```
!pip install scikit-surprise
```

```
Collecting scikit-surprise
  Downloading scikit-surprise-1.1.3.tar.gz (771 kB)
     ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 772.0/772.0 kB 7.4 MB/s eta 0:00:00
  Preparing metadata (setup.py) ... done
Requirement already satisfied: joblib>=1.0.0 in /usr/local/lib/python3.10/dist-packages (from scikit-surprise) (1.4.0)
Requirement already satisfied: numpy>=1.17.3 in /usr/local/lib/python3.10/dist-packages (from scikit-surprise) (1.25.2)
Requirement already satisfied: scipy>=1.3.2 in /usr/local/lib/python3.10/dist-packages (from scikit-surprise) (1.11.4)
Building wheels for collected packages: scikit-surprise
  Building wheel for scikit-surprise (setup.py) ... done
  Created wheel for scikit-surprise: filename=scikit_surprise-1.1.3-cp310-cp310-linux_x86_64.whl size=3162996 sha256=461f0b8d8ae5476
  Stored in directory: /root/.cache/pip/wheels/a5/ca/a8/4e28def53797fdc4363ca4af740db15a9c2f1595ebc51fb445
Successfully built scikit-surprise
Installing collected packages: scikit-surprise
Successfully installed scikit-surprise-1.1.3
```

```
import pandas as pd
df=pd.read_csv("/content/amazon.csv")
```

```
df
```

	product_id	product_name	rating	user_id	
0	B07JW9H4J1	Wayona Nylon Braided USB to Lightning Fast Cha...	4.2	AG3D6O4STAQKAY2UVGEUV46KN35Q,AHMY5CWJMMK5BJRBB...	R3HXWT0LRP0NMF,R2AJM3LFTI
1	B098NS6PVG	Ambrane Unbreakable 60W / 3A Fast Charging 1.5...	4	AECPFYFQVRUWC3KGNLJIOREFP5LQ,AGYYVPDD7YG7FYNBX...	RGIQEG07R9HS2,R1SMWZQ86X
2	B096MSW6CT	Sounce Fast Phone Charging Cable & Data Sync U...	3.9	AGU3BBQ2V2DDAMOAKGFAWDDQ6QHA,AESFLDV2PT363T2AQ...	R3J3EQQ9TZI5ZJ,R3E7WBGK
3	B08HDJ86NZ	boAt Deuce USB 300 2 in 1 Type-C & Micro USB S...	4.2	AEWAZDZZJLQUYVOVGBEUKSLXHQ5A,AG5HTSFRRE6NL3M5S...	R3EEUZKKK9J36I,R3HJVYCLYO
4	B08CF3B7N1	Portronics Konnect L 1.2M Fast Charging 3A 8 P...	4.2	AE3Q6KSUK5P75D5HFYHCRAOLODSA,AFUGIFH5ZAFXRDSZH...	R1BP4L2HH9TFUP,R16PVJEXK
...	...	...	...	...	
1460	B08L7J3T31	Noir Aqua - 5pcs PP Spun Filter + 1 Spanner | ...	4	AHITFY6AHALOFOHOZEOC6XBP4FEA,AFRABBODZJZQB6Z4U...	R3G3XFHPBFF0E8,R3C0BZCD32
1461	B01M6453MB	Prestige Delight PRWO Electric Rice Cooker (1 ...	4.1	AFG5FM3NEMOL6BNFRV2NK5FNJCHQ,AGEINTRN6Z563RMLH...	R3DDL2UPKQ2CK9,R2SYYU1O
1462	B009P2LIL4	Bajaj Majesty RX10 2000 Watts Heat Convector R...	3.6	AGVPWCMAHYQWJOQKMUJN4DW3KM5Q,AF4Q3E66MY4SR7YQZ...	R1TLRJVW4STY5I,R2O455KRN
1463	B00J5DYCCA	Havells Ventil Air DSP 230mm Exhaust Fan (Pist...	4	AF2JQCLSCY3QJATWUNNHUSVUPNQQ,AFDMLUXC5LS5RXDJS...	R39Q2Y79MM9SWK,R3079BG1N
1464	B01486F4G6	Borosil Jumbo 1000-Watt Grill Sandwich Maker (...	4.3	AFGW5PT3R6ZAVQR4Y5MWVAKBZAYA,AG7QNJ2SCS5VS5VYY...	R20RBRZ0WEUJT9,ROKIFK9R

1465 rows × 7 columns

```
df.columns
```

```
Index(['product_id', 'product_name', 'rating', 'user_id', 'review_id',
       'review_title', 'review_content'],
      dtype='object')
```

```
import pandas as pd
from surprise import SVD, Dataset, Reader
from surprise.model_selection import train_test_split

# Load your dataset
data = pd.read_csv('/content/amazon.csv')

# Drop rows with missing values in these critical columns
data.dropna(subset=['user_id', 'product_id', 'rating'], inplace=True)


data['rating'] = data['rating'].str.replace('|', '', regex=False)
data['rating'] = pd.to_numeric(data['rating'].replace('|', None), errors='coerce').dropna()
data['rating'] = data['rating'].astype(float)

# Prepare the data for Surprise
reader = Reader(rating_scale=(1, 5))  # Adjust the rating scale if necessary
data = Dataset.load_from_df(data[['user_id', 'product_id', 'rating']], reader)

# Split the data into training and testing sets
trainset, testset = train_test_split(data, test_size=0.2)

# Create and train the SVD model
model = SVD()
model.fit(trainset)

# Test the model and collect predictions
predictions = model.test(testset)

# Organize predictions into a DataFrame
predicted_ratings = pd.DataFrame([(pred.uid, pred.iid, pred.r_ui, pred.est) for pred in predictions],
                                 columns=['User ID', 'Product ID', 'Actual Rating', 'Estimated Rating'])
predicted_ratings['Error'] = abs(predicted_ratings['Actual Rating'] - predicted_ratings['Estimated Rating'])

# Display the results
predicted_ratings.head(10)
```

	User ID	Product ID	Actual Rating	Estimated Rating	Error
0	AGRV2QBB6JEZZOFFU2SXQ6MD4FKQ,AE63YMXM3DHXLPTNV...	B0BP18W8TM	4.4	5	0.6
1	AE35OI7LDTOKU32IFQ3GQX5AOKFQ,AHT5CRFFKABTHYW4E...	B07KR5P3YD	3.9	5	1.1
2	AH2MRKVSHAWAMAXALBY6VSDCFMSA,AFF7763EFPZ7EQUC3...	B078V8R9BS	4.2	5	0.8
3	AHEVOQADJSSRX7DS325HSFLMP7VQ,AG7XYZRCSKX6G2OLO...	B0B6F7LX4C	4.2	5	0.8
4	AE3PTJFRVU3YM5YFYN3ICDA5X6FA,AGF5DMXE65QXZPJX6...	B015ZXUDD0	4.3	5	0.7
5	AEZPNXZLF5U7XEX6TOW3J56C3XDA,AGG3ECGCIKNPZJEVJ...	B0819ZZK5K	4.3	5	0.7
6	AFJ4ZH2VBT7VFHQNRMCEX2L2LBUA,AFFPHN5H4FO3XR2OZ...	B09TP5KBN7	4.0	5	1.0
7	AGXE6V4HYRRDGH33H3NE7PGF4D4Q,AFDW67WRZ2IJI7LQQ...	B07TR5HSR9	4.3	5	0.7
8	AH3DPBR7M2QD4UAT3SOYSFP4WTAQ,AH7YF74D552LEEDO6...	B0BMVWKZ8G	4.3	5	0.7
9	AEDOY7QSF22AYSFDSBF32NURIY3A,AE4GETIZXRFI5D7IX...	B07GLSKXS1	3.9	5	1.1

```
Start coding or generate with AI.
```