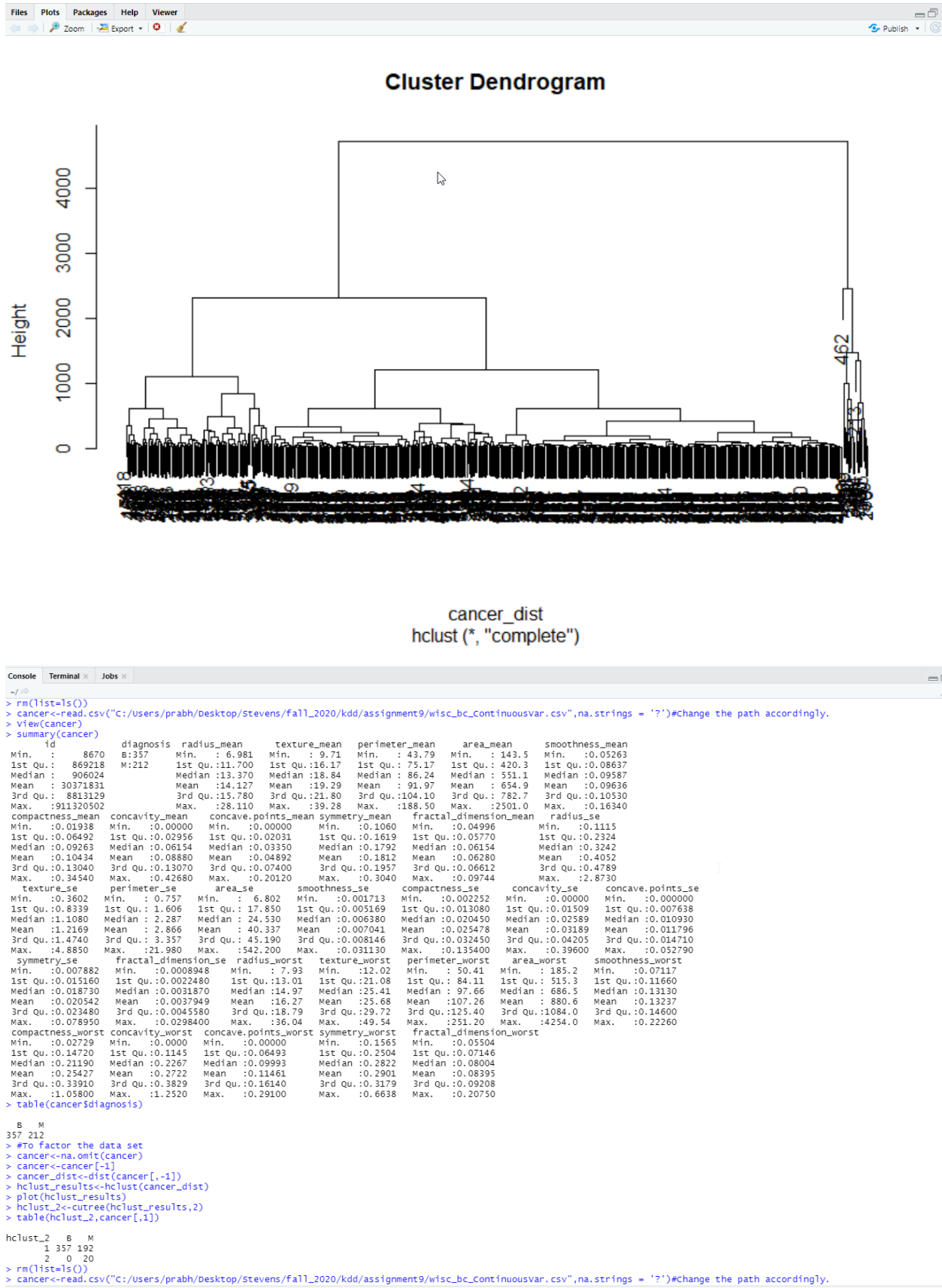


## Assignment 9



## Assignment 9

```
> View(cancer)
> summary(cancer)
      id      diagnosis  radius_mean  texture_mean  perimeter_mean  area_mean  smoothness_mean
Min.   :    8670      B:357      Min.   : 6.981      Min.   : 9.71      Min.   : 43.79      Min.   : 143.5      Min.   : 0.05263
1st Qu.:  869218      M:212      1st Qu.:11.700      1st Qu.:16.17      1st Qu.: 75.17      1st Qu.: 420.3      1st Qu.: 0.08637
Median :  906024                        Median :13.370      Median :18.84      Median : 86.24      Median : 551.1      Median : 0.09587
Mean   : 30371831                        Mean   :14.127      Mean   :19.29      Mean   : 91.97      Mean   : 654.9      Mean   : 0.09636
3rd Qu.:  8813129                        3rd Qu.:15.780      3rd Qu.:21.80      3rd Qu.:104.10      3rd Qu.: 782.7      3rd Qu.: 0.10530
Max.   :911320502                        Max.   :28.110      Max.   :39.28      Max.   :188.50      Max.   :2501.0      Max.   :0.16340

compactness_mean  concavity_mean  concave.points_mean  symmetry_mean  fractal_dimension_mean  radius_se
Min.   :0.01938      Min.   :0.00000      Min.   :0.00000      Min.   :0.1060      Min.   :0.04996      Min.   :0.1115
1st Qu.:0.06492      1st Qu.:0.02956      1st Qu.:0.02031      1st Qu.:0.1619      1st Qu.:0.05770      1st Qu.:0.2324
Median :0.09263      Median :0.06154      Median :0.03350      Median :0.1792      Median :0.06154      Median :0.3242
Mean   :0.10434      Mean   :0.08880      Mean   :0.04892      Mean   :0.1812      Mean   :0.06280      Mean   :0.4052
3rd Qu.:0.13040      3rd Qu.:0.13070      3rd Qu.:0.07400      3rd Qu.:0.1957      3rd Qu.:0.06612      3rd Qu.:0.4789
Max.   :0.34540      Max.   :0.42680      Max.   :0.20120      Max.   :0.3040      Max.   :0.09744      Max.   :2.8730

texture_se  perimeter_se  area_se  smoothness_se  compactness_se  concavity_se
Min.   :0.3602      Min.   :0.757      Min.   : 6.802      Min.   :0.001713      Min.   :0.002252      Min.   :0.00000
1st Qu.:0.8339      1st Qu.: 1.606      1st Qu.:17.850      1st Qu.:0.005169      1st Qu.:0.013080      1st Qu.:0.01509
Median :1.1080      Median : 2.287      Median :24.530      Median :0.006380      Median :0.020450      Median :0.02589
Mean   :1.2169      Mean   : 2.866      Mean   :40.337      Mean   :0.007041      Mean   :0.025478      Mean   :0.03189
3rd Qu.:1.4740      3rd Qu.: 3.357      3rd Qu.:45.190      3rd Qu.:0.008146      3rd Qu.:0.032450      3rd Qu.:0.04205
Max.   :4.8850      Max.   :21.980      Max.   :542.200      Max.   :0.031130      Max.   :0.135400      Max.   :0.39600

concave.points_se  symmetry_se  fractal_dimension_se  radius_worst  texture_worst  perimeter_worst
Min.   :0.000000      Min.   :0.007882      Min.   :0.0008948      Min.   : 7.93      Min.   :12.02      Min.   : 50.41
1st Qu.:0.007638      1st Qu.:0.015160      1st Qu.:0.0022480      1st Qu.:13.01      1st Qu.:21.08      1st Qu.: 84.11
Median :0.010930      Median :0.018730      Median :0.0031870      Median :14.97      Median :25.41      Median : 97.66
Mean   :0.011796      Mean   :0.020542      Mean   :0.0037949      Mean   :16.27      Mean   :25.68      Mean   :107.26
3rd Qu.:0.014710      3rd Qu.:0.023480      3rd Qu.:0.0045580      3rd Qu.:18.79      3rd Qu.:29.72      3rd Qu.:125.40
Max.   :0.052790      Max.   :0.078950      Max.   :0.0298400      Max.   :36.04      Max.   :49.54      Max.   :251.20

area_worst  smoothness_worst  compactness_worst  concavity_worst  concave.points_worst  symmetry_worst
Min.   :185.2      Min.   :0.07117      Min.   :0.02729      Min.   :0.0000      Min.   :0.00000      Min.   :0.1565
1st Qu.:515.3      1st Qu.:0.11660      1st Qu.:0.14720      1st Qu.:0.1145      1st Qu.:0.06493      1st Qu.:0.2504
Median :686.5      Median :0.13130      Median :0.21190      Median :0.2267      Median :0.09993      Median :0.2822
Mean   :880.6      Mean   :0.13237      Mean   :0.25427      Mean   :0.2722      Mean   :0.11461      Mean   :0.2901
3rd Qu.:1084.0      3rd Qu.:0.14600      3rd Qu.:0.33910      3rd Qu.:0.3829      3rd Qu.:0.16140      3rd Qu.:0.3179
Max.   :14254.0      Max.   :0.22260      Max.   :1.05800      Max.   :1.2520      Max.   :0.29100      Max.   :0.6638

fractal_dimension_worst
Min.   :0.05504
1st Qu.:0.07146
Median :0.08004
Mean   :0.08395
3rd Qu.:0.09208
Max.   :0.20750

> table(cancer$diagnosis)
  B  M
357 212

> #To factor the data set
> cancer<-na.omit(cancer)
> cancer<-cancer[1,]
> kmeans_2<- kmeans(cancer[,-1],2,nstart = 10)
> kmeans_2$cluster
 1  2  3  4  5  6  7  8  9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1
2  32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62
2  2  1  1  1  1  2  2  2  2  2  2  1  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2
63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93
2  2  2  2  2  2  2  2  2  2  2  1  2  2  2  1  2  2  2  2  2  1  1  2  1  2  1  2  2  2  2
94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124
2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2
125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155
2  2  2  2  1  2  1  2  1  2  2  2  2  2  2  2  2  2  1  2  2  2  2  2  2  2  2  2  2  2  2  2
156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186
2  1  2  2  2  2  2  2  1  1  2  2  1  2  2  2  2  2  2  2  2  2  2  2  2  2  1  1  1  2  2  2
187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217
1  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  1  2  1  2  2  2  2
218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248
2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2
249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279
2  2  2  1  2  1  1  1  2  1  2  1  2  2  1  1  1  2  2  2  2  2  2  2  2  2  1  2  1  2  2  1  2
280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310
2  1  2  1  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  1  2  2  2  2  2  2
311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341
2  2  2  2  2  2  2  2  1  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  1  2  1  2  2  1  2
342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372
2  2  1  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  1  1  2  1  2  2  2
373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403
1  1  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2
404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434
2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2
435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465
2  2  2  2  2  2  2  2  1  2  2  2  1  2  2  2  2  2  2  2  2  2  2  2  2  2  2  1  1  2  2  2
466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496
2  2  2  2  1  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  1  2  2  2  1  2  2  2
497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527
2  2  2  1  1  2  2  2  1  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  1  2  2  2  2  2  2
528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558
2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2
559 560 561 562 563 564 565 566 567 568 569
2  2  2  2  2  2  1  1  1  2  2  1  2

> table(kmeans_2$cluster,cancer[,1])
  B  M
1 130
2 356 82
>
```

## Assignment 9