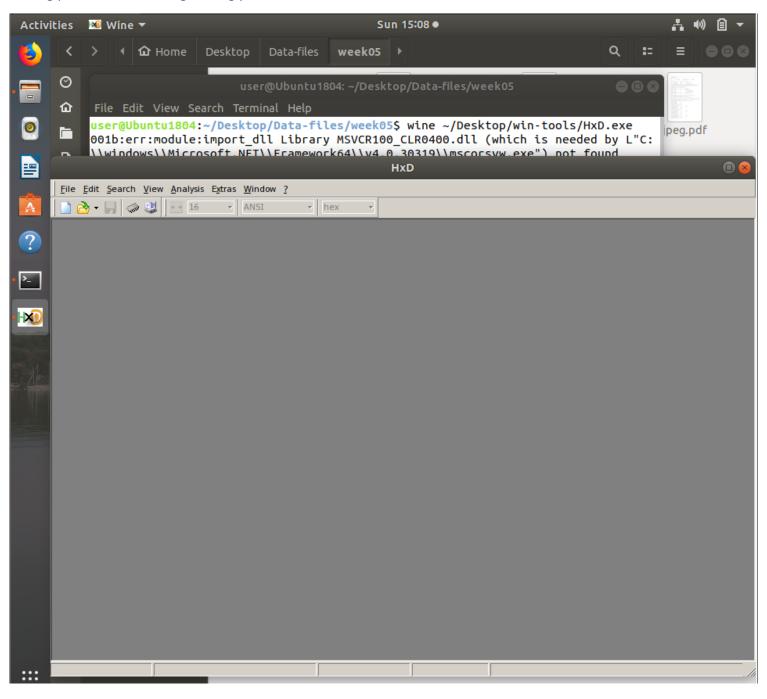
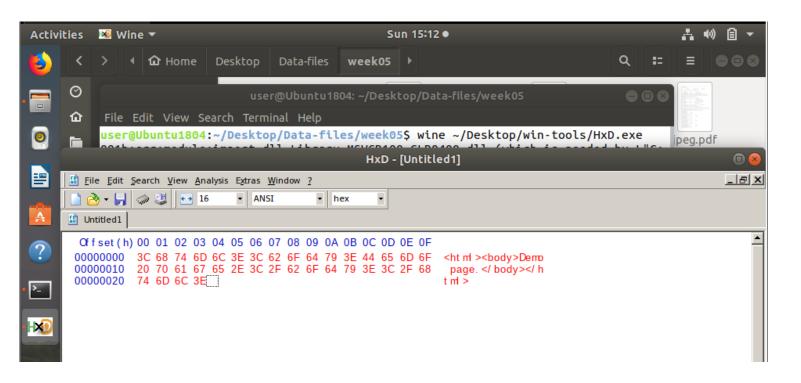
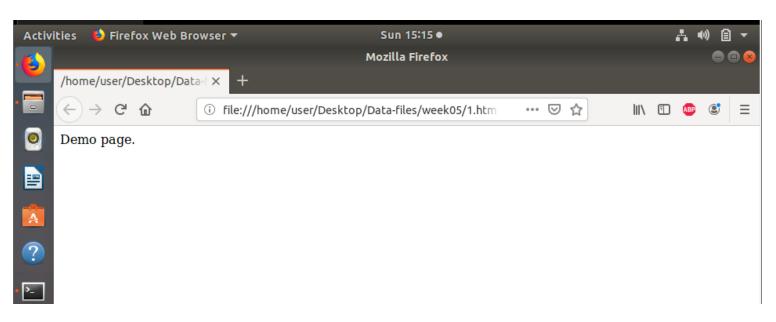
## **Manipulating Data by Using HxD**

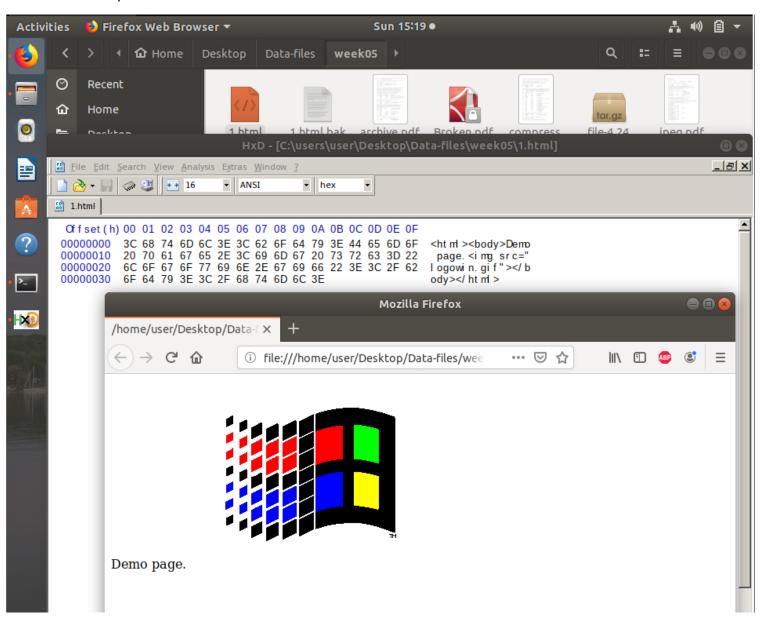
Using the Ubuntu environment's "wine" emulator, I first launched the HxD Hex Editor. I worked on fundamental hex editor functions like creating, inserting, overwriting, copying, and pasting data. I entered an example HTML string into a new document and saved it as "1.html" in order to better understand the differences between the hex editing panel and the string editing panel.

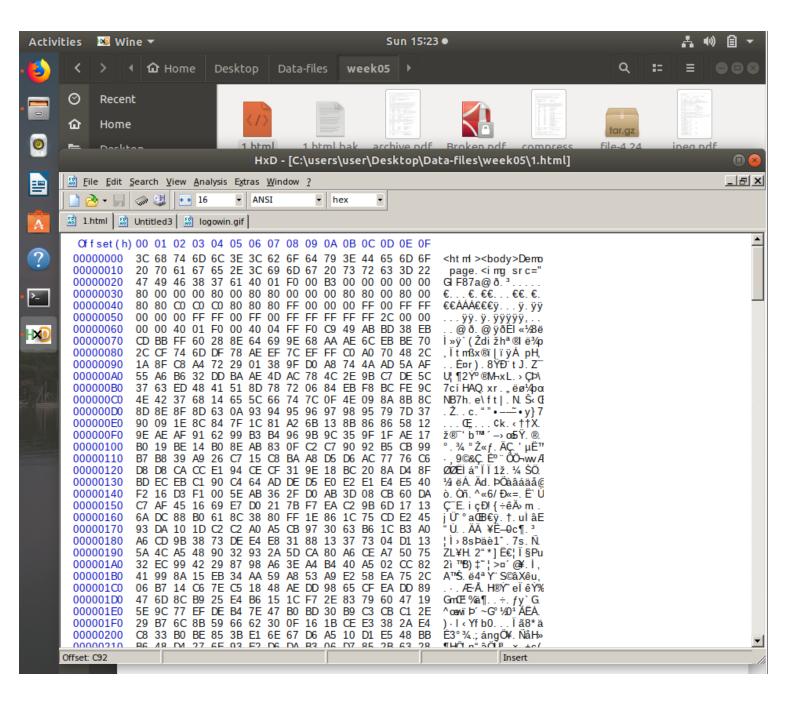


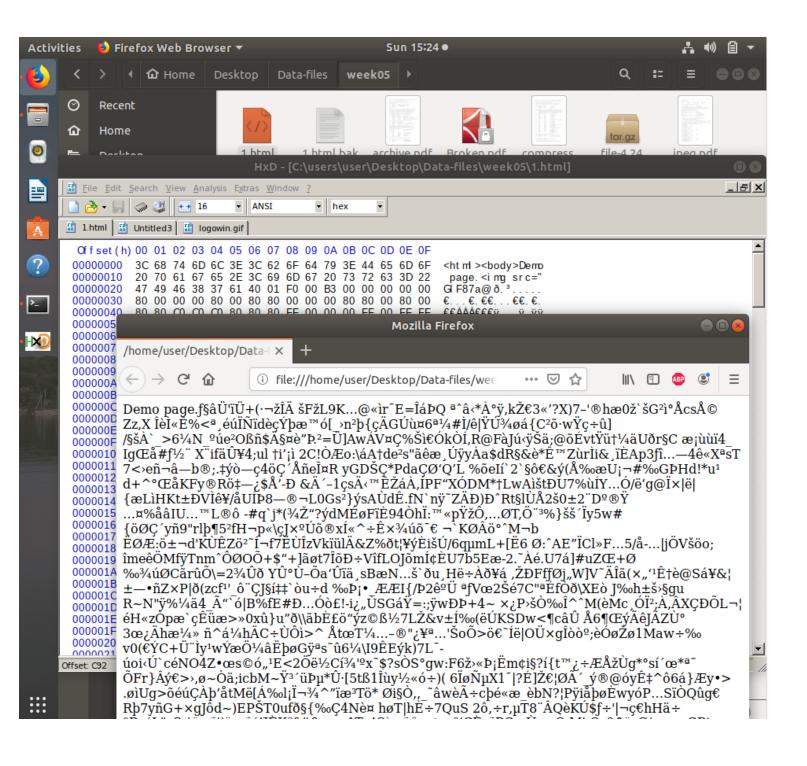




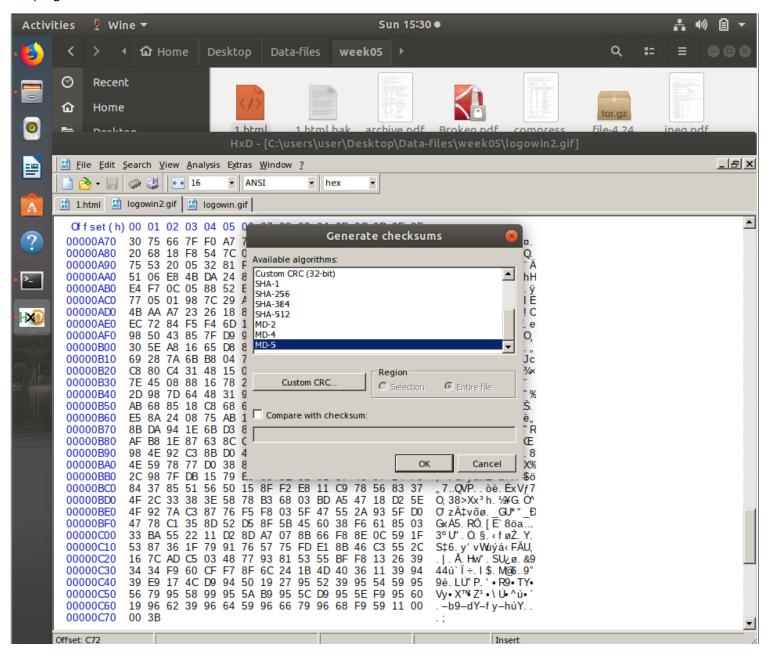
I then discovered how to incorporate a picture into an HTML document. At first, I used the HTML code itself to directly reference the image file "logowin.gif". Next, I experimented with a more sophisticated technique that involved directly integrating the image's binary content into the HTML file. I copied the whole contents of "logowin.gif" and pasted it into "1.html" after opening the file in HxD. This exercise demonstrated how raw binary data can be incorporated into different file formats.

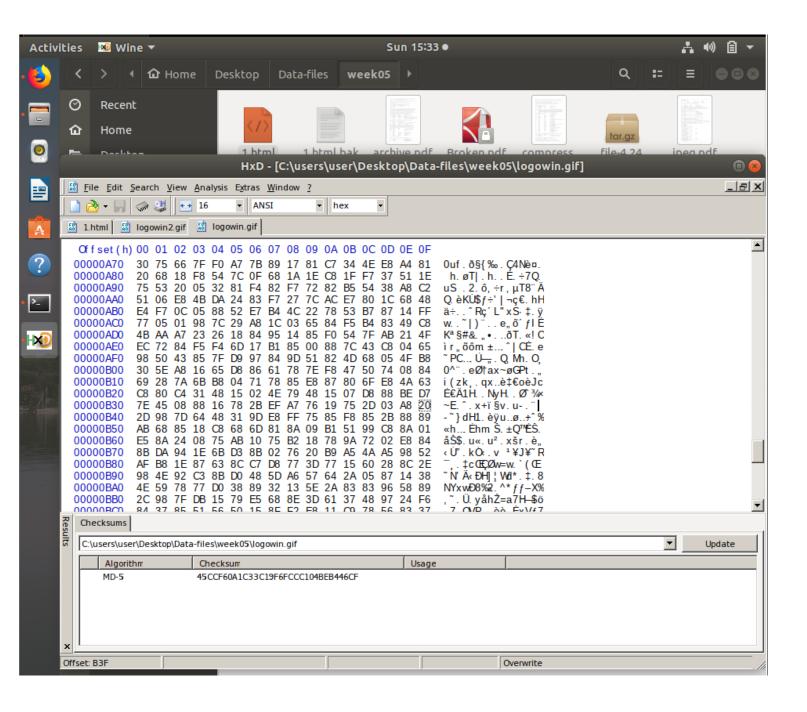


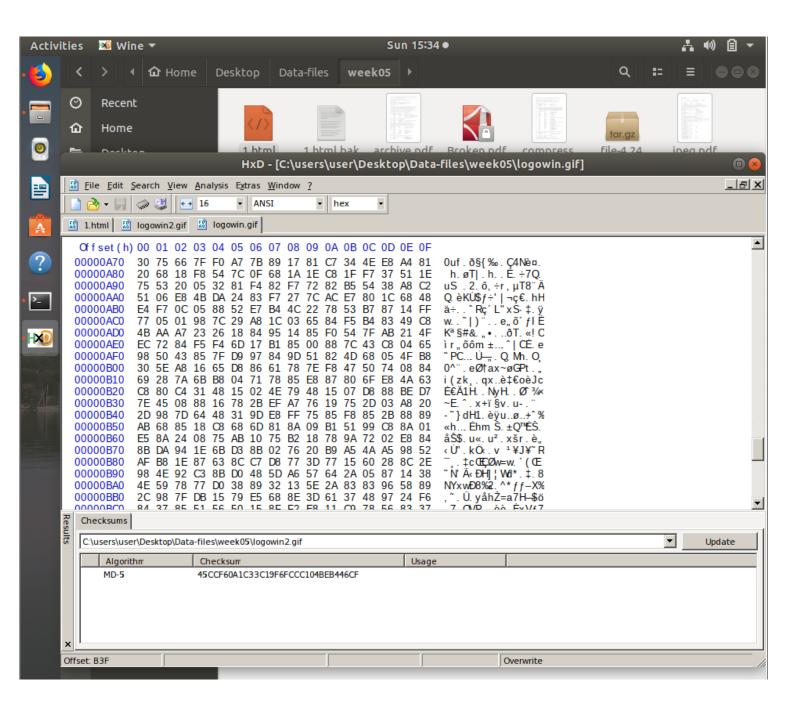




Then I switched to the "1.html" file in the HxD editor. Selected the content that I just pasted, cut the highlighted content, and saved it in a separate file. The newly saved file (e.g. logowin2.gif) should be the same as the original file "logowin.gif". I used the program md5sum to validate the result.

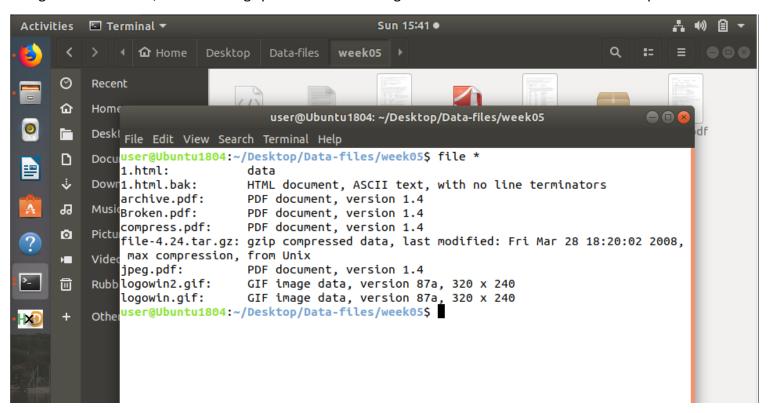


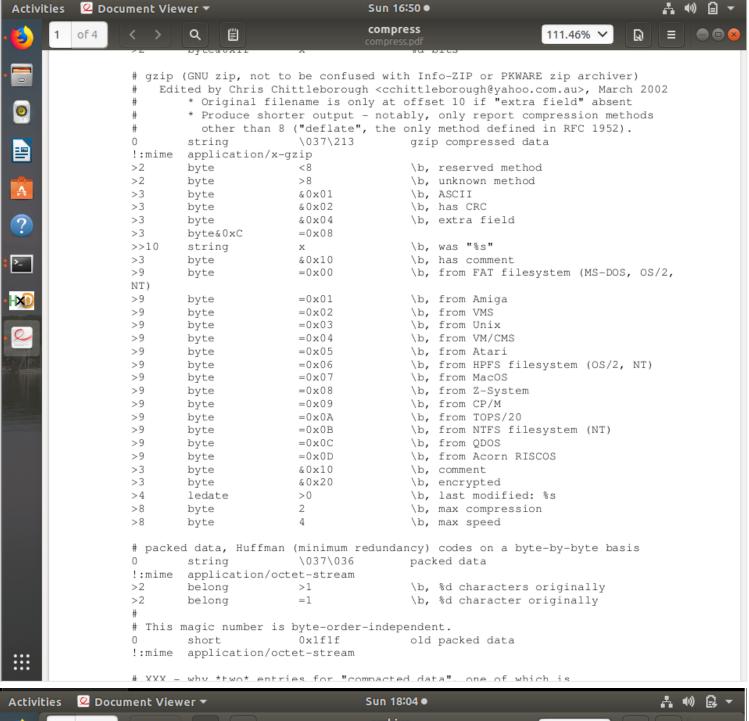


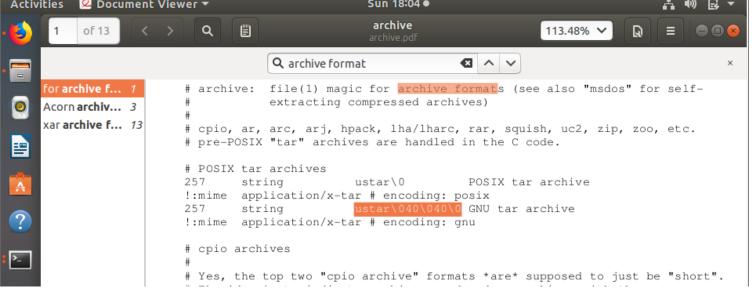


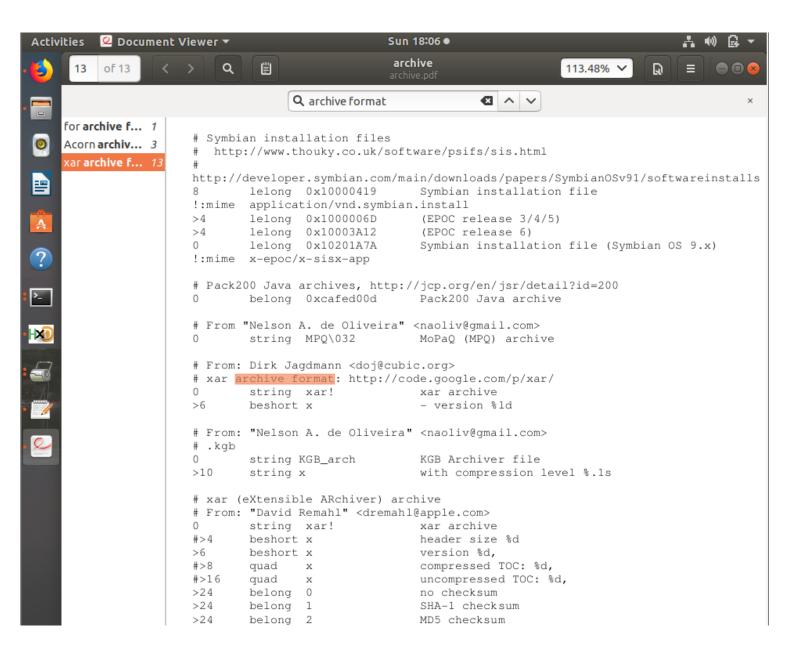
## Introducing the Linux tool file

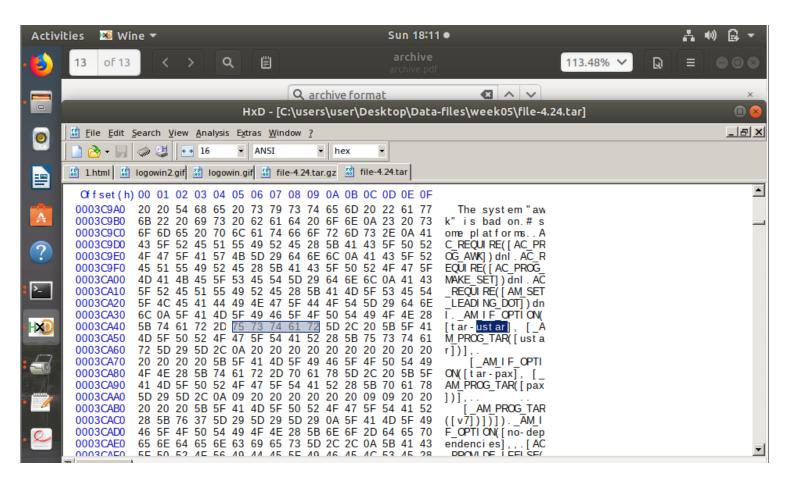
After that, I was able to identify different file types using their magic numbers by using the Linux utility "file". Through header analysis, this tool assisted in identifying the appropriate programs to open different types of files. Using this information, I looked at a gzip file and saw its magic number in hexadecimal and octal representations.











## **Repairing Broken File Headers**

Lastly, the task included fixing a file header that was broken. After using HxD to examine the file more closely, we discovered that it was actually a JPEG file with an Exif header that was mistakenly classified as a PDF. By utilizing the hex editor to swap out the wrong PDF header with the correct JPEG header, I was able to save the altered file as "Broken.jpg" and successfully restore the image.

