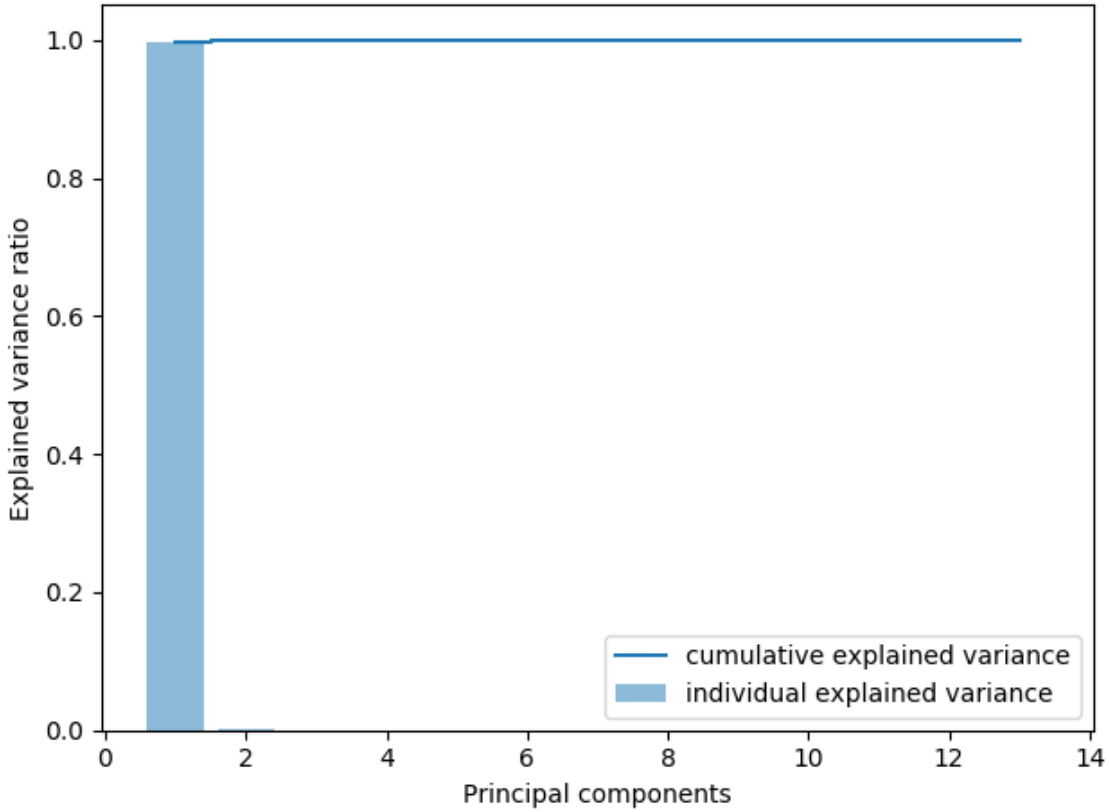
- Split the wine dataset into training and test sets:
  - The ratio of training and test set is 7:3 using random_state=0 for dataset splitting.
  - That is, execute "np.random.seed(0)" before splitting the dataset.
- Based on the wine dataset, complete the next two tasks, A and B.

A. Use PCA to perform 'feature transformation' on the **non-standardized** training dataset. Then draw the "explained variance" plot as follows:



Recall that with standardized training dataset, the first three principal components (transformed features) account for about 70% of the total variance as shown in the textbook.

Q: The result of the above figure shows that the first feature of the un-standardized training dataset accounts for **all the total variance**. Please explain **why**?

B. According to the following four different feature settings, separately train the logistic regression classifier. Based on the test dataset, calculate the accuracy for each setting.

Feature setting	Feature Dimension used	Accuracy
Use all the 13 original features without standardization	13	?
Use all the 13 standardized features	13	?
After PCA transformation on **non-standardized** dataset, use the first three new features	3	?
After PCA transformation on **standardized** dataset, use the first three new features	3	?

- For the above four feature settings, **which one** gives the worst accuracy on the test dataset?
- Also explain **why?**