, 5.130269375003161, 5.1308668629643295, 5.131008156756815, 5.131942019287582, 5.132106800659636, 5.132362550845835, 5.133623357730451, 5.133726251106285, 5.135101615962541, 5.135128845748407, 5.137378190796225, 5.137378190796225, 5.13738180705622, 5.13747225228759, 5.137476997348956, 5.137837949674269, 5.139031218037361, 5.13996239522413, 5.1403172698267525, 5.140806388476138, 5.140846711809889, 5.141592474499193, 5.141628391998898, 5.141628391998898, 5.14237992573721205, 5.1438941330452685, 5.144477788549884, 5.144803210539328, 5.145598788368136, 5.1458805492676865, 5.1458805492676865, 5.146222727623634, 5.14670385254946, 5.146711531049313, 5.1468675231031416, 5.147386898998762, 5.147570620436385, 5.147733721863999, 5.149462515332462, 5.149999358609564, 5.150797143797718, 5.150895270034543, 5.152020575835388, 5.152165959959621, 5.152258727391423, 5.153309979361374, 5.153976726924441, 5.15430170262749, 5.1543177497649335, 5.154565386991715, 5.155240174509799, 5.155588640814868, 5.155713380972296, 5.156004376036273, 5.156083267715987, 5.1561566888353605, 5.157513734664151, 5.157918395793767, 5.158844107384392, 5.158881408645429, 5.159452193611079, 5.1601362855147235, 5.1606342890960155, 5.160976365184237, 5.161339452022861, 5.161783030810948, 5.16200917651402, 5.162106136777478, 5.162208345735364, 5.162243566039999, 5.1623316468464955, 5.163706081627808, 5.163944868999462, 5.164102944618767, 5.16421000690475, 5.16421000690475, 5.164648765019209, 5.16474868176232, 5.164864637910566, 5.165168350799041, 5.165247112031292, 5.165824180496403, 5.166569960279349, 5.166904703781191, 5.166978528438961, 5.167436532981596, 5.170695227525885, 5.1707898401874, 5.171583982295184, 5.173290317860573, 5.174808392920075, 5.177549462051294, 5.179194368295302, 5.179194368295302, 5.181147679827655, 5.184191809860411, 5.185686606963797, 5.187111672232643, 5.187177455621824, 5.187934855275701, 5.188037369505318, 5.190800177129124, 5.190813864864518, 5.190957673323461, 5.192875619888197, 5.192962919638651, 5.194416225143739, 5.194773418951528, 5.194773418951528, 5.1986264351021685, 5.19874617296645, 5.200417782284678, 5.201267530197442, 5.2031889296506595, 5.2031889296506595, 5.203453255804621, 5.205816372566931, 5.205816372566931, 5.2074781930010605, 5.2074781930010605, 5.2077583205075015, 5.2077583205075015, 5.2086697441748, 5.208682228162245, 5.210590481158228, 5.211168783837734, 5.211168783837734, 5.212084791895285, 5.21260970921221, 5.213242190

7124815, 5.215773917409112, 5.216507671075643, 5.216507671075643, 5.216620791977472, 5.217433293257658, 5.217775552254282, 5.2178891719832965, 5.218535822640949, 5.219132168667711, 5.219150323997673, 5.219204834118697, 5.219241144367885, 5.219879250662731, 5.220052313918307, 5.220312335601744, 5.220728336790325, 5.221319100484236, 5.2213994508120685, 5.221546371670579, 5.222036181581125, 5.222036181581125, 5.222803952844633, 5.224313778130632, 5.225045286539584, 5.2254084021888785, 5.227263971644039, 5.229092880492679, 5.22942845294734, 5.22942845294734, 5.231617081882781, 5.231753665823929, 5.232220687920105, 5.2331283343876525, 5.233422744359038, 5.233422744359038, 5.233747629202731, 5.234103241065475, 5.234972465378837, 5.235028147315288, 5.235208416190769, 5.235208416190769, 5.235556712246352, 5.236116695238468, 5.236913448958441, 5.237936998536368, 5.238062176027219, 5.239449404766084, 5.239611584080026, 5.239700114957246, 5.240701691787175, 5.2410209980860305, 5.2410209980860305, 5.241581812845331, 5.242254974913891, 5.242555380336916, 5.242642005244956, 5.2428093519370735, 5.243245853434169, 5.243874113120819, 5.244044481915819, 5.244410776809928, 5.24457730168115, 5.244757884993095, 5.245082388133165, 5.245130035203965, 5.245367235934911, 5.245712212756958, 5.245742318784121, 5.245742318784121, 5.246028791428231, 5.246089085923276, 5.246430195548368, 5.246673902405533, 5.246886203330262, 5.246896004994776, 5.247129678890058, 5.247994443352062, 5.24820285952862, 5.2482771333401566, 5.248823042466892, 5.248845481189686, 5.249034570609287, 5.249347649913784, 5.249347649913784, 5.2494963080785, 5.249771532219568, 5.250717846007569, 5.250882168633075, 5.251250577131897, 5.251955807790507, 5.252157375459798, 5.252522023661605, 5.25302542107503, 5.253365891374413, 5.253669040050973, 5.253679766781412, 5.2536801552413115, 5.254123633828976, 5.254275821271504, 5.254728334245542, 5.255062922350217, 5.255682125236542, 5.255766083964784, 5.25594273831513, 5.255962397007947, 5.256008323415189, 5.256483479473399, 5.256650085610727, 5.25673235564648, 5.257047628078493, 5.2581191988923175, 5.258161649838291, 5.259312663376619, 5.25984084446148, 5.2598410439056185, 5.260066865917574, 5.260071347812371, 5.2605588532513625, 5.261160063785409, 5.261799253326543, 5.261799253326543, 5.262891408645075, 5.262968170701003, 5.263523718300234, 5.2639729626123595, 5.264285072568274, 5.265003378067802, 5.265355409489924, 5.265790187147824, 5.2664377598539165, 5.267505495432661, 5.268093630639784, 5.2680999707089997, 5.2682221651871535, 5.269846564970638, 5.2710492638767255, 5.2733342994132775, 5.274868660406162, 5.276399921333829, 5.284361558844108, 5.28441252045923, 5.288615834238918, 5.290007409712723, 5.290007409712723, 5.291244814130841, 5.291244814130841, 5.291415420235116, 5.291470924552074, 5.293089188671305, 5.293540010250566, 5.293576651984345, 5.294865491179429, 5.296143617460801, 5.296193123839977, 5.296611324944863, 5.296888396199585, 5.297873312982654, 5.301184299780242, 5.30142570926805150, 5.3014257092680515, 5.301933066871404, 5.302444935537453, 5.303449374504616, 5.30394790111371, 5.304152037870837, 5.30436920378017, 5.305144526793155, 5.306238051876385, 5.307385623007788, 5.307385623007788, 5.308467734680956, 5.308737344666257, 5.309396545787859, 5.310163016985636, 5.310163016985636, 5.312566989640559, 5.312628442758938, 5.313001145075026, 5.314371798443323, 5.314832263039444, 5.316112291048635, 5.317565417119543, 5.317791600716342, 5.318347299483895, 5.3186246966383095, 5.319814357063052, 5.319930743568342, 5.320306990798861, 5.320469848510761, 5.322094576817235, 5.3227427294941805, 5.3232937867177785, 5.3232937867177785, 5.323472484664408, 5.324152955197136, 5.3242430559238665, 5.324553391229878, 5.327105921970061, 5.327376518056714, 5.327454584194333, 5.327670032999406, 5.327815315652664, 5.327875843621047, 5.328061620055297, 5.328094869273919, 5.328619030659642, 5.328903496358526, 5.3289392208179445, 5.330251475505624, 5.33057740589022, 5.330752288168028, 5.331032060758813, 5.331845217772387, 5.333178980556387, 5.333178980556387, 5.333336679800466, 5.333502516942888, 5.333699983753781, 5.3339412888393, 5.334590992857891, 5.334590992857891, 5.334819238412215, 5.334870274330152, 5.335189818192864, 5.335216681103369, 5.336470729469587, 5.336676220191196, 5.336712753984417, 5.336970428340732, 5.337200932999485, 5.33750454385919, 5.3376386164973795, 5.337708650814121, 5.337807021516776, 5.337923361629249, 5.3381149577638105, 5.33824658334262, 5.338671111246234, 5.339417137022512, 5.3398997098138636, 5.340326403073844, 5.3409073928741195, 5.341078121501566, 5.341468505535388, 5.34189308050736, 5.342437041796633, 5.342581519441566, 5.342595878600593, 5.3436300582213, 5.343933313459856, 5.345288515310395, 5.345738490117554, 5.347040069886549, 5.347059881587348, 5.3472369227667205, 5.3475747046148, 5.347684659787093, 5.347991473859163, 5.34800111393542, 5.3480115520821965, 5.348093507499413, 5.348127935977216, 5.348237672615921, 5.3491928468682, 5.349353698220699, 5.349810550424576, 5.349874549182117, 5.350385955230714, 5.350704774398453, 5.351372086508176, 5.351372086508176, 5.351778211708886, 5.351778211708886, 5.351882023788557, 5.352535658226526, 5.352535658226526, 5.352559763150784, 5.352953229404296, 5.354270688865749, 5.354697918698209, 5.355067789812018, 5.35518460315224, 5.356801312549116, 5.35684250804952, 5.356883221681753, 5.357055259779949, 5.357235416935976, 5.35737271562939, 5.357944844155422, 5.3580471300079715, 5.358108638320793, 5.358119489491735, 5.359084145462193, 5.359606177468695, 5.3600454651839895, 5.360709225842769, 5.360876136524844, 5.361847761813136, 5.362213337629036, 5.363266899186028, 5.363330289485364, 5.364936134427603, 5.365348244718232, 5.366940752784285, 5.367194055367646, 5.3679463593781005, 5.368128

7856183255, 5.371095527183413, 5.374528667681765, 5.375912213142873, 5.385892645106537, 5.3865151069761925, 5.386770579368247, 5.3880465255705, 5.388893162794008, 5.389069634309315, 5.389352634759928, 5.390302314072605, 5.390888384697227, 5.390888384697227, 5.391818662649446, 5.39212646372893, 5.3922367142590675, 5.392692867493255, 5.3929655253518, 5.393842730935361, 5.394712045725303, 5.394745206662975, 5.396012877152148, 5.396061677047481, 5.3964018030991205, 5.396683357274674, 5.401439293636385, 5.40227847453144, 5.402827670627336, 5.405294733283922, 5.4061990496942345, 5.406827194666166, 5.407485447079513, 5.407784139827952, 5.407829067169739, 5.4094627751122815, 5.4102316863903175, 5.411713014609892, 5.412280735202129, 5.4135033052649, 5.413900674476726, 5.414016028440098, 5.414164300644593, 5.414545959689734, 5.415169510568647, 5.415860137082935, 5.415860137082935, 5.415942495564687, 5.417510862983264, 5.417587820415718, 5.4179268902983155, 5.418235441606047, 5.418595310735031, 5.419623365868169, 5.419682756113315, 5.41982891731751, 5.420254006421626, 5.420452550650731, 5.420705782923155, 5.420705782923155, 5.420961495494055, 5.421762686197357, 5.421926061304507, 5.422100978403128, 5.422327103644275, 5.422414146975737, 5.422414146975737, 5.422993784043137, 5.423146800847036, 5.423788485606275, 5.42507139787796, 5.425449996420338, 5.427515945896039, 5.427515945896039, 5.429783961433905, 5.4303333520590815, 5.43208449342685, 5.432501749406468, 5.432651759830208, 5.433072223767683, 5.435037516382834, 5.4351119790459625, 5.436487265014855, 5.436744755853294, 5.436834554317929, 5.437628720195056, 5.437969964174897, 5.438701501953379, 5.440253896060963, 5.440464538476111, 5.441114697028814, 5.441114697028814, 5.441192726895814, 5.4420828694977805, 5.442334188744647, 5.442334188744647, 5.442776325536272, 5.442791473601594, 5.4433190192471255, 5.444478447207311, 5.4449916788897585, 5.445291047850759, 5.445891164667112, 5.446084776506826, 5.449118807670803, 5.449152409444708, 5.449152409444708, 5.449603085477655, 5.450108594286809, 5.4509539393872, 5.451340700272976, 5.451422619075417, 5.451777672533794, 5.4529351684595975, 5.4535824077924255, 5.45374948260121, 5.454000409844943, 5.454898369682702, 5.454898369682702, 5.456137280763418, 5.4578980950215, 5.460917848121207, 5.460927038435829, 5.462000668355942, 5.470427551849398, 5.47059795031644, 5.471337953991051, 5.4736047468079025, 5.473904041405779, 5.474424819999176, 5.474424819999176, 5.476204487880914, 5.476204487880914, 5.477533398237008, 5.477533398237008, 5.483939552356398, 5.485481802750964, 5.4865330748798575, 5.487595844010728, 5.490128571637832, 5.490582252506778, 5.494332354600316, 5.495372064228165, 5.496340149718364, 5.496911262965624, 5.497628898157469, 5.498071820400463, 5.498093904649454, 5.500403731645861, 5.5005074053471885, 5.500641462784665, 5.501485183659509, 5.502348184249025, 5.50260318593652, 5.503017061559257, 5.505115304025226, 5.5057115545914295, 5.50707455968584, 5.507893041953206, 5.508791360943438, 5.50881503771996, 5.5103192423634715, 5.510840162654748, 5.5114885518060035, 5.511936229126082, 5.511997946760431, 5.512279710566635, 5.51270456361057, 5.514595799930892, 5.515402801100413, 5.515618416188083, 5.516256496273183, 5.516372357154515, 5.518096710244662, 5.519579713784713, 5.520474897726891, 5.520474897726891, 5.520742177199247, 5.521959157507282, 5.52215021794479, 5.52236761771291, 5.523306425988265, 5.523464629681566, 5.523873486045769, 5.524745274550441, 5.525287197358547, 5.525324441642982, 5.525345475964347, 5.526008118798595, 5.526121901906523, 5.527083453417448, 5.5273568036133875, 5.52823592225044, 5.528704546028032, 5.5290980039793505, 5.529166589795478, 5.529166589795478, 5.529534997391393, 5.530863015760787, 5.531395103055755, 5.533380926064153, 5.533443704649479, 5.53360986631709, 5.534155498955135, 5.534248661357844, 5.534979701198498, 5.535454658714837, 5.535669537888067, 5.535683433232563, 5.535826587557144, 5.536024782593407, 5.536108594076417, 5.5363179660541775, 5.537130642133553, 5.537423330961606, 5.538319358156846, 5.538592871952184, 5.538592871952184, 5.538675050116758, 5.53872295704589, 5.539451955609457, 5.540108706078603, 5.540620289420966, 5.540873589565877, 5.540873589565877, 5.540990416087657, 5.540990416087657, 5.541178261279451, 5.541929229954515, 5.542965320084463, 5.54472356070134, 5.54554989070944, 5.55281916703575, 5.554079840741152, 5.556525665339875, 5.556591814829934, 5.557205828960959, 5.559730028233334, 5.560359468446467, 5.561095602604364, 5.561682408011155, 5.561682408011155, 5.56319740549821, 5.567379528759658, 5.56870696080109, 5.570567465075953, 5.5710429879201655, 5.573492148495338, 5.575849509045233, 5.5760700222747435, 5.57725582723663, 5.580445355788498, 5.581693997699404, 5.581748340654356, 5.582647879831815, 5.582740902924883, 5.583232832432366, 5.583307966881172, 5.58478639480081, 5.586934792836924, 5.587686248197732, 5.588449964572027, 5.588449964572027, 5.589213882603136, 5.590228039759096, 5.593862541578525, 5.595431150397333, 5.596038287898542, 5.5965281472693755, 5.597085577442642, 5.597827115513094, 5.598154443302339, 5.599304255163929, 5.599507356648109, 5.599507356648109, 5.6013504858054395, 5.60436310122919, 5.605376138374056, 5.605587057449484, 5.606415054973912, 5.606903314048465, 5.606948022202259, 5.607392351650729, 5.60907857925919, 5.609750259919039, 5.610261092938942, 5.610261092938942, 5.611781597999407, 5.611883386990946, 5.612289402071378, 5.612438620565945, 5.612513548785649, 5.613434406343, 5.613536057356655, 5.613536057356655, 5.613894252425302, 5.614647077868309, 5.615457267309022, 5.615694089802572, 5.6158278533634975, 5.616256406496281, 5.616872536247502, 5.617871907377656, 5.617914208587159, 5.617974395689579, 5.61837070458181, 5.6186894139694745, 5.618859465736119,

5.6189812536402854, 5.619171360598582, 5.619171360598582, 5.6203161979729614, 5.620626588825619, 5.621655641114324, 5.62288885
6584266, 5.623071276212904, 5.623325172512534, 5.623545802433678, 5.624284704553919, 5.6243253893811005, 5.625554876430439, 5.6
25728233580785, 5.625728233580785, 5.62574696521999, 5.625982842815967, 5.6273241765794495, 5.627502243366536, 5.62761920368234
3, 5.628559036625965, 5.629097442114795, 5.631366525248388, 5.631733870544408, 5.6352854855268335, 5.63589293852658, 5.63645745
2274637, 5.636458631216167, 5.637959406413526, 5.638208756424786, 5.642140616418847, 5.6423839786125765, 5.646293016093976, 5.6
47449856609663, 5.650066099190977, 5.6526958486095165, 5.654885124823739, 5.655833598848346, 5.65590597043185, 5.65765347704526
44, 5.658613091338127, 5.659685367604476, 5.660096632130656, 5.660265483762219, 5.6634955503891256, 5.666443299734896, 5.667071
430331731, 5.667144103442044, 5.670166652328809, 5.671039200518751, 5.671217045789816, 5.671217045789816, 5.672719018787242, 5.
672957007873504, 5.672957007873504, 5.6762385089242535, 5.677957577667871, 5.678902806482795, 5.679808851948982, 5.679810023649
816, 5.679926084621703, 5.6805509041716835, 5.681811407421138, 5.681811407421138, 5.682112132306366, 5.682492191336391, 5.68303
4029468567, 5.683482920041396, 5.684282656436416, 5.684355940133046, 5.684355940133046, 5.684713015689319, 5.686826005503722,
5.686895187453264, 5.687489772080562, 5.687489772080562, 5.688175740291291, 5.690799108250081, 5.690811365962673, 5.6914829678
44021, 5.691625107655603, 5.6935852097053905, 5.6945260464060805, 5.694693228560197, 5.694962088372148, 5.695287649173238, 5.69
5287649173238, 5.6957492021441976, 5.696237517462258, 5.6964520587250105, 5.698046531341173, 5.698219046385877, 5.6984414123175
275, 5.698962301615128, 5.6996929440841155, 5.699872879538959, 5.700241080003865, 5.700766619340478, 5.702177433635183, 5.70292
6038148146, 5.703698020997621, 5.704218437313681, 5.704441570283398, 5.704705193782139, 5.704831493817157, 5.704848786061255,
5.7054376916361615, 5.705505184772279, 5.706444745075709, 5.706817834416316, 5.707465801211146, 5.707465801211146, 5.707974310
2985185, 5.708443279795707, 5.70895018735, 5.709316822046568, 5.710784020019137, 5.711234040906015, 5.711252733075806, 5.711560
542125674, 5.711633883210736, 5.711839837086687, 5.711839837086687, 5.712021197289006, 5.713753663019711, 5.71410517919679, 5.7
1410517919679, 5.714407523959012, 5.714654094319888, 5.714684477315948, 5.715330814749625, 5.715771270196549, 5.71598872694616
3, 5.716420323488521, 5.7168768055341985, 5.7176355015680755, 5.717941365879858, 5.7183035037647265, 5.718709924039962, 5.71903
3008162696, 5.719035000643867, 5.719152416509669, 5.720208120167403, 5.7204918992951885, 5.720700732690099, 5.720700732690099,
5.722058038144788, 5.722430416519667, 5.722909975794778, 5.723130341034899, 5.723321960840797, 5.725283172660497, 5.7252831726
60497, 5.727940667269632, 5.729632457064826, 5.731733750258564, 5.732835339234829, 5.73327347938214, 5.735289111292735, 5.73731
1544101619, 5.7383770588772771, 5.738579211483536, 5.741516851867824, 5.746470399899294, 5.746599965552844, 5.751349845110511,
5.751349845110511, 5.752422449181535, 5.752762441399994, 5.752929668231665, 5.753514327212126, 5.753671682183591, 5.7542033888
42778, 5.755993828187035, 5.757009711721757, 5.757070207230213, 5.758516775388261, 5.758639723383963, 5.760198714390281, 5.7623
64692681922, 5.763647196513357, 5.763647196513357, 5.763695226098116, 5.76397488189064, 5.764361644479576, 5.765712556934552,
5.766491322262417, 5.676671810625973, 5.768960470229222, 5.769979726379499, 5.77044671485186, 5.770686261722366, 5.77244043067
813, 5.774495378661926, 5.774495378661926, 5.774635789222785, 5.775803898092792, 5.777524556965975, 5.778565810445857, 5.779007
141753686, 5.7798668616559175, 5.779870772107883, 5.781380593362642, 5.781596648435413, 5.781896952312437, 5.782140799922043,
5.782611668009735, 5.78274373684087, 5.78383449535129, 5.785071491967545, 5.785080451955746, 5.785543718753106, 5.785593317952
817, 5.787767799238109, 5.788364159677599, 5.788666293447323, 5.788935861052686, 5.7891236403203505, 5.789397158636201, 5.78963
4719848465, 5.790152606593368, 5.790826995349405, 5.791078913917302, 5.791337980064505, 5.792313169938541, 5.792624876281793,
5.7944054480145635, 5.794793031909478, 5.7951202958697445, 5.796661070332925, 5.796862570352661, 5.797471755926679, 5.79763240
7789119, 5.797946367426405, 5.799196431333289, 5.799334610418127, 5.800283453207047, 5.80039089193585, 5.800454534802494, 5.800
771563265667, 5.8034444798568945, 5.80374456034234246, 5.8037445603423246, 5.803816210390089, 5.8038902236822345, 5.804080763332
926, 5.8055770073675974, 5.8055770073675974, 5.808162453407219, 5.80895549601447, 5.814286829700684, 5.817076338716347, 5.8197890
77574882, 5.822121574033062, 5.824131777150012, 5.829035264733184, 5.835337320715397, 5.836840019535147, 5.837794130834021, 5.8
37794130834021, 5.837900704994003, 5.838191361498541, 5.838517717798558, 5.8424394590511195, 5.842829493414388, 5.8432637846434
305, 5.845167906276099, 5.845366523154122, 5.845713001424875, 5.845713001424875, 5.849474768953387, 5.849559186833015, 5.849559
186833015, 5.850134808827089, 5.851496867815024, 5.85220211228073, 5.8534873192079, 5.854686196487183, 5.854993439378775, 5.855
075922326887, 5.8563489056577875, 5.8565030011100925, 5.857689488007826, 5.859264676404208, 5.8604878622162095, 5.8613428776301
49, 5.863086930415286, 5.863900422399359, 5.865553401734136, 5.866585716730749, 5.868001381680806, 5.8689696049722615, 5.870306
185369538, 5.871117576605394, 5.871117576605394, 5.871226778447213, 5.87200345203825, 5.87313089467716, 5.873238125410605, 5.87
3621555675362, 5.87477604040943, 5.875063832372682, 5.8751185821852925, 5.87551228279593, 5.877085211908849, 5.878286730387596,

5.878645195073798, 5.8808559565069425, 5.8815266850839985, 5.88177186165741, 5.883362409351273, 5.884112597075456, 5.884623433214835, 5.884734031729819, 5.884848420663741, 5.884848420663741, 5.8864260624186215, 5.8879367927925905, 5.8879367927925905, 5.888533249470166, 5.888598789958146, 5.88883981353268, 5.8893365881465, 5.89062614238928, 5.890766947581601, 5.890814901673997, 5.890896251300592, 5.891794873987952, 5.892713820603321, 5.892976374742651, 5.892976374742651, 5.893094625385014, 5.89434473404926, 5.89589643459543, 5.896017772977455, 5.8999638749587815, 5.900792788150091, 5.901066097596102, 5.902505989134573, 5.9033181062777516, 5.905336371400846, 5.910862360684379, 5.912271955493073, 5.9130230414796365, 5.9151845060303865, 5.9197784544745735, 5.923453627384957, 5.92371292520041, 5.923869665061304, 5.923869665061304, 5.924002780758797, 5.925816114223191, 5.925816114223191, 5.926499813996071, 5.929788350981299, 5.9299126618839955, 5.935265070685078, 5.936342405168536, 5.9370036080599835, 5.937060149236642, 5.937496922407189, 5.940206092524997, 5.942912817736401, 5.943305923713496, 5.9437424163179875, 5.9437424163179875, 5.944438547965734, 5.945977704371237, 5.946489677893481, 5.946637364767774, 5.947092878566599, 5.947092878566599, 5.948281967083931, 5.948281967083931, 5.948577473470345, 5.948577473470345, 5.949881221694367, 5.949881221694367, 5.950297910932156, 5.951941497292146, 5.954192894857257, 5.954192894857257, 5.9549089023799775, 5.955009050852162, 5.956261984807361, 5.956633371137712, 5.957566890147549, 5.959624338288293, 5.959724123063165, 5.9611942807646585, 5.9611942807646585, 5.962200298236824, 5.962286570686989, 5.962946916329607, 5.963779725709585, 5.964557970294112, 5.964565376783705, 5.965763738706197, 5.966854009749534, 5.968013422196976, 5.96818925529858, 5.96851092426986, 5.969169903035588, 5.972286282701373, 5.972417540834673, 5.972463048148803, 5.9730113003955925, 5.97364198376553, 5.973953543343773, 5.973953703640833, 5.9768023153248135, 5.978049040364837, 5.97806275290013, 5.9799422594211284, 5.982633053359769, 5.985252649201216, 5.985516304693994, 5.992790507797551, 5.998506117801341, 5.998560164933039, 5.998560164933039, 6.000403921245787, 6.002257155955217, 6.003463423500489, 6.004087965047138, 6.0048929205707875, 6.00511093253564, 6.007390847059687, 6.0083395859955715, 6.009324785165195, 6.009324785165195, 6.010178419214291, 6.0111683235040205, 6.013182612142433, 6.013801097641411, 6.017189223564805, 6.017698172358221, 6.020512206215712, 6.020512206215712, 6.022137552510517, 6.023373077565644, 6.023373077565644, 6.024142328863816, 6.024231579693138, 6.024780072193543, 6.0259162001471430, 6.026037047617641, 6.028498742635341, 6.03079898036616, 6.031304783799541, 6.032282090284502, 6.032847466775128, 6.0347573007509485, 6.035233106369129, 6.035692848515966, 6.03573421410573, 6.035889344574597, 6.037283385946471, 6.038900253066293, 6.039774748430049, 6.039830103502311, 6.04256253401754, 6.042591855199794, 6.043783946218182, 6.043812236015928, 6.044024836017969, 6.045384893246353, 6.045675514698274, 6.048140426345252, 6.04842683395467, 6.048943989013149, 6.050070791193353, 6.0501277682307370, 6.05045225306742, 6.050453030439261, 6.050774627442894, 6.050926711621358, 6.051173292343099, 6.05212254949875, 6.052195166760505, 6.052907235343446, 6.05413912625208, 6.05485072288959, 6.055086659854366, 6.055366430690561, 6.055474191685409, 6.055530911466691, 6.055903578273176, 6.058961169564245, 6.059470852716023, 6.0620379873418795, 6.071331825111925, 6.0723493361856535, 6.0768479836350995, 6.077363111176324, 6.078110307583398, 6.083712440493606, 6.086171181859661, 6.093372608774082, 6.093059413940075, 6.0944360902427395, 6.096659490339577, 6.0967326937284305, 6.097151766781255, 6.097629115486208, 6.099901180986929, 6.100527800236284, 6.103901102369845, 6.106442577811418, 6.107837061250744, 6.10850457485031, 6.10850457485031, 6.109157664224072, 6.1104511625188245, 6.1116160386308485, 6.1116160386308485, 6.112042213452771, 6.113997416070622, 6.115209718226309, 6.115402006150024, 6.115827423836269, 6.115873702365848, 6.116008193265193, 6.118702324855287, 6.121437792790431, 6.1219265698862015, 6.1219265698862015, 6.122166803277321, 6.128890483694384, 6.129743246909072, 6.130664170893472, 6.130760111179404, 6.130760111179404, 6.1321606015596535, 6.133656619640628, 6.134649299055141, 6.134811350284739, 6.13569973106175, 6.136779603171749, 6.137476765184437, 6.137786341239034, 6.138730530609347, 6.1399635053108526, 6.14015305414992, 6.140190508979385, 6.141391217503236, 6.141452335246785, 6.141631672778418, 6.142262517779824, 6.1424105203658135, 6.142894655431493, 6.143207645959266, 6.143979688115347, 6.145855994105782, 6.146805499209475, 6.1514562566992534, 6.152680117371341, 6.1528496784668585, 6.15332498855182, 6.1555077622272325, 6.1555077622272325, 6.1573242238388275, 6.1606197580086155, 6.173612294932727, 6.174260599622614, 6.1745610518313425, 6.176406367941661, 6.17968001223516, 6.182287446663988, 6.184075608584529, 6.1856106216825, 6.18801476414791, 6.188373829966015, 6.1891347688846885, 6.193853186389146, 6.194722306341633, 6.196243990154553, 6.197196292352745, 6.198148811099229, 6.199358187271112, 6.1993980950902765, 6.20057873941239, 6.2014879931936555, 6.20178015545533, 6.2033239418988, 6.204072032062079, 6.204626974567852, 6.2061451016749585, 6.206164065023674, 6.206668743855201, 6.207067641911192, 6.207621552591576, 6.208059797574925, 6.208059797574925, 6.208870335782668, 6.209542038370361, 6.211116264810452, 6.213726138513087, 6.214689424542817, 6.214915428095669, 6.215326102436646, 6.21553366877188, 6.216419822964352, 6.220199496367794, 6.220474035577969, 6.2214830383837505, 6.222280336094515, 6.222841849408638, 6.222900618800244, 6.223218293822428, 6.223331530460388, 6.22653309544204, 6.2

269606239341355, 6.23034333300862, 6.237751304125387, 6.238343213207928, 6.238382033494556, 6.23949050343344, 6.241880936751438, 6.241902353545512, 6.241902353545512, 6.246011764705773, 6.2462683721921515, 6.246451668345864, 6.2468430777092685, 6.252867760408555, 6.256536232757652, 6.2589649433121055, 6.259706776317242, 6.25986967443778, 6.263591823582275, 6.26414501866788, 6.265405472843875, 6.265541030779395, 6.265541030779395, 6.266305821270479, 6.268411713251264, 6.268458759075639, 6.270159134005692, 6.271691661591421, 6.2796030238178595, 6.280728014469285, 6.281690129836578, 6.28234796376742, 6.282436242582865, 6.282997647141097, 6.285837245412638, 6.286508834108706, 6.287183990530478, 6.287716104234205, 6.2889774617865895, 6.28967189976439, 6.292562222282099, 6.293436450891782, 6.2939836027900675, 6.295592161827026, 6.298116791107583, 6.298599292409944, 6.298599292409944, 6.299090045422949, 6.300196000697001, 6.302530025629081, 6.3064112888478885, 6.308915336108891, 6.3127456134135285, 6.314419948060463, 6.317319201080287, 6.319949608714353, 6.321699855798195, 6.322829913712629, 6.323124854395091, 6.32424718711069, 6.337532004191614, 6.338577209934403, 6.343318676445856, 6.3439540880615715, 6.3445015131961355, 6.346144536227597, 6.347872382850018, 6.347882618310415, 6.34839529447576, 6.352531573523379, 6.3533559656504925, 6.353951057252089, 6.353967070443316, 6.356640600102099, 6.3578030140884065, 6.360902021433074, 6.360902021433074, 6.36119893954234, 6.362793611309051, 6.363571450232896, 6.364162232620912, 6.364162232620912, 6.364684415946406, 6.3650511303859645, 6.3650511303859645, 6.365213172759303, 6.365683032218155, 6.367126278316621, 6.36972237274554, 6.373341955518762, 6.373350407922447, 6.373680510425851, 6.3741424641723485, 6.374787795930554, 6.375321042096786, 6.377059121470569, 6.377455664532201, 6.377607331060991, 6.38003683297525, 6.3809245107244355, 6.381214990707103, 6.381214990707103, 6.383709209839674, 6.38378826065354, 6.383888719609666, 6.384240626717836, 6.3855991442194115, 6.387592137894809, 6.389791647887388, 6.407646853000891, 6.409346992320915, 6.411360205776772, 6.41138385633956, 6.412481332981937, 6.4128034078355824, 6.41487043199008, 6.421768542989911, 6.422205670037194, 6.423042935760092, 6.424367568799186, 6.426568917561592, 6.428371735281246, 6.430025281516958, 6.43032820793973, 6.43082827893087, 6.432548436947974, 6.434016409935717, 6.435356753778868, 6.437396735234899, 6.4424172470362455, 6.4425446516271245, 6.444230787053789, 6.44539857839775, 6.4460100336033033, 6.448881846131068, 6.448881846131068, 6.44924076318731, 6.4498834880084, 6.4517388155635755, 6.45241822461444, 6.45348187479668, 6.454487519766382, 6.4549353639721, 6.4549353639721, 6.455174253415268, 6.455174253415268, 6.455842506248433, 6.455994998802713, 6.456047153119396, 6.456303481069478, 6.457985866564677, 6.458381381820064, 6.458381381820064, 6.4603796103146545, 6.461517209889338, 6.46301624581459, 6.46301624581459, 6.463682343233275, 6.4679388103113675, 6.4679388103113675, 6.4761460917785065, 6.477411562019634, 6.4785060980146145, 6.479240868385356, 6.479240868385356, 6.479984110770006, 6.480196294761602, 6.483366149612864, 6.48427336878544, 6.484450414213601, 6.484471351517506, 6.4905054440022845, 6.491956910840276, 6.4941457579250965, 6.4942847518576166, 6.495204984716299, 6.496052951043051, 6.496457277729697, 6.498586099297841, 6.5018809685725305, 6.503441457681644, 6.505142947688199, 6.506894354569934, 6.510193282598534, 6.510436485495372, 6.511914485647072, 6.518896303385341, 6.5211561774096145, 6.52211060218639, 6.523602575502491, 6.526871039589089, 6.526875683673772, 6.5268910341413795, 6.528423913297868, 6.530463755670291, 6.532818990454146, 6.534181873433658, 6.53558964718464, 6.535639488654176, 6.536348420003466, 6.536348420003466, 6.536481754740653, 6.539352538788094, 6.542755495476534, 6.542755495476534, 6.542913710119327, 6.543956857336696, 6.54633151675757, 6.551941595103608, 6.552030096999416, 6.552030096999416, 6.552115243072174, 6.553931378029847, 6.5562108804152714, 6.55650842911767, 6.558962306863618, 6.559712434839876, 6.561250347496935, 6.561339439004734, 6.561783739867716, 6.564156725777293, 6.566522631714536, 6.56763392224121, 6.568289850965434, 6.568342241278644, 6.5685493179993975, 6.568687749646105, 6.5687474111198, 6.5721348479068915, 6.572762840151262, 6.574004206497314, 6.5740300776494305, 6.5740300776494305, 6.5745671772176, 6.5765800066688875, 6.576668924445839, 6.577433478044001, 6.581415815052412, 6.581415815052412, 6.583832447639102, 6.5839493205089, 6.5937094031723245, 6.594773023277709, 6.594773023277709, 6.598151789292499, 6.598341801716941, 6.601447744616501, 6.601656367900522, 6.603221304735626, 6.603799445352133, 6.606866000401228, 6.607290935924937, 6.607607894503343, 6.609273506474836, 6.610128693108229, 6.610782003649266, 6.6193254137787605, 6.619606443815482, 6.621279275021603, 6.626763644858304, 6.632662313913296, 6.634748809250411, 6.636183434313359, 6.64197589433519, 6.642509081275194, 6.643140704970422, 6.648304420001139, 6.648837944806505, 6.648837944806505, 6.64889480497781, 6.65363799437785, 6.654607156480699, 6.654607156480699, 6.656001085072552, 6.656104095867646, 6.65770556014761, 6.658013764339837, 6.659589835840315, 6.661165017509163, 6.6615418960411805, 6.662142139494058, 6.6625946530573540, 6.663958542933108, 6.664153286982001, 6.664705068488124, 6.666553922701021, 6.666553922701021, 6.668519141333328, 6.671047250647973, 6.671734826582854, 6.672506513148731, 6.673300208461942, 6.676234715699752, 6.677574649647963, 6.6782961205055384, 6.678885449567149, 6.683046151434791, 6.684482167028537, 6.68489747586173266, 6.68507305039816, 6.6851095458917325, 6.6857071592761965, 6.686079862493148, 6.68617892810734, 6.6881307056779695, 6.691408925252595, 6.691549660488942,

6.692064488660394, 6.6966719285981515, 6.700236719358828, 6.702207412102847, 6.703863660849486, 6.704774961679202, 6.712578309298047, 6.713219988530533, 6.713219988530533, 6.714476028881301, 6.715768213046353, 6.715768213046353, 6.7184206552957875, 6.720374802704588, 6.721178015066067, 6.721178015066067, 6.724468682524413, 6.724804136170593, 6.724845172165119, 6.726710723383964, 6.729131909931986, 6.730206821849381, 6.733550980837354, 6.734073126857639, 6.735958930394157, 6.735958930394157, 6.735987264969966, 6.73800742587002, 6.73927383830017, 6.743126622014652, 6.743572118414527, 6.745246048637543, 6.7474695442230495, 6.751329890301815, 6.752034354989172, 6.7525524008606626, 6.755712214335463, 6.756256714155883, 6.756256714155883, 6.756474337630578, 6.7578384350589475, 6.759509602283607, 6.760039908285847, 6.760777171488965, 6.761024652475679, 6.761194222306522, 6.762885582988337, 6.764041775579332, 6.766580309904622, 6.768062080383777, 6.775424228962183, 6.78189411034489, 6.78189411034489, 6.784922721148596, 6.792010104695734, 6.794609235500851, 6.798011900855878, 6.798547876236687, 6.798547876236687, 6.7994845755637465, 6.803045893874086, 6.812652612984836, 6.817207669247789, 6.817297101124284, 6.817345262473213, 6.817345262473213, 6.817666321315569, 6.817861343036608, 6.817861343036608, 6.81797987486879, 6.81797987486879, 6.818455123702197, 6.821550058129076, 6.825919949161523, 6.827163396641792, 6.82905012659661, 6.829930636310162, 6.83060955747417, 6.831690237351079, 6.8339933043975725, 6.83408587241932, 6.835655901980084, 6.836059082289339, 6.83568929834064, 6.83983483435624, 6.844991355150627, 6.850793410595059, 6.858726830988896, 6.861142923086679, 6.863544933942575, 6.865098190317583, 6.866828487957808, 6.868319180086188, 6.868665907811151, 6.872589520208395, 6.87512601407019, 6.877045304252575, 6.877164081520852, 6.877466676150804, 6.880067902972023, 6.880210580767854, 6.887858001406536, 6.8883850262450155, 6.889196183369847, 6.891034474952971, 6.891192137081892, 6.893442901098257, 6.894077983831021, 6.895096242878946, 6.895263919231498, 6.89846027943895, 6.898905276041763, 6.898905276041763, 6.89966612805807, 6.89966612805807, 6.9019071158027305, 6.902263472530222, 6.903422470983351, 6.903807616825378, 6.904547178858008, 6.906696619564065, 6.909481256532826, 6.9103981027797525, 6.912380176272999, 6.9155245216959695, 6.916134258829717, 6.920823706062102, 6.920823706062102, 6.925925694323067, 6.933910054884635, 6.935348385044635, 6.935348385044635, 6.9358150664562475, 6.93672060210614, 6.940236681370469, 6.9427047275528215, 6.94349606582944, 6.943864246143766, 6.945445243777008, 6.94548617341588, 6.9461941274776455, 6.9461941274776455, 6.948014742084604, 6.951665161045651, 6.953696148884713, 6.954456795196971, 6.955408476330439, 6.956599778367044, 6.956599778367044, 6.95725765906859, 6.958745233696448, 6.958745233696448, 6.964094543619826, 6.964094543619826, 6.965099980128629, 6.965721614410398, 6.966078357416931, 6.96805150813581, 6.968972267471465, 6.969569135999363, 6.971331876223753, 6.971680793627968, 6.971837935119907, 6.9727265820233235, 6.9727265820233235, 6.97416222248744, 6.974484351928755, 6.978894388894417, 6.985581538974281, 6.994423358961789, 6.995107631834881, 6.995153065315601, 6.996564890214971, 7.000069597424079, 7.002901548173775, 7.006243621090705, 7.006243621090705, 7.008886947444151, 7.015501221951271, 7.0164182947764795, 7.016552560642718, 7.021821065449053, 7.027901456648538, 7.029196675522239, 7.029252957878589, 7.029252957878589, 7.032347775563307, 7.036201351417298, 7.037720950533628, 7.039234379567216, 7.040242342140452, 7.040687152695357, 7.040687152695357, 7.041707832667364, 7.041707832667364, 7.045642204559465, 7.045901913731464, 7.045989377634537, 7.046035856195124, 7.050961886350346, 7.052552191923561, 7.056754755409504, 7.056754755409504, 7.059603515051933, 7.060805649627533, 7.067494453727931, 7.067494453727931, 7.069353332387506, 7.073705449110543, 7.07385570473472, 7.0751796029190235, 7.0751796029190235, 7.075850621610915, 7.076863344147546, 7.082682410996207, 7.086514956248358, 7.089417418381622, 7.089647730843968, 7.091336143962639, 7.0915981571175015, 7.09518533955598, 7.096796542586497, 7.102271969001604, 7.102271969001604, 7.105707713687864, 7.105707713687864, 7.107138213624873, 7.107528353570327, 7.107632795192697, 7.10860042148905, 7.10863244153918, 7.109454942773247, 7.1111168325248935, 7.112004980434359, 7.112966361658185, 7.113346146113212, 7.113486545387075, 7.115090112215032, 7.115273066974009, 7.116036701244847, 7.116702080767393, 7.117704943305228, 7.118890741008251, 7.119874733403924, 7.120647115733494, 7.121657365036484, 7.122071497363376, 7.123603862594501, 7.128717044503204, 7.128717044503204, 7.133970029003443, 7.144443306579202, 7.145308267162954, 7.145545205662964, 7.14682666740547, 7.15108451306418, 7.155206184619561, 7.157027720246327, 7.165649737536033, 7.1685783553032, 7.169984859444181, 7.171113949652185, 7.171113949652185, 7.174964146892873, 7.18035902676725, 7.181094039868923, 7.181828096694592, 7.1833741683623815, 7.1833741683623815, 7.1835467427326245, 7.18410529840739, 7.18425096226508, 7.18499525453845, 7.18603050437388, 7.186366378825893, 7.187346807747933, 7.188698862409223, 7.189125308660445, 7.1919228283984795, 7.193492473093588, 7.1939969877506575, 7.195022447684417, 7.195022447684417, 7.195963887374773, 7.197302752835355, 7.197302752835355, 7.201939482633911, 7.201965845193288, 7.213849307167987, 7.216194293112696, 7.219201719967934, 7.221245201165662, 7.225612080429614, 7.228497870862849, 7.242123101151651, 7.242408195997787, 7.243249956241815, 7.245633847344849, 7.247040656575052, 7.2483811633210555, 7.256013423537497, 7.256433996008859, 7.259885015534711, 7.260594082994481, 7.260594082994481, 7.261133380624174, 7.261793355987919, 7.2

62376698923179, 7.267138614430094, 7.276076580107344, 7.285090582304541, 7.2860529479055565, 7.2860529479055565, 7.291579782474 3604, 7.293689959251899, 7.302059571534122, 7.302514121803742, 7.304031595369388, 7.305371455174653, 7.305513602960931, 7.30623 9975004627, 7.306239975004627, 7.30662055298186, 7.3069331783802465, 7.308691478750717, 7.3107703994699005, 7.311272510715723, 7.311648489238024, 7.312885195367077, 7.313205785586706, 7.315665074232529, 7.316752886667805, 7.316945266577205, 7.3169959709 319725, 7.317029432677093, 7.317495680395178, 7.319854617887193, 7.320167552442543, 7.320243733290073, 7.320593446692918, 7.320 593446692918, 7.322492518383528, 7.323259637300626, 7.32542889103361, 7.32628562117244, 7.32898385616886, 7.329222400881219, 7. 33417619063394, 7.33417619063394, 7.334977842792443, 7.334999880394833, 7.344320584294438, 7.344320584294438, 7.34484321101729 6, 7.364513335987955, 7.3698212554070865, 7.3734021979314255, 7.375314577910471, 7.377695219255683, 7.379863542446369, 7.382803 068388183, 7.382938391782606, 7.383189550297367, 7.385082639368064, 7.386308759079525, 7.3891996027177, 7.391285082364741, 7.39 2102511738246, 7.3939525074521395, 7.396356375956477, 7.397606875103794, 7.3987882555029065, 7.4010875467261625, 7.401500122844 657, 7.406799670247273, 7.414511093352424, 7.416847393739017, 7.4207136171652115, 7.426526649364068, 7.426526649364068, 7.43193 0169698679, 7.431930169698679, 7.432186098728917, 7.433707933663483, 7.437519323140785, 7.439949944632884, 7.4406035011507115, 7.442688227672025, 7.443767728936026, 7.447339265159828, 7.450549301620331, 7.4514365171255355, 7.4514365171255355, 7.45407212 3810801, 7.457010512510034, 7.457899244383352, 7.459427732603475, 7.460863062862164, 7.464556264359001, 7.4684693794285835, 7.4 684693794285835, 7.470762853412413, 7.482303109800053, 7.4890256685318075, 7.489083683864523, 7.492900272636451, 7.492900272636 451, 7.494275370275099, 7.494397709861302, 7.494397709861302, 7.494538555501391, 7.502404356705224, 7.503787748644285, 7.503916 412199072, 7.505652558459015, 7.506590225739308, 7.507653344410202, 7.5102768896712195, 7.510711322595661, 7.513202226715866, 7.523803822057122, 7.52514064560489, 7.526704843517942, 7.529335313220654, 7.529559876778991, 7.534761701143299, 7.55701386721 0892, 7.559507102754512, 7.560988398610296, 7.560988398610296, 7.564069509312751, 7.566434990495341, 7.5686715334277, 7.5731129 32175762, 7.577449490236941, 7.578432967065396, 7.579057893126269, 7.579202202473071, 7.58203979297789, 7.583863141601835, 7.58 4231702736017, 7.586618868063001, 7.587493000260958, 7.588551961983441, 7.5910456181342925, 7.591480044339827, 7.59178481668977 7, 7.594447660346715, 7.594767581284622, 7.604381577844226, 7.6078336251365375, 7.616216571513754, 7.617037342257174, 7.6219577 74185758, 7.626214537499615, 7.626214537499615, 7.634180604744216, 7.639742038186838, 7.641262496467701, 7.643287611194281, 7.6 44014947957090, 7.644302619319258, 7.644469283277003, 7.645224083907178, 7.645603940951161, 7.647067734670755, 7.64993791261742 5, 7.652319473467444, 7.656966897650873, 7.656966897650873, 7.657070383460768, 7.658228244339704, 7.659263295783303, 7.65947406 7739227, 7.65998704318799, 7.665166530647558, 7.669655556717311, 7.686208635822097, 7.6877348989403105, 7.69139480614817, 7.691 966364605379, 7.692372793634549, 7.694022317724635, 7.6944693835865285, 7.6979285435058085, 7.698630870659644, 7.69892544721268 8, 7.700993005113752, 7.704318734766261, 7.707254449626585, 7.70878885360534, 7.709219629392765, 7.709456245876965, 7.710428545 990531, 7.710747751189197, 7.712738802333759, 7.714706289199033, 7.714933314431669, 7.717796140697956, 7.719822151318127, 7.719 822151318127, 7.720793452642966, 7.726353672392897, 7.726353672392897, 7.726640963108328, 7.7271230899288765, 7.73392644138948 7, 7.7363980312770115, 7.737714866946691, 7.746983081877103, 7.749411432563546, 7.76237321409424, 7.767185429349768, 7.76855017 3166723, 7.773695310963995, 7.7820853529100305, 7.782218442582877, 7.782218442582877, 7.786028903935934, 7.787304082519671, 7.7 88066305380452, 7.788387382445193, 7.789868823763555, 7.789875308091925, 7.800476440534708, 7.800787434611444, 7.80215091767026 2, 7.802311335047661, 7.819048601104377, 7.819560620927506, 7.819844226119135, 7.822783591746069, 7.828939376825327, 7.83186742 6208586, 7.833185683866614, 7.837046413646035, 7.839816130469915, 7.8399676629485535, 7.844746727279347, 7.84520688464869, 7.86 3945838080092, 7.865137538029937, 7.8669198456462865, 7.884901311953671, 7.892945024979603, 7.895340507234138, 7.89534050723413 8, 7.897794642695226, 7.902613445349481, 7.903541935660198, 7.905893633117981, 7.907123330330462, 7.910009081059441, 7.91157242 4543684, 7.911572424543684, 7.916694010892912, 7.916694010892912, 7.917820172240054, 7.917839117140577, 7.920036455378972, 7.92 1126455434835, 7.921126455434835, 7.922705505324814, 7.9260025469469415, 7.927280068978275, 7.927280068978275, 7.93107678930526 9, 7.9370782367253785, 7.939932206749091, 7.946415875506629, 7.94828805817764, 7.951210243679613, 7.951480867773165, 7.95402159 6322549, 7.970070213004647, 7.970515082498899, 7.971808084767952, 7.97788758825607, 7.978365398543678, 7.978774338064046, 7.980 0492539618295, 7.983117740687658, 7.983117740687658, 7.986081095469883, 7.988508160495812, 8.019883157195045, 8.02219511655615 1, 8.026074817186668, 8.027130808922387, 8.027870325470243, 8.028095057613745, 8.029378222168628, 8.03701862081454, 8.040648997 156334, 8.041815430010185, 8.041815430010185, 8.04763842085739, 8.059505335247197, 8.060486019888623, 8.06741818427554, 8.06741 818427554, 8.0700098447405, 8.071895668143782, 8.077129331545608, 8.078744962919554, 8.07904222397489, 8.079766328988985, 8.080 03989819254, 8.083322944529874, 8.086236751351223, 8.092161408524692, 8.092268488860885, 8.092268488860885, 8.096161570896578,

8.098455481617403, 8.100056809632292, 8.100628388865013, 8.10200159281777, 8.10241633352491, 8.103609341965512, 8.107554973213903, 8.119735391253602, 8.125086266685896, 8.127196784010717, 8.132390973854783, 8.14564659247966, 8.146184436167262, 8.146623685024922, 8.147088409306372, 8.147095689131064, 8.147552173070771, 8.149463886443082, 8.149510509895654, 8.150537119297521, 8.150612556498112, 8.151856223408313, 8.15291519680872, 8.157013301160115, 8.161660403069856, 8.163110804592703, 8.163167356296352, 8.165178291320412, 8.167208233571875, 8.170349131577733, 8.1872017266408, 8.19254631463195, 8.195033871033733, 8.202745403389908, 8.208749404346964, 8.21159836810683, 8.212406277322545, 8.21244698046416, 8.21773088423003, 8.220995291146405, 8.22270100379844, 8.223066497529508, 8.224743614266167, 8.225325782894535, 8.225629390407025, 8.226061213822073, 8.22933986513749, 8.239945021466518, 8.239945021466518, 8.25319406568422, 8.255262636702703, 8.262255633468769, 8.266948393209507, 8.26744017699727, 8.271099550088959, 8.274183315969344, 8.278740598614066, 8.278906321116057, 8.280542352280431, 8.284869051497877, 8.286620749156313, 8.288165733846904, 8.289688298143764, 8.289688298143764, 8.290401338724232, 8.304565939631953, 8.314462968846893, 8.318215787178165, 8.326326815936278, 8.32749984391492, 8.329850350354466, 8.332484424678483, 8.339643537382994, 8.340213535661368, 8.340213535661368, 8.340383092590784, 8.342704846694001, 8.34610274153392, 8.349123153978468, 8.351787957947272, 8.358746663394431, 8.358746663394431, 8.36015080919642, 8.362051641224586, 8.364893698724357, 8.366862183042924, 8.381574734037464, 8.382674290469064, 8.382927475646046, 8.383405458225948, 8.384732589335329, 8.385044751322537, 8.38628252693401, 8.387054254713819, 8.38944258892348, 8.39032071913159, 8.393771998936375, 8.395154280398625, 8.396794256503618, 8.402814522884457, 8.402814522884457, 8.407443027397198, 8.424627267068706, 8.425384051913712, 8.425384051913712, 8.429701034538981, 8.430042158100962, 8.453280673426574, 8.453384639531627, 8.456170618530207, 8.466941760751958, 8.467285084016218, 8.470991915315503, 8.483026865898228, 8.48349843833962, 8.488561256428484, 8.48978639327595, 8.492162555944121, 8.492162555944121, 8.49710591033885, 8.49939440549189, 8.512669268096447, 8.52624130100447, 8.526270902576135, 8.52748771926029, 8.52748771926029, 8.532707641269962, 8.542126912753673, 8.54986308765364, 8.55094244669535, 8.569241195991333, 8.577680246605132, 8.589756053700798, 8.592108232451073, 8.606111960688933, 8.606111960688933, 8.611030176887642, 8.61260451534244, 8.620181010167288, 8.62842546720782, 8.63452933999883, 8.635925103178138, 8.63837441956042, 8.642688224079134, 8.643853403067594, 8.64778807665313, 8.647840078511866, 8.664691650687564, 8.664691650687564, 8.669529211824868, 8.673983894589096, 8.68170720560685, 8.683662743357363, 8.685026734271787, 8.687201776333705, 8.691951436969516, 8.693271821026434, 8.693440263395313, 8.693756055840343, 8.703113464063776, 8.703714417990847, 8.703840978057855, 8.714013167095253, 8.714905208619426, 8.722175630836741, 8.73008109824267, 8.732731768487328, 8.734081344844107, 8.742174571543957, 8.750512197658873, 8.7505519215606, 8.751158938675031, 8.751738220863194, 8.755503548537217, 8.771098936671654, 8.783495174572561, 8.785529524718346, 8.795552804961458, 8.795552804961458, 8.795972221004089, 8.802550445685007, 8.802984423471289, 8.802984423471289, 8.804742204578776, 8.805745605892492, 8.80647411314661, 8.812417897553361, 8.813778218092036, 8.813778218092036, 8.826105303745669, 8.826105303745669, 8.826624946928872, 8.827317400983553, 8.83287542785537, 8.838335186806624, 8.843930408738476, 8.854101058552025, 8.854101058552025, 8.860777935905624, 8.860777935905624, 8.863047851579582, 8.863047851579582, 8.86422231618423, 8.86422231618423, 8.8650815809549, 8.865303911889628, 8.866104301474909, 8.866879934268326, 8.869088616682639, 8.869796287047743, 8.870137171073884, 8.870554737102476, 8.876425953739686, 8.879323166592204, 8.881579320923082, 8.88597582745705, 8.905652689314863, 8.907358150893314, 8.907358150893314, 8.91230310598012, 8.91321866504898, 8.91579026309587, 8.916009594669461, 8.917098739811664, 8.918687228422973, 8.92399123428053, 8.92520956504146, 8.92520956504146, 8.925942615386406, 8.952466088546585, 8.956818682372667, 8.976628235159822, 8.976628235159822, 8.976821484855106, 8.977039504676197, 8.978332719500358, 8.978332719500358, 8.985250242928117, 8.99173843291147, 9.016091343370345, 9.016393252851847, 9.01678945288211, 9.025750962730765, 9.025750962730765, 9.02920496554284, 9.030185540453173, 9.030532596620644, 9.038343745322367, 9.053045638886738, 9.06111707802236, 9.065850994127805, 9.07739206286608, 9.082119733750606, 9.095049072716405, 9.095498648685766, 9.095765975307426, 9.097050806931623, 9.130333084234477, 9.130333084234477, 9.132078007691721, 9.134984086828503, 9.139374562472938, 9.177704345131701, 9.177704345131701, 9.181448224356537, 9.186414561209014, 9.18677614618402, 9.18687805793027, 9.19259545966438, 9.196370440549527, 9.198825744636098, 9.199611781011178, 9.199611781011178, 9.201856977424539, 9.201856977424539, 9.212460480579688, 9.213122164995074, 9.220916280699084, 9.225752896964023, 9.228740382478, 9.24428894885152, 9.245757864337111, 9.248423442479057, 9.249527972383923, 9.252102027131917, 9.254883383132452, 9.27544122752332, 9.276806995616058, 9.27994213172138, 9.281458223108316, 9.282375092499835, 9.292727513944383, 9.293203042773044, 9.294201693050983, 9.294335457744587, 9.295481755555686, 9.297445890863248, 9.297883703450308, 9.298104955023998, 9.298104955023998, 9.298167082165383, 9.304180326223188, 9.305999346761261, 9.307071553177348, 9.309550678501832, 9.311866703364428, 9.332165134701807, 9.332514619174393, 9.334659656252265, 9.34223873413027, 9.345406592

402012, 9.350723697679756, 9.35328162814685, 9.354035264397801, 9.356387440179166, 9.356650553577193, 9.356895846237776, 9.360766134643702, 9.363489509933183, 9.365340888436162, 9.371068397525818, 9.376698059596631, 9.37781915287152, 9.380641631382677, 9.384269931199736, 9.391181153219566, 9.39471846136608, 9.396627658659405, 9.406514308755353, 9.40783875719669, 9.413122761255598, 9.42411154347797, 9.430623919396453, 9.43506728537219, 9.445639831473153, 9.451461863483527, 9.451461863483527, 9.45203888459249, 9.46002509279789, 9.463597551484321, 9.47558246912569, 9.476615941097995, 9.477139662156048, 9.488738482330119, 9.492163028503077, 9.492163028503077, 9.502011573721704, 9.502011573721704, 9.511325590577544, 9.511987256326929, 9.513948700664537, 9.51535822219638, 9.521243898511011, 9.543961678649309, 9.564292080975344, 9.565427966563654, 9.565547710600663, 9.566882835555946, 9.57203050796022, 9.600950546088612, 9.601069129065747, 9.603136573417816, 9.60401052102892, 9.60500481130381, 9.60992863068187, 9.614444438697888, 9.614444438697888, 9.617283879482065, 9.628074160794167, 9.62990166217347, 9.657539439535755, 9.672058288641315, 9.68004843330538, 9.680281829079842, 9.680281829079842, 9.68076212085955, 9.680937912194093, 9.701910246202413, 9.702659615946512, 9.702782199594761, 9.702782199594761, 9.705096016968945, 9.705096016968945, 9.709024361729227, 9.71521863422653, 9.72140057347815, 9.72140057347815, 9.728100413426928, 9.731078573369226, 9.733206767508499, 9.75113854022591, 9.756135899758954, 9.767429213674854, 9.771429945619387, 9.775441037716876, 9.777339351279625, 9.778528808549117, 9.779607680786139, 9.79543702058853, 9.79543702058853, 9.80746316644511, 9.811997650785713, 9.81432712073016, 9.822198382077193, 9.825387266376865, 9.827413552752972, 9.829493231911316, 9.831961935948012, 9.841865213783706, 9.845726758769919, 9.859098343756822, 9.875081775420878, 9.888403974781298, 9.900678542552354, 9.914991169699979, 9.918952918501631, 9.919159208103405, 9.921244606923247, 9.925236575290274, 9.927095642867819, 9.928281213462865, 9.932015552673164, 9.932015552673164, 9.933080840087916, 9.949358956569654, 9.976078135563052, 9.98412053410241, 9.985485654055761, 9.986932479185386, 9.999644540214918, 10.005594201174379, 10.0063874070589, 10.010688562270632, 10.023207098258517, 10.025754141849678, 10.025754141849678, 10.030919829929578, 10.033060717393303, 10.034696178847506, 10.035140157819276, 10.035140157819276, 10.03897284972608, 10.061161624407129, 10.064189755157157, 10.065810528803627, 10.071940079214862, 10.072888120696486, 10.074564777741934, 10.076606123678753, 10.080613432187722, 10.108075725188709, 10.110356442960999, 10.110356442960999, 10.129217472637425, 10.13625902225758, 10.13877017481384, 10.150330166304117, 10.15378468133294, 10.158775039306903, 10.164674944042506, 10.177586227926703, 10.20212856533999, 10.206753301226398, 10.21476549174392, 10.219115361911769, 10.224237243706428, 10.227549433504045, 10.22835203891573, 10.23080860086095, 10.236261415685707, 10.2609101016064164, 10.264157093421145, 10.266856829400792, 10.267530336111703, 10.292524018632129, 10.29480613126592, 10.30639524127057, 10.318906018805635, 10.320554098982884, 10.320845856695456, 10.320845856695456, 10.327338548572724, 10.32770219237521, 10.327733211920599, 10.347979305123296, 10.362645659658442, 10.365251718456875, 10.365251718456875, 10.371791902318975, 10.388922949421184, 10.398991054726721, 10.410021162227048, 10.411241924536824, 10.416630077376755, 10.425664057677695, 10.434213588247808, 10.439994619287814, 10.439994619287814, 10.453371552668703, 10.46662981322792, 10.482316107810876, 10.486366843984586, 10.53442234585833, 10.551454311713897, 10.582801172973413, 10.603996940341421, 10.603996940341421, 10.610101746655369, 10.610101746655369, 10.631174996525035, 10.647407116097796, 10.652826605131006, 10.660195933691899, 10.690312948048488, 10.70730616844389, 10.72628175499759, 10.761670120662252, 10.762719896257241, 10.767249014446774, 10.769854962255883, 10.784510690881605, 10.789942456589136, 10.795341323170788, 10.796789538065603, 10.797450696814051, 10.82258956359254, 10.826688500322517, 10.826688500322517, 10.830448290338758, 10.839632114008202, 10.848484878923351, 10.871952193009992, 10.874334198462153, 10.874334198462153, 10.876178872034053, 10.879755237920925, 10.909416888066374, 10.912884275661007, 10.933790532831269, 10.956196846887176, 10.963214054175602, 10.966040614437333, 10.971843782319672, 10.985585936049803, 10.986079580254064, 10.99578235910883, 11.00156452390559, 11.015468312271327, 11.018905775312565, 11.025493109836994, 11.060455659303418, 11.06666241820164, 11.102766052555836, 11.103698336023477, 11.10515605477814, 11.108651142253889, 11.1126046917149, 11.12170645292403, 11.12251802517848, 11.126265364610088, 11.147713842471031, 11.156138905662107, 11.160749457997394, 11.165611692867166, 11.177895810412789, 11.1937250614818, 11.194008995605817, 11.195092492527772, 11.196920102305363, 11.19749790085147, 11.20438845271338, 11.205665654062047, 11.214708251858502, 11.228226227486978, 11.235072053069729, 11.235072053069729, 11.25465007103372, 11.257949218137142, 11.278983098778466, 11.29148232318604494, 11.299510534725382, 11.314977662413177, 11.321507350096603, 11.326805149803086, 11.342139788007488, 11.34223545524342, 11.343126143439562, 11.359084716435323, 11.366291493202699, 11.370948500982987, 11.386091470006182, 11.386091470006182, 11.392576496670078, 11.392654033120728, 11.392654033120728, 11.44301693907511, 11.44301693907511, 11.450156314304174, 11.450156314304174, 11.452207880704343, 11.467030304031901, 11.470041353254727, 11.521519538801478, 11.545097067810218, 11.550742318767368, 11.554654828873518, 11.557197763717637, 11.566655249382853, 11.593043793929947, 11.59592008784482, 11.59642155985673, 11.6

03735463922701, 11.604228747541493, 11.616301957299113, 11.661094770035175, 11.68597341235912, 11.68931788724586, 11.69116035102617, 11.7155973109793, 11.734895945185702, 11.738351132425992, 11.738351132425992, 11.768295386572241, 11.807925544266201, 11.821297684280387, 11.852151446092666, 11.85831705557228, 11.85831705557228, 11.861395608157418, 11.883450074262852, 11.890213545647422, 11.896621763648948, 11.902384486978274, 11.905306150088919, 11.91570797299317, 11.917768966205674, 11.922751693041134, 11.922751693041134, 11.934650834221681, 11.94103646472659, 11.94655156866586, 11.961014420789956, 12.00885214725697, 12.02056544323597, 12.021572462449978, 12.021649777117037, 12.022048762424195, 12.02566332781118, 12.027423941545841, 12.056731620044273, 12.05895711952157, 12.05895711952157, 12.060407089913115, 12.062538772865473, 12.069829375434262, 12.093661801286498, 12.100436603264583, 12.100436603264583, 12.112768904072624, 12.120040330815012, 12.125039053306065, 12.144149404562294, 12.153362933916748, 12.175279953418663, 12.185423508074763, 12.186289057316797, 12.186355533337178, 12.193616364153234, 12.224112553718777, 12.250859814793937, 12.253188989723824, 12.25364313225067, 12.263276334930927, 12.297837117473852, 12.314923093260335, 12.337657007007714, 12.344759538786128, 12.345360653272127, 12.357091955641199, 12.357433824944493, 12.359400992496747, 12.35964406934407, 12.387930257850716, 12.3900942028756, 12.430542858335789, 12.436679834284899, 12.4479287318566, 12.452305641353941, 12.471455945579035, 12.472594767026717, 12.486899590635959, 12.518212247761273, 12.52843501780146, 7, 12.547898139150911, 12.555166530668886, 12.556768411233099, 12.569911882258161, 12.585624202413912, 12.593583604189709, 12.600958854690871, 12.601380787637359, 12.606623021637011, 12.634197787712859, 12.651527120741726, 12.65994983232795, 12.666506946932202, 12.670204308313647, 12.671732983703386, 12.672947597444452, 12.695418467397818, 12.716310968910733, 12.751130153534215, 12.75149186891485, 12.781188782191363, 12.792241289371574, 12.79369710799338, 12.794612228335449, 12.802601967445867, 12.814742311482295, 12.814742311482295, 12.82763830583775, 12.830319279900467, 12.831769494869286, 12.845747213005868, 12.859336902349623, 12.859606875520443, 12.859606875520443, 12.861770662609752, 12.898950831401175, 12.900281473512972, 12.903401912417108, 12.909260578764176, 12.929399782779774, 12.938066770662626, 12.950829714945026, 12.950956440913417, 12.967074130119023, 12.985267868403982, 12.985267868403982, 13.027717761978382, 13.045238463399814, 13.048976893685248, 13.060028666064662, 13.060028666064662, 13.129965066592863, 13.153609311745065, 13.19873558234178, 13.19873558234178, 13.249329237172379, 13.251596782699593, 13.300683597176032, 13.332110591079521, 13.361102470525895, 13.405011619631908, 13.471384887290395, 13.475722142569266, 13.539903219275724, 13.548072986029343, 13.550267809870641, 13.56065440343303, 13.569439534595345, 13.574044048170956, 13.574044048170956, 13.578309950289793, 13.591500883297895, 13.592573802789763, 13.656445252034802, 13.658780842081315, 13.658780842081315, 13.666433694929868, 13.696831672080604, 13.701191964491226, 13.728101024106529, 13.77733442371879, 13.77733442371879, 13.796670754841903, 13.79754352437607, 13.802259688853212, 13.809371287081293, 13.828851922512673, 13.833040536523042, 13.83486865347053, 13.83486865347053, 13.848548559302774, 13.949441402352887, 14.012389023683172, 14.017065232864661, 14.017065232864661, 14.0258930909948, 14.0258930909948, 14.029691193712631, 14.029691193712631, 14.079280315551856, 14.086645070622831, 14.130581976387921, 14.132092755596908, 14.141911239732003, 14.15987603810444, 14.16281797674859, 14.183801838648769, 14.197999167211167, 14.279711745661205, 14.300853059900788, 14.332976418497507, 14.351992191917851, 14.354576366586642, 14.369710085599605, 14.373637409919267, 14.384003296552725, 14.40607630966933, 14.408469878974781, 14.417725937854984, 14.42038626448702, 14.432502911026951, 14.44115257172751, 14.447906245136416, 14.455837895627697, 14.479635731861302, 14.577140986925112, 14.632856046238416, 14.640255637496319, 14.698251757286434, 14.745945117581273, 14.8137797730254, 14.819021835688783, 14.825019050951344, 14.866760306022671, 14.87737200396935, 14.878506358963902, 14.912183570950392, 14.912183570950392, 14.923203036328726, 14.924670200441989, 14.924670200441989, 14.928954380760025, 14.938466173802354, 14.976220872331462, 15.013758924578465, 15.013758924578465, 15.04096447072045, 15.041462165172131, 15.067089700967717, 15.082716656249438, 15.109624705104261, 15.131304913785584, 15.141061074476807, 15.181556099894552, 15.186067010411026, 15.215328740789358, 15.215328740789358, 15.259248213984856, 15.282976645626569, 15.306352566268604, 15.312683946297128, 15.400774667030488, 15.45860546236299, 15.474111587430682, 15.490648352760788, 15.490648352760788, 15.535690893006954, 15.56610820667035, 15.6046202893897, 15.613013586537344, 15.669059537836214, 15.706089303373986, 15.729859473531443, 15.775249872186208, 15.854035140512899, 15.876772452897796, 15.885732804584054, 15.891150369812214, 15.891942829454893, 15.891942829454893, 15.910479045016771, 15.923007889690847, 15.932640104313307, 15.972275219468893, 15.982680025928255, 16.01099473765747, 16.01402425555942, 16.015770623776486, 16.015770623776486, 16.05134787941449, 16.05433989929756, 16.067434712526534, 16.083763364391682, 16.08470645980061, 16.114068750211636, 16.128679964087752, 16.146072407423382, 16.18730270386041, 16.201375414130162, 16.20518746124365, 16.23015870478521, 16.23015870478521, 16.231034160854, 16.232179976215136, 16.233566772166856, 16.23821508814173, 16.24102466127631, 16.26104247536234, 16.369281463556177, 16.50679254602769, 16.50888341863471, 16.50888341863471, 16.511466967032593, 16.5

22146279744163, 16.60110395829726, 16.633043150191504, 16.65075594374845, 16.663778546360007, 16.670043627982093, 16.7243603153 15508, 16.77133893147293, 16.78990401705253, 16.81158555594604, 16.832772497092133, 16.8492155249316, 16.87726943308641, 16.877 26943308641, 16.8945050146433, 16.894968692258818, 16.91894629952263, 16.92403165022252, 17.0930705242681, 17.10733782604609, 1 7.176664531266713, 17.176664531266713, 17.20630426754059, 17.28003973983507, 17.30799648189693, 17.32840558905777, 17.361185307 587622, 17.41516021565335, 17.431763525359735, 17.463869681793224, 17.466999152048857, 17.496156324245046, 17.53874550912338, 1 7.543521233055756, 17.59927427365517, 17.606671446316618, 17.62256706546062, 17.65422101032432, 17.66049928373584, 17.670175024 969396, 17.670175024969396, 17.743315324834075, 17.79609722109043, 17.79609722109043, 17.841850990000342, 17.881597243396573, 1 7.889759943702174, 17.973395098730258, 17.98836937771186, 18.005343511599186, 18.0979251182452, 18.14538834560804, 18.235049910 667744, 18.258151168135537, 18.287401351228816, 18.308907784738135, 18.325957167563068, 18.37637748729584, 18.420773942224162, 18.48069469446933, 18.508921025259955, 18.513208219851656, 18.52573700472608, 18.565235700339557, 18.572468552109804, 18.66781 001533185, 18.671885829883692, 18.69973964773777, 18.786982181140825, 18.786982181140825, 18.804632461173995, 18.80463246117399 5, 18.859428736008592, 18.928041956666473, 18.97259759484339, 19.06439627038171, 19.073224455589727, 19.093450713739525, 19.095 715490139767, 19.215482573965957, 19.25321352155271, 19.261678217241204, 19.277739129379928, 19.31138508151744, 19.328902675863 255, 19.391862136891557, 19.42589770487602, 19.63286184587915, 19.723738810853856, 19.725975521809087, 19.85914971323539, 19.86 464042258447, 19.891860044778007, 19.891860044778007, 19.918105152596404, 19.965283199795955, 20.035154172900917, 20.0522587530 169, 20.091656746530724, 20.100658785627644, 20.108136594847352, 20.13520565692531, 20.143340360627356, 20.18091890621278, 20.2 62845748664528, 20.27117731743484, 20.312439505608594, 20.49352170071848, 20.494031474127816, 20.561328683219905, 20.5636132272 48016, 20.787251461111808, 20.86360308826517, 20.877257394516278, 21.056281135749273, 21.072741774134958, 21.125376364658862, 2 1.128794683651876, 21.243195001905466, 21.35028679587362, 21.391494913553533, 21.392556657554906, 21.392556657554906, 21.511186 3600016, 21.554970510280068, 21.585208923051137, 21.662149739041954, 21.84185759435605, 21.85450504879884, 21.8651135585666, 2 1.874620259070056, 21.915448928360313, 22.17614922203386, 22.218820454420275, 22.272655791156886, 22.27961380221854, 22.2855043 33377588, 22.3490279144819, 22.36579456586976, 22.467590119145836, 22.560696051841955, 22.567743853282398, 22.62278452967269, 2 2.72751484913756, 22.795144843106236, 22.81814070870007, 22.87466370483433, 23.1038213794089, 23.26651704339142, 23.28903971433 6496, 23.35912674184947, 23.362555815474362, 23.37579690661957, 23.37639258352835, 23.396814756141996, 23.455311653346893, 23.4 87450353862343, 23.552104465571333, 23.552104465571333, 23.591237204281054, 23.613353121206323, 23.656672521420447, 23.73436310 7831324, 23.824848130014313, 23.883463560265227, 24.055898265229022, 24.19708332610262, 24.541228870367853, 24.60118893409331, 24.62407143813275, 24.641073619237716, 24.645607327384955, 24.716021522726948, 24.965158617704805, 24.998732332610135, 25.1928 7117864241, 25.26676705929561, 25.285140078222348, 25.31066027941576, 25.52190995685666, 25.649822218757283, 25.71119253256945 2, 25.805815992830826, 25.805815992830826, 25.86642557265144, 25.89821657613677, 25.89821657613677, 26.266983790217555, 26.2972 42458429857, 26.371004964256002, 26.371004964256002, 26.393391265738508, 26.40149126405705, 26.40149126405705, 26.7838281906478 4, 26.928964551512664, 27.15735596618053, 27.279995162788488, 27.31562004227828, 27.464036240887364, 27.593468044888407, 27.654 454393194623, 27.735481801339247, 28.001453577128324, 28.0511202804782, 28.11111877747665, 28.133721694115863, 28.2557761563779 16, 28.46930920595495, 28.53691309775469, 28.61312025886831, 28.993609426662978, 29.3499836122716, 29.42305267397132, 29.651259 219308297, 30.029730058490745, 30.0313597954525, 30.19017317460898, 30.19017317460898, 30.29208039848262, 30.55247500516538, 3 1.02194995430468, 31.224211630158923, 31.987183739890757, 32.21323907594917, 32.741278323769215, 32.75792156037575, 33.08930667 506088, 33.26804695300678, 33.335320993100886, 34.0054942728453, 34.31342173384161, 34.9792966631065715, 35.150744775248214, 35. 44824308005467, 35.44824308005467, 35.72301991385793, 36.19250681573818, 36.229285845881144, 36.552074024425096, 37.35263328964 224, 37.61238846680592, 38.19696256985591, 38.27552829881847, 38.65837005087339, 39.2786293967241, 40.56239068064234, 41.323085 07850279, 41.348503211521205, 41.935767440151956, 41.935767440151956, 42.07346376402558, 42.75020160972529, 43.269603177937384, 43.66199104879246, 44.00155437966707, 44.06938593449759, 44.39814840101505, 44.45937365675392, 45.239903451915815, 46.373957519 99641, 46.94629680516898, 47.635536337182096, 47.675509797564175, 48.11576811453358, 48.36610105041495, 49.6918902381153, 49.79 4410228307285, 51.48004806616418, 51.68763616488829, 53.67685542000276, 53.98193760264424, 57.53756359606853, 58.1784548735810 1, 60.62077435460484, 61.57444940231917, 63.800810347736345, 67.45576136074375, 74.85739289113988, 75.86681890229488, 86.594421 62297152, 92.4426617329453, 111.87391182916254, 114.02301820456191, 155.55476041199674, 272.28753272334734, 282.37315758781193, 529.802116903755]

```
CPU times: user 1min 6s, sys: 197 ms, total: 1min 6s
Wall time: 1min 6s
```

In [0]:
```
%%time
Cl_Pa=range(D_shape)

# Performance of model on data for each hyper parameter.
plt.close()
plt.plot(Cl_Pa, mp_dist, label='Epsilon',c='orange')
plt.gca()
plt.legend()
plt.xlabel("Rows")
plt.ylabel("Min point distance")
plt.title("Hyperparameter tuning : Choosing Epsilon value")
plt.axhline(y=20, xmin=0, xmax=0.94, ls='--',c='red')
plt.axvline(x=10780, ymin=0, ymax=0.1, ls='--', c='red')
plt.grid()
plt.show()
```
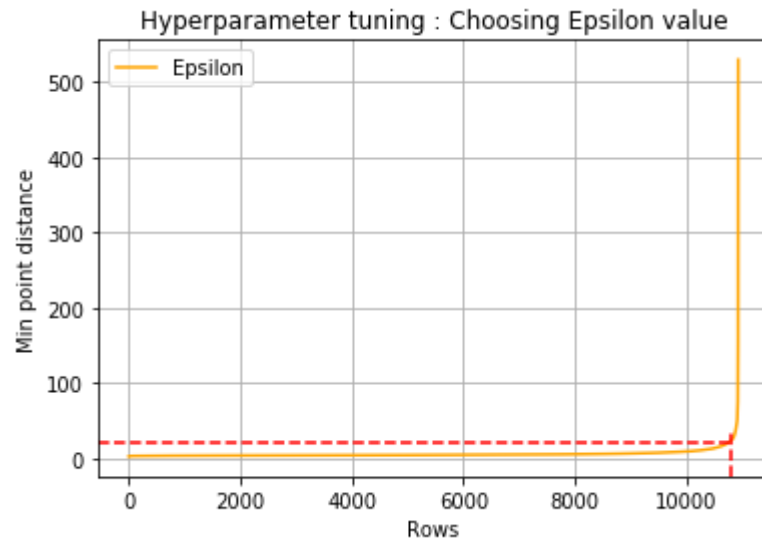


```
CPU times: user 254 ms, sys: 101 ms, total: 355 ms
Wall time: 242 ms
```

OBSERVATION:
From the above graph we can see that sharp drop at value 20.
Hence Epsilon value is choosen as 20.

```
In [0]:  dbs_opt=5
         dbscan_opt = DBSCAN(eps=20, min_samples=minPts, n_jobs=-1).fit(X_5K_Feat)

         def Cluster_Seperation(lbl,i_val):
           c = []
           c.append(essays[i])
           return c

         essays = X_Tr_Es_DS['essay'].values
         Clstr=[]
         for j in range(dbs_opt):
           for i in range(dbscan_opt.labels_.shape[0]):
             if dbscan_opt.labels_[i] == j:
               clstr_val=Cluster_Seperation(dbscan_opt.labels_,i)
               Clstr.append(Clstr)
               if(i == j):
                 break;
           words=''
           for i in clstr_val:
             words+=str(i)

           print(f"Word Cloud for Cluster:{j+1}")
           wordcloud = WordCloud(background_color="white",stopwords = stopwords,min_font_size = 5,random_state=0,repeat=False).generate(
         words)
           # Display the generated image:
           plt.close()
           plt.figure(figsize = (10, 10), facecolor = None)
           plt.imshow(wordcloud, interpolation='bilinear')
           plt.axis("off")
           plt.show()
           print("--"*60)
```

Word Cloud for Cluster:1

Word Cloud for Cluster:2

Word Cloud for Cluster:3

Word Cloud for Cluster:4

Word Cloud for Cluster:5

----

3. Conclusions

Compare to the "Agglomerative and DBSCAN".KMean took lot of time and Space complexity.
When epsilon value not selected propely model could failed to work(I.e., Hyperparmeter are highly senstive).Hence epsilon and minpoint needs to be select very carefully.