Pattern and String Substitution Cheatsheet

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| **String Operations** | |
| ${VAR#pattern} | Remove from beginning to the FIRST occurrence of the match |
| ${VAR##pattern} | Remove from beginning to the LAST occurrence of the match |
| ${VAR%pattern} | Remove from the EOL to the FIRST occurrence of the match |
| ${VAR%%pattern} | Remove from the EOL to the LAST occurrence of the match |
| ${VAR/pattern/string} | Replace matching pattern with string |
| ${VAR/#pattern/string} | Replace matching pattern at the BEGINNING of the line with string |
| ${VAR/%pattern/string} | Replace matching pattern at the END of the line with string |
| ${VAR//pattern/string} | Replace ALL matching occurrences of pattern with string |
| ${VAR:offset:length} | Returns the substring of $VAR starting at offset to the length of characters |
| ${VAR: -length} | Returns the substring of $VAR starting at offset from the END |
| **Variable Manipulations** | |
| ${#VAR} | Get length of variable |
| ${!pattern\*} | Indirect reference - matches all variables names that match the pattern |
| ${VAR^} | Transform first character of string to uppercase |
| ${VAR^^} | Transform all characters of string to uppercase |
| ${VAR,} | Transform first character of string to lowercase |
| ${VAR,,} | Transform all characters of string to lowercase |
| **Expansions to handle empty variables** | |
| ${VAR:-$VAR2} | If $VAR isn't null return it's value, else return $VAR2 |
| ${VAR:=$VAR2} | If $VAR isn't null return it's value, else assign it to $VAR2 and return it's value |
| ${VAR:?$VAR2} | If $VAR isn't null return it's value, otherwise print VAR: $VAR2 and abort |
| ${VAR:+$VAR2} | If $VAR isn't null, return $VAR2 otherwise return null |

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| **String Operations Examples** | |
| VAR="The quick brown fox jumped over the fox" | |
| echo ${VAR#\*fox} | jumped over the fox |
| echo ${VAR%fox\*} | The quick brown fox jumped over the |
| echo ${VAR%%fox\*} | The quick brown |
| echo ${VAR/fox/dog} | The quick brown dog jumped over the fox |
| echo ${VAR//fox/dog} | The quick brown dog jumped over the dog |
| echo ${VAR/#The/A} | A quick brown fox jumped over the fox |
| ${VAR/%fox/dog} | The quick brown fox jumped over the dog |