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Question 1: Explain this following bash script:

```
#!/bin/bash
space_free=$( df -h | awk '{ print $5 }' | sort -n | tail -n 1 | sed 's/%//' )
case $space_free in
[1-5]*)
      echo Plenty of disk space available
;;
[6-7]*)
echo There could be a problem in the near future
;;
8*)
    echo Maybe we should look at clearing out old files
 ;;
9*)
     echo We could have a serious problem on our hands soon
;;
*)
    echo Something is not quite right here
   ;;
Esac
```

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Ans:

This bash script is used to check the amount of free disk space on a system and output a message based on the amount of free space.

The script first uses the df command to display information about the file systems on the system, and the awk command to extract the fifth column, which contains the percentage of used space. The output is then sorted numerically and the last line (which will contain the highest percentage of used space) is displayed using tail. The sed command is used to remove the percent sign from the output.

The value of the free space percentage is then stored in the space_free variable.

The script then uses a case statement to evaluate the value of space_free and output a message based on the range of the value. The case statement checks for values in the following ranges:

[1-5]*: If the value of space_free is between 1 and 5 (inclusive), the script outputs the message "Plenty of disk space available".

[6-7]*: If the value of space_free is between 6 and 7 (inclusive), the script outputs the message "There could be a problem in the near future".

8*: If the value of space_free is 8 or higher, the script outputs the message "Maybe we should look at clearing out old files".

9*: If the value of space_free is 9 or higher, the script outputs the message "We could have a serious problem on our hands soon".

*: If the value of space_free does not match any of the previous patterns, the script outputs the message "Something is not quite right here".

The script uses the ;; symbol to indicate the end of each case.

Overall, this script can be used to monitor the amount of free disk space on a system and provide alerts if the amount of free space falls below certain thresholds.