**Sample student answer**:

1. How many columns are in the dataset deadwood?
   1. 260
2. View the dataset deadwood, how many fungal species are there? (Hint: subtract non-species columns from the total number of columns).
   1. 260-11=249
3. How many rows are in the dataset deadwood?
   1. 16
4. How many localities (field sites) are in the dataset? (Hint: check the rows).
   1. 16
5. How many dimensions were used? What was the stress level?
   1. 2; 0.106
6. Is the stress level acceptable?
   1. yes
7. How is the non-metric fit (R squared)? This is what we are interested in. Do the blue points follow the line closely?
   1. 0.989, yes, points follow the line closely enough.
8. What do you think cex command does?
   1. Changes the diameter of points.
9. Do the pine (green hull) and the hardwood forest (brown hull) overlap?
   1. No, they do not
10. Do either of the factors (latitude, longitude) have a significant p value (Pr)? What does it tell us about the correlation between the factor and NMDS axes?
    1. Latitude has a significant p-value. It should correlate with NMDS values.
11. Which type of communities tend to be found with higher latitudes? Which are found at lower latitudes?
    1. Hardwood communities are found on the North, pine barrens are found on the South.
12. Write the names for the three species you selected.
    1. Multiclavia mucida, Mycena sp., Phaeocalicium polyporaeum.
13. Take a screenshot of your complete zoomed in NMDS (or save as TIFF) and insert here:
14. Fill in the table:

|  |  |  |
| --- | --- | --- |
| **Species name** | **Parks (sites) found** | **Hardwood or pine barrens?** |
| Multiclavia mucida | Forest Resource education center, Brendan T. Byrne State Park | Pine barrens |
| Mycena sp. | Ocean county park, Rancocas State Park, Franklin Parker Reserve, Belleplain State Forest | Pine barrens |
| Phaeocalicium polyporaeum | Stephens State Park, Meadowood Park, Schiff Nature Preserve | Hardwood |

1. Can you spot a relationship between where the species is found and the position of the red cross representing this species in your NMDS graph? Please explain. Provide one example using a species from the Table above.
   1. Yes, hardwood fungi species are located close to the green hull enclosing hardwood communities, and softwood species are found in the brown hull for pine barrens.
2. What can you say about the specificity of dead wood fungal communities? Is there a difference between communities in hardwood vs pine forests?
   1. It is apparent from the plot that dead wood fungal communities are different in hardwood vs softwood forests. This may be explained by the different chemical composition of the wood thus requiring different enzymatic activities in fungal species.