```python
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
%matplotlib inline
import seaborn as sns
```

```python
np.arange(1,10)
```

```
array([1, 2, 3, 4, 5, 6, 7, 8, 9])
```

```python
x=np.arange(0,4*np.pi,0.1)
x
```

```
array([ 0. ,  0.1,  0.2,  0.3,  0.4,  0.5,  0.6,  0.7,  0.8,  0.9,  1. ,
        1.1,  1.2,  1.3,  1.4,  1.5,  1.6,  1.7,  1.8,  1.9,  2. ,  2.1,
        2.2,  2.3,  2.4,  2.5,  2.6,  2.7,  2.8,  2.9,  3. ,  3.1,  3.2,
        3.3,  3.4,  3.5,  3.6,  3.7,  3.8,  3.9,  4. ,  4.1,  4.2,  4.3,
        4.4,  4.5,  4.6,  4.7,  4.8,  4.9,  5. ,  5.1,  5.2,  5.3,  5.4,
        5.5,  5.6,  5.7,  5.8,  5.9,  6. ,  6.1,  6.2,  6.3,  6.4,  6.5,
        6.6,  6.7,  6.8,  6.9,  7. ,  7.1,  7.2,  7.3,  7.4,  7.5,  7.6,
        7.7,  7.8,  7.9,  8. ,  8.1,  8.2,  8.3,  8.4,  8.5,  8.6,  8.7,
        8.8,  8.9,  9. ,  9.1,  9.2,  9.3,  9.4,  9.5,  9.6,  9.7,  9.8,
        9.9, 10. , 10.1, 10.2, 10.3, 10.4, 10.5, 10.6, 10.7, 10.8, 10.9,
       11. , 11.1, 11.2, 11.3, 11.4, 11.5, 11.6, 11.7, 11.8, 11.9, 12. ,
       12.1, 12.2, 12.3, 12.4, 12.5])
```

```python
y=np.sin(x)
y
```

```
array([ 0.        ,  0.09983342,  0.19866933,  0.29552021,  0.38941834,
        0.47942554,  0.56464247,  0.64421769,  0.71735609,  0.78332691,
        0.84147098,  0.89120736,  0.93203909,  0.96355819,  0.98544973,
        0.99749499,  0.9995736 ,  0.99166481,  0.97384763,  0.94630009,
```

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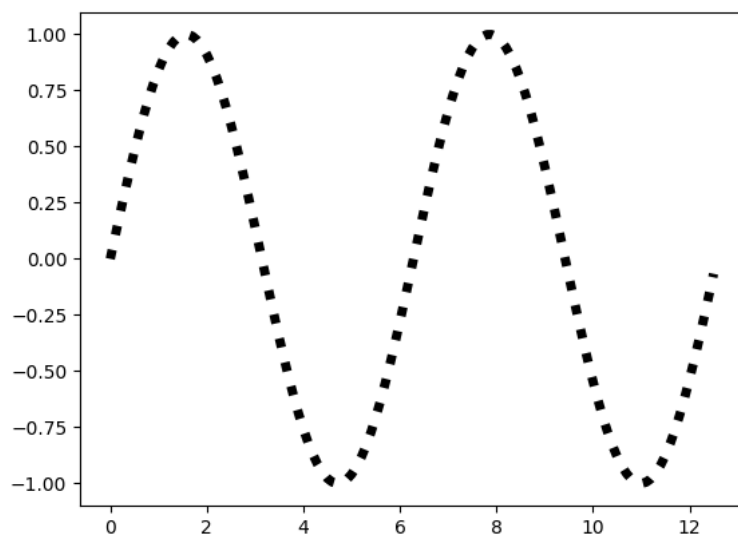
```
        0.14112001,  0.04158066, -0.05837414, -0.15774569, -0.2555411 ,
       -0.35078323, -0.44252044, -0.52983614, -0.61185789, -0.68776616,
       -0.7568025 , -0.81827711, -0.87157577, -0.91616594, -0.95160207,
       -0.97753012, -0.993691  , -0.99992326, -0.99616461, -0.98245261,
       -0.95892427, -0.92581468, -0.88345466, -0.83226744, -0.77276449,
       -0.70554033, -0.63126664, -0.55068554, -0.46460218, -0.37387666,
       -0.2794155 , -0.1821625 , -0.0830894 ,  0.0168139 ,  0.1165492 ,
        0.21511999,  0.31154136,  0.40484992,  0.49411335,  0.57843976,
        0.6569866 ,  0.72896904,  0.79366786,  0.85043662,  0.8987081 ,
        0.93799998,  0.96791967,  0.98816823,  0.99854335,  0.99894134,
        0.98935825,  0.96988981,  0.94073056,  0.90217183,  0.85459891,
        0.79848711,  0.7343971 ,  0.66296923,  0.58491719,  0.50102086,
        0.41211849,  0.31909836,  0.22288991,  0.12445442,  0.02477543,
       -0.07515112, -0.17432678, -0.27176063, -0.36647913, -0.45753589,
       -0.54402111, -0.62507065, -0.69987469, -0.76768581, -0.82782647,
       -0.87969576, -0.92277542, -0.95663502, -0.98093623, -0.99543625,
       -0.99999021, -0.99455259, -0.97917773, -0.95401925, -0.91932853,
       -0.87545217, -0.82282859, -0.76198358, -0.69352508, -0.61813711,
       -0.53657292, -0.44964746, -0.35822928, -0.26323179, -0.16560418,
       -0.0663219 ])
```
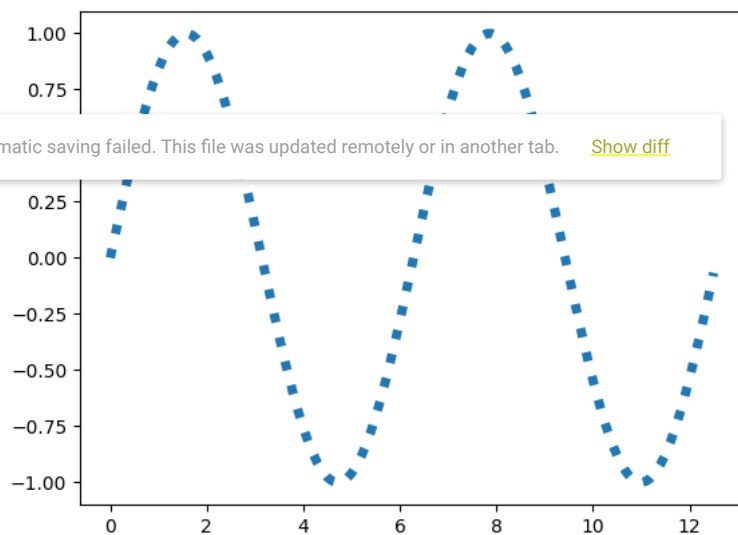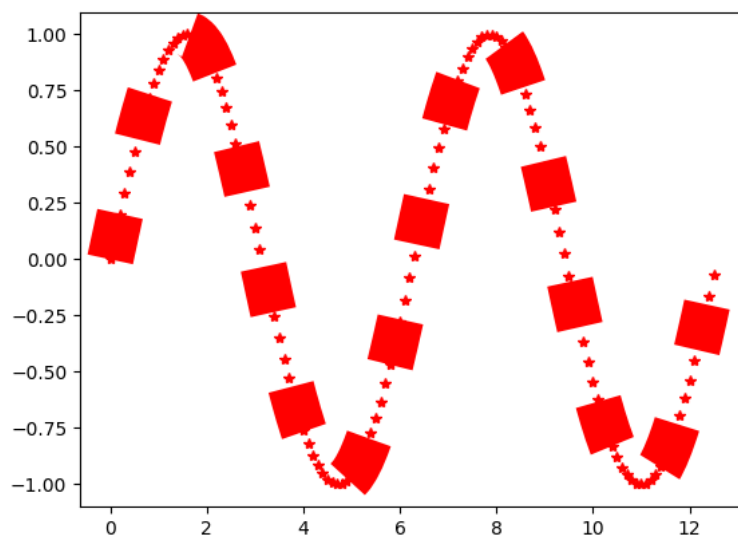
```python
plt.plot(x,y)
plt.show()
```
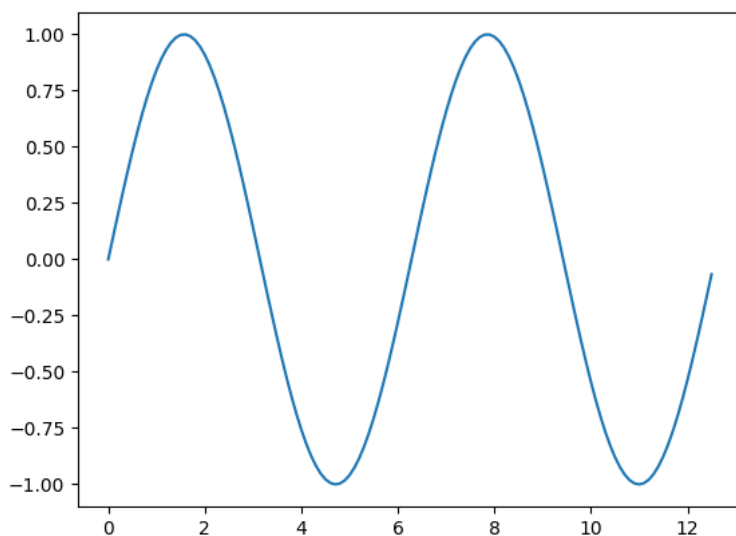
```python
plt.plot(x,y, linewidth=5, linestyle=":", color="black")
plt.show()
```
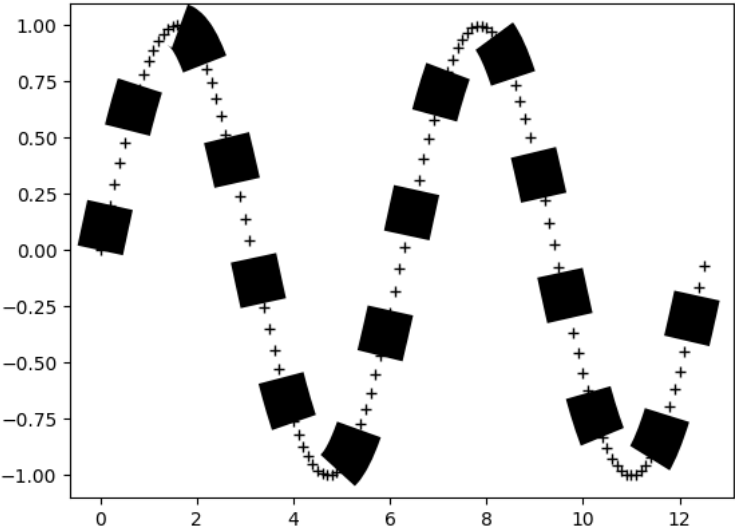


```python
plt.plot(x,y, linewidth=5, linestyle=":")
plt.show()
```


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```python
plt.plot(x,y, linewidth=25, linestyle=":",marker="*",color="red")
plt.show()
```



```python
plt.plot(x,y, linewidth=25, linestyle=":",marker="+",color="black")
plt.show()
```

```
df=pd.read_csv('exams.csv')
df
```

	gender	race/ethnicity	parental level of education	lunch	test preparation course	math score	reading score	wri s
0	male	group A	high school	standard	completed	67	67	
1	female	group D	some high school	free/reduced	none	40	59	
							60	
3	male	group B	high school	standard	none	77	78	
4	male	group E	associate's degree	standard	completed	78	73	
...	...	...	...	...	...	...	...	
995	male	group C	high school	standard	none	73	70	

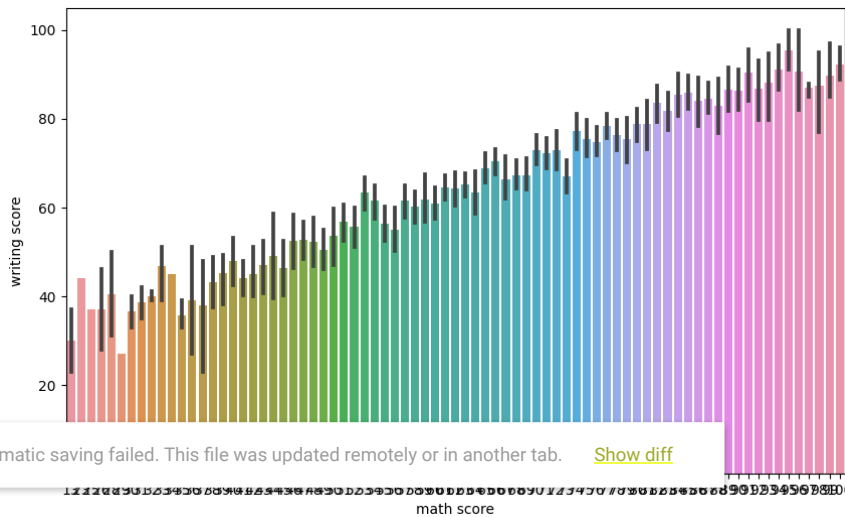Automatic saving failed. This file was updated remotely or in another tab.   Show diff

```
df.head()
```

|	gender	race/ethnicity	parental level of education	lunch	test preparation course	math score	reading score	writi sco
0	male	group A	high school	standard	completed	67	67	
1	female	group D	some high school	free/reduced	none	40	59	

```
plt.figure(figsize=(10,6))
sns.scatterplot(data=df, x='math score', y='reading score')
plt.show()
```
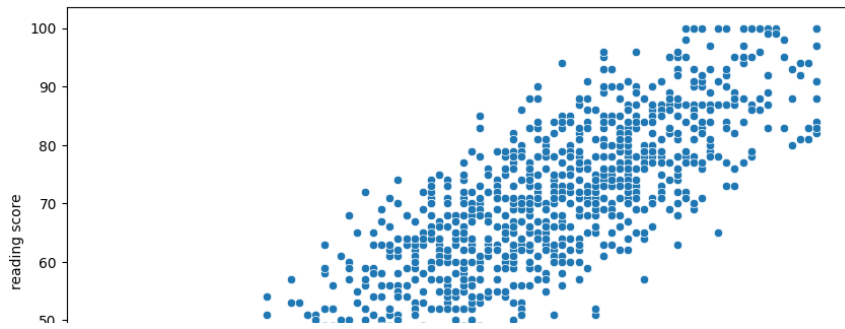
```
plt.figure(figsize=(10,6))
sns.barplot(data=df,x='math score',y='writing score')
plt.show()
```


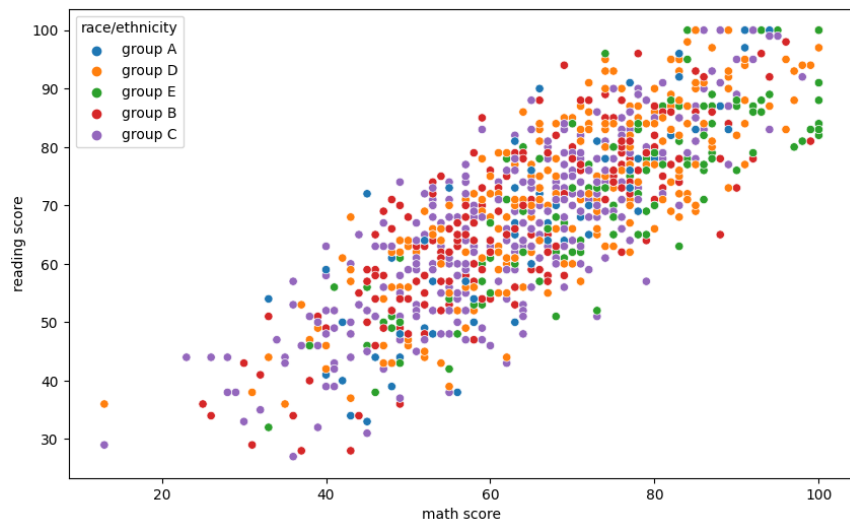Automatic saving failed. This file was updated remotely or in another tab.   Show diff

```
plt.figure(figsize=(10,6))
sns.scatterplot(data=df, x=df['math score'], y=df['reading score'], hue="parental level of education")
plt.show()
```
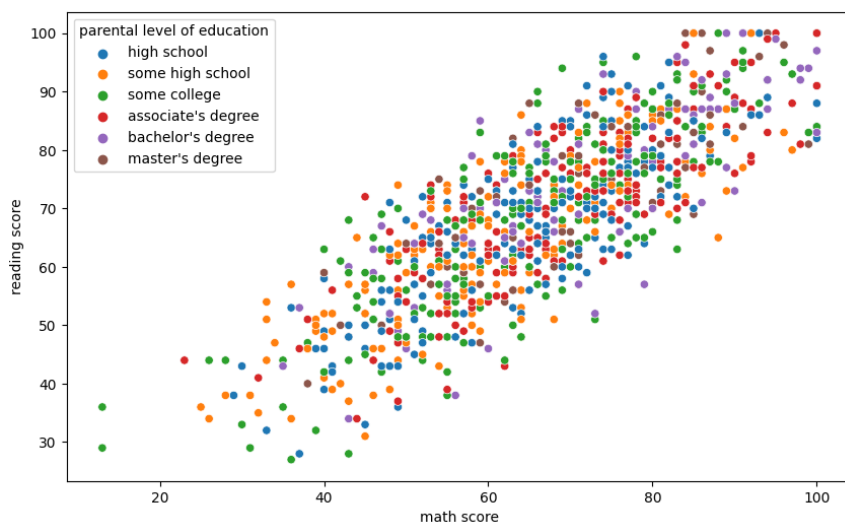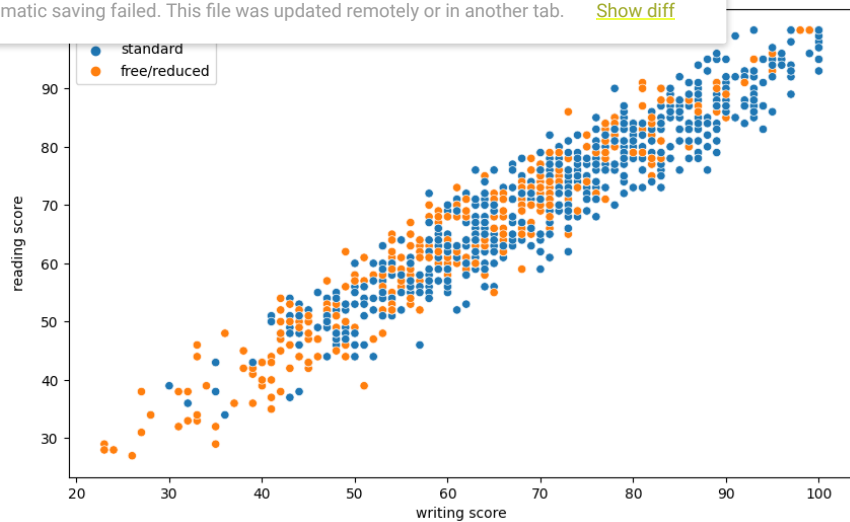


```
plt.figure(figsize=(10,6))
sns.scatterplot(data=df, x=df['math score'], y=df['reading score'], hue="race/ethnicity")
```

```
plt.show()
```



```
plt.figure(figsize=(10,6))
sns.scatterplot(data=df, x=df['writing score'], y=df['reading score'], hue="lunch")
plt.show()
```

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