

Lab 1

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DS| R for Analytics

Q1) 1. Populate vectors with the register numbers of students for the courses offered by the dept. of Data Science. Note: The four courses of the dept are - MSDS, MSEA, BSDS and BSEA

Q2) The total number of students in the courses are as follows: MSDS:62 MSEA:26 BSDS:37 BSEA:45

```
seq(2100101, 2100162, by=1) -> MSDS
seq(2100201, 2100226, by=1) -> MSEA
seq(2100301, 2100337, by=1) -> BSDS
seq(2100401, 2100445, by=1) -> BSEA

print("-----")
```

```
## [1] "-----"
```

```
print("MSDS Students:")
```

```
## [1] "MSDS Students:"
```

```
print("-----")
```

```
## [1] "-----"
```

```
cat("\n")
```

```
MSDS
```

```
## [1] 2100101 2100102 2100103 2100104 2100105 2100106 2100107 2100108 2100109  
## [10] 2100110 2100111 2100112 2100113 2100114 2100115 2100116 2100117 2100118  
## [19] 2100119 2100120 2100121 2100122 2100123 2100124 2100125 2100126 2100127  
## [28] 2100128 2100129 2100130 2100131 2100132 2100133 2100134 2100135 2100136  
## [37] 2100137 2100138 2100139 2100140 2100141 2100142 2100143 2100144 2100145  
## [46] 2100146 2100147 2100148 2100149 2100150 2100151 2100152 2100153 2100154  
## [55] 2100155 2100156 2100157 2100158 2100159 2100160 2100161 2100162
```

```
cat("\n")
```

```
print("-----")
```

```
## [1] "-----"
```

```
print("MSEA Students:")
```

```
## [1] "MSEA Students:"
```

```
print("-----")
```

```
## [1] "-----"
```

```
cat("\n")
```

```
MSEA
```

```
## [1] 2100201 2100202 2100203 2100204 2100205 2100206 2100207 2100208 2100209  
## [10] 2100210 2100211 2100212 2100213 2100214 2100215 2100216 2100217 2100218  
## [19] 2100219 2100220 2100221 2100222 2100223 2100224 2100225 2100226
```

```
cat("\n")
```

```
print("-----")
```

```
## [1] -----"
```

```
print("BSDS Students:")
```

```
## [1] "BSDS Students:"
```

```
print("-----")
```

```
## [1] -----"
```

```
cat("\n")
```

```
BSDS
```

```
## [1] 2100301 2100302 2100303 2100304 2100305 2100306 2100307 2100308 2100309  
## [10] 2100310 2100311 2100312 2100313 2100314 2100315 2100316 2100317 2100318  
## [19] 2100319 2100320 2100321 2100322 2100323 2100324 2100325 2100326 2100327  
## [28] 2100328 2100329 2100330 2100331 2100332 2100333 2100334 2100335 2100336  
## [37] 2100337
```

```
cat("\n")
```

```
print("-----")
```

```
## [1] -----"
```

```
print("BSEA Students:")
```

```
## [1] "BSEA Students:"  
  
print("-----")  
  
## [1] "-----"  
  
cat("\n")  
  
BSEA  
  
## [1] 2100401 2100402 2100403 2100404 2100405 2100406 2100407 2100408 2100409  
## [10] 2100410 2100411 2100412 2100413 2100414 2100415 2100416 2100417 2100418  
## [19] 2100419 2100420 2100421 2100422 2100423 2100424 2100425 2100426 2100427  
## [28] 2100428 2100429 2100430 2100431 2100432 2100433 2100434 2100435 2100436  
## [37] 2100437 2100438 2100439 2100440 2100441 2100442 2100443 2100444 2100445
```

Q3) The subjects for each programs are created as vectors: MSDS : (Python,Stochastic Analysis, Machine Learning, PDT) MSEA : (Microeconomics,Python,Macroeconomics,Research Methodology) BSDS:(Python,R for analytics,Statistics,Calculus) BSEA:(Statistics, Python, Calculus, Economics)

```
sub_MSDS <- c("Python", "Stochastic Analysis", "Machine Learning", "PDT")  
sub_MSEA <- c("Microeconomics", "Python", "Macroeconomics", "Research", "Methodology")  
sub_BSDS <- c("Python", "R for Analytics", "Statistics", "Calculus")  
sub_BSEA <- c("Statistics", "Python", "Calculus", "Economics")  
  
print("-----")  
  
## [1] "-----"  
  
print("MSDS Subjects:")  
  
## [1] "MSDS Subjects:"
```

```
print("-----")
## [1] "-----"
cat("\n")
sub_MSDS
## [1] "Python"          "Stochastic Analysis" "Machine Learning"
## [4] "PDT"
cat("\n")
print("-----")
## [1] "-----"
print("MSDS Subjects:")
## [1] "MSDS Subjects:"
print("-----")
## [1] "-----"
cat("\n")
sub_MSEA
```

```
## [1] "Microeconomics" "Python"           "Macroeconomics" "Research"  
## [5] "Methodology"
```

```
cat("\n")
```

```
print("-----")
```

```
## [1] "-----"
```

```
print("MSDS Subjects:")
```

```
## [1] "MSDS Subjects:"
```

```
print("-----")
```

```
## [1] "-----"
```

```
cat("\n")
```

```
sub_BSDS
```

```
## [1] "Python"          "R for Analytics" "Statistics"    "Calculus"
```

```
cat("\n")
```

```
print("-----")
```

```
## [1] "-----"
```

```
print("MSDS Subjects:")
## [1] "MSDS Subjects:

print("-----")
## [1] "-----"

cat("\n")

sub_BSEA

## [1] "Statistics" "Python"      "Calculus"     "Economics"

cat("\n")
```

Q4) Assign these subjects to each students of respective classes.

```
assign_MSDS <- rep(MSDS, each = 4)
assign_MSEA <- rep(MSEA, each = 4)
assign_BSDE <- rep(BSDE, each = 4)
assign_BSEA <- rep(BSEA, each = 4)

assignf_MSDS <- paste(assign_MSDS, sub_MSDS, sep = "-")
assignf_MSEA <- paste(assign_MSEA, sub_MSEA, sep = "-")
assignf_BSDE <- paste(assign_BSDE, sub_BSDE, sep = "-")
assignf_BSEA <- paste(assign_BSEA, sub_BSEA, sep = "-")

print("-----")
## [1] "-----"
```

```
print("Subjects per Student(MSDS):")
```

```
## [1] "Subjects per Student(MSDS):"
```

```
print("-----")
```

```
## [1] "-----"
```

```
cat("\n")
```

```
assignf_MSDS
```

```
## [1] "2100101-Python"           "2100101-Stochastic Analysis"
## [3] "2100101-Machine Learning" "2100101-PDT"
## [5] "2100102-Python"           "2100102-Stochastic Analysis"
## [7] "2100102-Machine Learning" "2100102-PDT"
## [9] "2100103-Python"           "2100103-Stochastic Analysis"
## [11] "2100103-Machine Learning" "2100103-PDT"
## [13] "2100104-Python"           "2100104-Stochastic Analysis"
## [15] "2100104-Machine Learning" "2100104-PDT"
## [17] "2100105-Python"           "2100105-Stochastic Analysis"
## [19] "2100105-Machine Learning" "2100105-PDT"
## [21] "2100106-Python"           "2100106-Stochastic Analysis"
## [23] "2100106-Machine Learning" "2100106-PDT"
## [25] "2100107-Python"           "2100107-Stochastic Analysis"
## [27] "2100107-Machine Learning" "2100107-PDT"
## [29] "2100108-Python"           "2100108-Stochastic Analysis"
## [31] "2100108-Machine Learning" "2100108-PDT"
## [33] "2100109-Python"           "2100109-Stochastic Analysis"
## [35] "2100109-Machine Learning" "2100109-PDT"
## [37] "2100110-Python"           "2100110-Stochastic Analysis"
## [39] "2100110-Machine Learning" "2100110-PDT"
## [41] "2100111-Python"           "2100111-Stochastic Analysis"
## [43] "2100111-Machine Learning" "2100111-PDT"
## [45] "2100112-Python"           "2100112-Stochastic Analysis"
## [47] "2100112-Machine Learning" "2100112-PDT"
## [49] "2100113-Python"           "2100113-Stochastic Analysis"
## [51] "2100113-Machine Learning" "2100113-PDT"
## [53] "2100114-Python"           "2100114-Stochastic Analysis"
## [55] "2100114-Machine Learning" "2100114-PDT"
## [57] "2100115-Python"           "2100115-Stochastic Analysis"
## [59] "2100115-Machine Learning" "2100115-PDT"
## [61] "2100116-Python"           "2100116-Stochastic Analysis"
## [63] "2100116-Machine Learning" "2100116-PDT"
## [65] "2100117-Python"           "2100117-Stochastic Analysis"
## [67] "2100117-Machine Learning" "2100117-PDT"
## [69] "2100118-Python"           "2100118-Stochastic Analysis"
## [71] "2100118-Machine Learning" "2100118-PDT"
## [73] "2100119-Python"           "2100119-Stochastic Analysis"
## [75] "2100119-Machine Learning" "2100119-PDT"
## [77] "2100120-Python"           "2100120-Stochastic Analysis"
```

```
## [79] "2100120-Machine Learning"          "2100120-PDT"
## [81] "2100121-Python"                     "2100121-Stochastic Analysis"
## [83] "2100121-Machine Learning"           "2100121-PDT"
## [85] "2100122-Python"                     "2100122-Stochastic Analysis"
## [87] "2100122-Machine Learning"           "2100122-PDT"
## [89] "2100123-Python"                     "2100123-Stochastic Analysis"
## [91] "2100123-Machine Learning"           "2100123-PDT"
## [93] "2100124-Python"                     "2100124-Stochastic Analysis"
## [95] "2100124-Machine Learning"           "2100124-PDT"
## [97] "2100125-Python"                     "2100125-Stochastic Analysis"
## [99] "2100125-Machine Learning"           "2100125-PDT"
## [101] "2100126-Python"                    "2100126-Stochastic Analysis"
## [103] "2100126-Machine Learning"          "2100126-PDT"
## [105] "2100127-Python"                    "2100127-Stochastic Analysis"
## [107] "2100127-Machine Learning"          "2100127-PDT"
## [109] "2100128-Python"                    "2100128-Stochastic Analysis"
## [111] "2100128-Machine Learning"          "2100128-PDT"
## [113] "2100129-Python"                    "2100129-Stochastic Analysis"
## [115] "2100129-Machine Learning"          "2100129-PDT"
## [117] "2100130-Python"                    "2100130-Stochastic Analysis"
## [119] "2100130-Machine Learning"          "2100130-PDT"
## [121] "2100131-Python"                    "2100131-Stochastic Analysis"
## [123] "2100131-Machine Learning"          "2100131-PDT"
## [125] "2100132-Python"                    "2100132-Stochastic Analysis"
## [127] "2100132-Machine Learning"          "2100132-PDT"
## [129] "2100133-Python"                    "2100133-Stochastic Analysis"
## [131] "2100133-Machine Learning"          "2100133-PDT"
## [133] "2100134-Python"                    "2100134-Stochastic Analysis"
## [135] "2100134-Machine Learning"          "2100134-PDT"
## [137] "2100135-Python"                    "2100135-Stochastic Analysis"
## [139] "2100135-Machine Learning"          "2100135-PDT"
## [141] "2100136-Python"                    "2100136-Stochastic Analysis"
## [143] "2100136-Machine Learning"          "2100136-PDT"
## [145] "2100137-Python"                    "2100137-Stochastic Analysis"
## [147] "2100137-Machine Learning"          "2100137-PDT"
## [149] "2100138-Python"                    "2100138-Stochastic Analysis"
## [151] "2100138-Machine Learning"          "2100138-PDT"
## [153] "2100139-Python"                    "2100139-Stochastic Analysis"
## [155] "2100139-Machine Learning"          "2100139-PDT"
```

```
## [157] "2100140-Python"          "2100140-Stochastic Analysis"
## [159] "2100140-Machine Learning" "2100140-PDT"
## [161] "2100141-Python"          "2100141-Stochastic Analysis"
## [163] "2100141-Machine Learning" "2100141-PDT"
## [165] "2100142-Python"          "2100142-Stochastic Analysis"
## [167] "2100142-Machine Learning" "2100142-PDT"
## [169] "2100143-Python"          "2100143-Stochastic Analysis"
## [171] "2100143-Machine Learning" "2100143-PDT"
## [173] "2100144-Python"          "2100144-Stochastic Analysis"
## [175] "2100144-Machine Learning" "2100144-PDT"
## [177] "2100145-Python"          "2100145-Stochastic Analysis"
## [179] "2100145-Machine Learning" "2100145-PDT"
## [181] "2100146-Python"          "2100146-Stochastic Analysis"
## [183] "2100146-Machine Learning" "2100146-PDT"
## [185] "2100147-Python"          "2100147-Stochastic Analysis"
## [187] "2100147-Machine Learning" "2100147-PDT"
## [189] "2100148-Python"          "2100148-Stochastic Analysis"
## [191] "2100148-Machine Learning" "2100148-PDT"
## [193] "2100149-Python"          "2100149-Stochastic Analysis"
## [195] "2100149-Machine Learning" "2100149-PDT"
## [197] "2100150-Python"          "2100150-Stochastic Analysis"
## [199] "2100150-Machine Learning" "2100150-PDT"
## [201] "2100151-Python"          "2100151-Stochastic Analysis"
## [203] "2100151-Machine Learning" "2100151-PDT"
## [205] "2100152-Python"          "2100152-Stochastic Analysis"
## [207] "2100152-Machine Learning" "2100152-PDT"
## [209] "2100153-Python"          "2100153-Stochastic Analysis"
## [211] "2100153-Machine Learning" "2100153-PDT"
## [213] "2100154-Python"          "2100154-Stochastic Analysis"
## [215] "2100154-Machine Learning" "2100154-PDT"
## [217] "2100155-Python"          "2100155-Stochastic Analysis"
## [219] "2100155-Machine Learning" "2100155-PDT"
## [221] "2100156-Python"          "2100156-Stochastic Analysis"
## [223] "2100156-Machine Learning" "2100156-PDT"
## [225] "2100157-Python"          "2100157-Stochastic Analysis"
## [227] "2100157-Machine Learning" "2100157-PDT"
## [229] "2100158-Python"          "2100158-Stochastic Analysis"
## [231] "2100158-Machine Learning" "2100158-PDT"
## [233] "2100159-Python"          "2100159-Stochastic Analysis"
```

```
## [235] "2100159-Machine Learning"      "2100159-PDT"
## [237] "2100160-Python"                 "2100160-Stochastic Analysis"
## [239] "2100160-Machine Learning"       "2100160-PDT"
## [241] "2100161-Python"                 "2100161-Stochastic Analysis"
## [243] "2100161-Machine Learning"       "2100161-PDT"
## [245] "2100162-Python"                 "2100162-Stochastic Analysis"
## [247] "2100162-Machine Learning"       "2100162-PDT"
```

```
cat("\n")
```

```
print("-----")
```

```
## [1] -----
```

```
print("Subjects per Student(MSEA):")
```

```
## [1] "Subjects per Student(MSEA):"
```

```
print("-----")
```

```
## [1] -----
```

```
cat("\n")
```

```
assignf_MSEA
```

```
## [1] "2100201-Microeconomics" "2100201-Python"          "2100201-Macroeconomics"
## [4] "2100201-Research"      "2100202-Methodology"     "2100202-Microeconomics"
## [7] "2100202-Python"        "2100202-Macroeconomics" "2100203-Research"
## [10] "2100203-Methodology"    "2100203-Microeconomics" "2100203-Python"
## [13] "2100204-Macroeconomics" "2100204-Research"       "2100204-Methodology"
## [16] "2100204-Microeconomics" "2100205-Python"         "2100205-Macroeconomics"
## [19] "2100205-Research"      "2100205-Methodology"    "2100206-Microeconomics"
## [22] "2100206-Python"        "2100206-Macroeconomics" "2100206-Research"
## [25] "2100207-Methodology"    "2100207-Microeconomics" "2100207-Python"
## [28] "2100207-Macroeconomics" "2100208-Research"       "2100208-Methodology"
## [31] "2100208-Microeconomics" "2100208-Python"         "2100209-Macroeconomics"
## [34] "2100209-Research"      "2100209-Methodology"    "2100209-Microeconomics"
## [37] "2100210-Python"        "2100210-Macroeconomics" "2100210-Research"
## [40] "2100210-Methodology"    "2100211-Microeconomics" "2100211-Python"
## [43] "2100211-Macroeconomics" "2100211-Research"       "2100212-Methodology"
## [46] "2100212-Microeconomics" "2100212-Python"         "2100212-Macroeconomics"
## [49] "2100213-Research"      "2100213-Methodology"    "2100213-Microeconomics"
## [52] "2100213-Python"        "2100214-Macroeconomics" "2100214-Research"
## [55] "2100214-Methodology"    "2100214-Microeconomics" "2100215-Python"
## [58] "2100215-Macroeconomics" "2100215-Research"       "2100215-Methodology"
## [61] "2100216-Microeconomics" "2100216-Python"         "2100216-Macroeconomics"
## [64] "2100216-Research"      "2100217-Methodology"    "2100217-Microeconomics"
## [67] "2100217-Python"        "2100217-Macroeconomics" "2100218-Research"
## [70] "2100218-Methodology"    "2100218-Microeconomics" "2100218-Python"
## [73] "2100219-Macroeconomics" "2100219-Research"       "2100219-Methodology"
## [76] "2100219-Microeconomics" "2100220-Python"         "2100220-Macroeconomics"
## [79] "2100220-Research"      "2100220-Methodology"    "2100221-Microeconomics"
## [82] "2100221-Python"        "2100221-Macroeconomics" "2100221-Research"
## [85] "2100222-Methodology"    "2100222-Microeconomics" "2100222-Python"
## [88] "2100222-Macroeconomics" "2100223-Research"       "2100223-Methodology"
## [91] "2100223-Microeconomics" "2100223-Python"         "2100224-Macroeconomics"
## [94] "2100224-Research"      "2100224-Methodology"    "2100224-Microeconomics"
## [97] "2100225-Python"        "2100225-Macroeconomics" "2100225-Research"
## [100] "2100225-Methodology"   "2100226-Microeconomics" "2100226-Python"
## [103] "2100226-Macroeconomics" "2100226-Research"
```

```
cat("\n")
```

```
print("-----")
```

```
## [1] -----"
```

```
print("Subjects per Student(BSDS):")
```

```
## [1] "Subjects per Student(BSDS):"
```

```
print("-----")
```

```
## [1] -----"
```

```
cat("\n")
```

```
assignf_BSDS
```

```
## [1] "2100301-Python"          "2100301-R for Analytics"  
## [3] "2100301-Statistics"      "2100301-Calculus"  
## [5] "2100302-Python"          "2100302-R for Analytics"  
## [7] "2100302-Statistics"      "2100302-Calculus"  
## [9] "2100303-Python"          "2100303-R for Analytics"  
## [11] "2100303-Statistics"       "2100303-Calculus"  
## [13] "2100304-Python"          "2100304-R for Analytics"  
## [15] "2100304-Statistics"       "2100304-Calculus"  
## [17] "2100305-Python"          "2100305-R for Analytics"  
## [19] "2100305-Statistics"       "2100305-Calculus"  
## [21] "2100306-Python"          "2100306-R for Analytics"  
## [23] "2100306-Statistics"       "2100306-Calculus"  
## [25] "2100307-Python"          "2100307-R for Analytics"  
## [27] "2100307-Statistics"       "2100307-Calculus"  
## [29] "2100308-Python"          "2100308-R for Analytics"  
## [31] "2100308-Statistics"       "2100308-Calculus"  
## [33] "2100309-Python"          "2100309-R for Analytics"  
## [35] "2100309-Statistics"       "2100309-Calculus"  
## [37] "2100310-Python"          "2100310-R for Analytics"  
## [39] "2100310-Statistics"       "2100310-Calculus"  
## [41] "2100311-Python"          "2100311-R for Analytics"  
## [43] "2100311-Statistics"       "2100311-Calculus"  
## [45] "2100312-Python"          "2100312-R for Analytics"  
## [47] "2100312-Statistics"       "2100312-Calculus"  
## [49] "2100313-Python"          "2100313-R for Analytics"  
## [51] "2100313-Statistics"       "2100313-Calculus"  
## [53] "2100314-Python"          "2100314-R for Analytics"  
## [55] "2100314-Statistics"       "2100314-Calculus"  
## [57] "2100315-Python"          "2100315-R for Analytics"  
## [59] "2100315-Statistics"       "2100315-Calculus"  
## [61] "2100316-Python"          "2100316-R for Analytics"  
## [63] "2100316-Statistics"       "2100316-Calculus"  
## [65] "2100317-Python"          "2100317-R for Analytics"  
## [67] "2100317-Statistics"       "2100317-Calculus"  
## [69] "2100318-Python"          "2100318-R for Analytics"  
## [71] "2100318-Statistics"       "2100318-Calculus"  
## [73] "2100319-Python"          "2100319-R for Analytics"  
## [75] "2100319-Statistics"       "2100319-Calculus"  
## [77] "2100320-Python"          "2100320-R for Analytics"
```

```
## [79] "2100320-Statistics"      "2100320-Calculus"
## [81] "2100321-Python"          "2100321-R for Analytics"
## [83] "2100321-Statistics"      "2100321-Calculus"
## [85] "2100322-Python"          "2100322-R for Analytics"
## [87] "2100322-Statistics"      "2100322-Calculus"
## [89] "2100323-Python"          "2100323-R for Analytics"
## [91] "2100323-Statistics"      "2100323-Calculus"
## [93] "2100324-Python"          "2100324-R for Analytics"
## [95] "2100324-Statistics"      "2100324-Calculus"
## [97] "2100325-Python"          "2100325-R for Analytics"
## [99] "2100325-Statistics"      "2100325-Calculus"
## [101] "2100326-Python"         "2100326-R for Analytics"
## [103] "2100326-Statistics"      "2100326-Calculus"
## [105] "2100327-Python"         "2100327-R for Analytics"
## [107] "2100327-Statistics"      "2100327-Calculus"
## [109] "2100328-Python"         "2100328-R for Analytics"
## [111] "2100328-Statistics"      "2100328-Calculus"
## [113] "2100329-Python"         "2100329-R for Analytics"
## [115] "2100329-Statistics"      "2100329-Calculus"
## [117] "2100330-Python"         "2100330-R for Analytics"
## [119] "2100330-Statistics"      "2100330-Calculus"
## [121] "2100331-Python"         "2100331-R for Analytics"
## [123] "2100331-Statistics"      "2100331-Calculus"
## [125] "2100332-Python"         "2100332-R for Analytics"
## [127] "2100332-Statistics"      "2100332-Calculus"
## [129] "2100333-Python"         "2100333-R for Analytics"
## [131] "2100333-Statistics"      "2100333-Calculus"
## [133] "2100334-Python"         "2100334-R for Analytics"
## [135] "2100334-Statistics"      "2100334-Calculus"
## [137] "2100335-Python"         "2100335-R for Analytics"
## [139] "2100335-Statistics"      "2100335-Calculus"
## [141] "2100336-Python"         "2100336-R for Analytics"
## [143] "2100336-Statistics"      "2100336-Calculus"
## [145] "2100337-Python"         "2100337-R for Analytics"
## [147] "2100337-Statistics"      "2100337-Calculus"
```

```
cat("\n")
```

```
print("-----")
```

```
## [1] -----"
```

```
print("Subjects per Student(BSEA):")
```

```
## [1] "Subjects per Student(BSEA):"
```

```
print("-----")
```

```
## [1] -----"
```

```
cat("\n")
```

```
assignf_BSEA
```

```
## [1] "2100401-Statistics" "2100401-Python"      "2100401-Calculus"
## [4] "2100401-Economics"   "2100402-Statistics" "2100402-Python"
## [7] "2100402-Calculus"    "2100402-Economics"  "2100403-Statistics"
## [10] "2100403-Python"     "2100403-Calculus"   "2100403-Economics"
## [13] "2100404-Statistics"  "2100404-Python"    "2100404-Calculus"
## [16] "2100404-Economics"  "2100405-Statistics" "2100405-Python"
## [19] "2100405-Calculus"   "2100405-Economics" "2100406-Statistics"
## [22] "2100406-Python"    "2100406-Calculus"  "2100406-Economics"
## [25] "2100407-Statistics"  "2100407-Python"   "2100407-Calculus"
## [28] "2100407-Economics"  "2100408-Statistics" "2100408-Python"
## [31] "2100408-Calculus"   "2100408-Economics" "2100409-Statistics"
## [34] "2100409-Python"     "2100409-Calculus"  "2100409-Economics"
## [37] "2100410-Statistics"  "2100410-Python"   "2100410-Calculus"
## [40] "2100410-Economics"  "2100411-Statistics" "2100411-Python"
## [43] "2100411-Calculus"   "2100411-Economics" "2100412-Statistics"
## [46] "2100412-Python"     "2100412-Calculus"  "2100412-Economics"
## [49] "2100413-Statistics"  "2100413-Python"   "2100413-Calculus"
## [52] "2100413-Economics"  "2100414-Statistics" "2100414-Python"
## [55] "2100414-Calculus"   "2100414-Economics" "2100415-Statistics"
## [58] "2100415-Python"     "2100415-Calculus"  "2100415-Economics"
## [61] "2100416-Statistics"  "2100416-Python"   "2100416-Calculus"
## [64] "2100416-Economics"  "2100417-Statistics" "2100417-Python"
## [67] "2100417-Calculus"   "2100417-Economics" "2100418-Statistics"
## [70] "2100418-Python"     "2100418-Calculus"  "2100418-Economics"
## [73] "2100419-Statistics"  "2100419-Python"   "2100419-Calculus"
## [76] "2100419-Economics"  "2100420-Statistics" "2100420-Python"
## [79] "2100420-Calculus"   "2100420-Economics" "2100421-Statistics"
## [82] "2100421-Python"     "2100421-Calculus"  "2100421-Economics"
## [85] "2100422-Statistics"  "2100422-Python"   "2100422-Calculus"
## [88] "2100422-Economics"  "2100423-Statistics" "2100423-Python"
## [91] "2100423-Calculus"   "2100423-Economics" "2100424-Statistics"
## [94] "2100424-Python"     "2100424-Calculus"  "2100424-Economics"
## [97] "2100425-Statistics"  "2100425-Python"   "2100425-Calculus"
## [100] "2100425-Economics"  "2100426-Statistics" "2100426-Python"
## [103] "2100426-Calculus"   "2100426-Economics" "2100427-Statistics"
## [106] "2100427-Python"     "2100427-Calculus"  "2100427-Economics"
## [109] "2100428-Statistics"  "2100428-Python"   "2100428-Calculus"
## [112] "2100428-Economics"  "2100429-Statistics" "2100429-Python"
## [115] "2100429-Calculus"   "2100429-Economics" "2100430-Statistics"
```

```
## [118] "2100430-Python"      "2100430-Calculus"    "2100430-Economics"
## [121] "2100431-Statistics"   "2100431-Python"     "2100431-Calculus"
## [124] "2100431-Economics"   "2100432-Statistics" "2100432-Python"
## [127] "2100432-Calculus"    "2100432-Economics" "2100433-Statistics"
## [130] "2100433-Python"      "2100433-Calculus"  "2100433-Economics"
## [133] "2100434-Statistics"   "2100434-Python"    "2100434-Calculus"
## [136] "2100434-Economics"   "2100435-Statistics" "2100435-Python"
## [139] "2100435-Calculus"    "2100435-Economics" "2100436-Statistics"
## [142] "2100436-Python"      "2100436-Calculus"  "2100436-Economics"
## [145] "2100437-Statistics"   "2100437-Python"    "2100437-Calculus"
## [148] "2100437-Economics"   "2100438-Statistics" "2100438-Python"
## [151] "2100438-Calculus"    "2100438-Economics" "2100439-Statistics"
## [154] "2100439-Python"      "2100439-Calculus"  "2100439-Economics"
## [157] "2100440-Statistics"   "2100440-Python"    "2100440-Calculus"
## [160] "2100440-Economics"   "2100441-Statistics" "2100441-Python"
## [163] "2100441-Calculus"    "2100441-Economics" "2100442-Statistics"
## [166] "2100442-Python"      "2100442-Calculus"  "2100442-Economics"
## [169] "2100443-Statistics"   "2100443-Python"    "2100443-Calculus"
## [172] "2100443-Economics"   "2100444-Statistics" "2100444-Python"
## [175] "2100444-Calculus"    "2100444-Economics" "2100445-Statistics"
## [178] "2100445-Python"      "2100445-Calculus"  "2100445-Economics"
```

```
cat("\n")
```

Q5) The Python subject in all the courses has a lab component and hence the faculty has to assign the students in each class to separate groups. MSDS has 4 groups MSEEA has 2 groups BSDS has 3 groups BSEA has 4 groups The allocation will happen for each student alternatively. For example reg 1 gets A, reg 2 gets B , reg 3 gets C and so on.

```
group_MSDS <- c("A", "B", "C", "D")
group_MSEA <- c("A", "B")
group_BSDFS <- c("A", "B", "C")
group_BSEA <- c("A", "B", "C", "D")

groupf_MSDS <- paste(MSDS, group_MSDS, sep = "-")
groupf_MSEA <- paste(MSEA, group_MSEA, sep = "-")
groupf_BSDFS <- paste(BSDFS, group_BSDFS, sep = "-")
groupf_BSEA <- paste(BSEA, group_BSEA, sep = "-")

print("-----")
```

```
## [1] -----
```

```
print("Groups for python lab (MSDS):")
```

```
## [1] "Groups for python lab (MSDS):"
```

```
print("-----")
```

```
## [1] -----
```

```
cat("\n")
```

```
groupf_MSDS
```

```
## [1] "2100101-A" "2100102-B" "2100103-C" "2100104-D" "2100105-A" "2100106-B"  
## [7] "2100107-C" "2100108-D" "2100109-A" "2100110-B" "2100111-C" "2100112-D"  
## [13] "2100113-A" "2100114-B" "2100115-C" "2100116-D" "2100117-A" "2100118-B"  
## [19] "2100119-C" "2100120-D" "2100121-A" "2100122-B" "2100123-C" "2100124-D"  
## [25] "2100125-A" "2100126-B" "2100127-C" "2100128-D" "2100129-A" "2100130-B"  
## [31] "2100131-C" "2100132-D" "2100133-A" "2100134-B" "2100135-C" "2100136-D"  
## [37] "2100137-A" "2100138-B" "2100139-C" "2100140-D" "2100141-A" "2100142-B"  
## [43] "2100143-C" "2100144-D" "2100145-A" "2100146-B" "2100147-C" "2100148-D"  
## [49] "2100149-A" "2100150-B" "2100151-C" "2100152-D" "2100153-A" "2100154-B"  
## [55] "2100155-C" "2100156-D" "2100157-A" "2100158-B" "2100159-C" "2100160-D"  
## [61] "2100161-A" "2100162-B"
```

```
cat("\n")
```

```
print("-----")
```

```
## [1] -----
```

```
print("Groups for python lab (MSEA):")
```

```
## [1] "Groups for python lab (MSEA):"
```

```
print("-----")
```

```
## [1] -----
```

```
cat("\n")
```

```
groupf_MSEA
```

```
## [1] "2100201-A" "2100202-B" "2100203-A" "2100204-B" "2100205-A" "2100206-B"  
## [7] "2100207-A" "2100208-B" "2100209-A" "2100210-B" "2100211-A" "2100212-B"  
## [13] "2100213-A" "2100214-B" "2100215-A" "2100216-B" "2100217-A" "2100218-B"  
## [19] "2100219-A" "2100220-B" "2100221-A" "2100222-B" "2100223-A" "2100224-B"  
## [25] "2100225-A" "2100226-B"
```

```
cat("\n")
```

```
print("-----")
```

```
## [1] -----
```

```
print("Groups for python lab (BSDS):")
```

```
## [1] "Groups for python lab (BSDS):"
```

```
print("-----")
```

```
## [1] -----
```

```
cat("\n")
```

```
groupf_BSDS
```

```
## [1] "2100301-A" "2100302-B" "2100303-C" "2100304-A" "2100305-B" "2100306-C"  
## [7] "2100307-A" "2100308-B" "2100309-C" "2100310-A" "2100311-B" "2100312-C"  
## [13] "2100313-A" "2100314-B" "2100315-C" "2100316-A" "2100317-B" "2100318-C"  
## [19] "2100319-A" "2100320-B" "2100321-C" "2100322-A" "2100323-B" "2100324-C"  
## [25] "2100325-A" "2100326-B" "2100327-C" "2100328-A" "2100329-B" "2100330-C"  
## [31] "2100331-A" "2100332-B" "2100333-C" "2100334-A" "2100335-B" "2100336-C"  
## [37] "2100337-A"
```

```
cat("\n")  
  
print("-----")  
  
## [1] -----  
  
print("Groups for python lab (BSEA):")  
  
## [1] "Groups for python lab (BSEA):"  
  
print("-----")  
  
## [1] -----  
  
cat("\n")  
  
groupf_BSEA  
  
## [1] "2100401-A" "2100402-B" "2100403-C" "2100404-D" "2100405-A" "2100406-B"  
## [7] "2100407-C" "2100408-D" "2100409-A" "2100410-B" "2100411-C" "2100412-D"  
## [13] "2100413-A" "2100414-B" "2100415-C" "2100416-D" "2100417-A" "2100418-B"  
## [19] "2100419-C" "2100420-D" "2100421-A" "2100422-B" "2100423-C" "2100424-D"  
## [25] "2100425-A" "2100426-B" "2100427-C" "2100428-D" "2100429-A" "2100430-B"  
## [31] "2100431-C" "2100432-D" "2100433-A" "2100434-B" "2100435-C" "2100436-D"  
## [37] "2100437-A" "2100438-B" "2100439-C" "2100440-D" "2100441-A" "2100442-B"  
## [43] "2100443-C" "2100444-D" "2100445-A"
```

Q6) 6. The students are given marks for one of the subject out of 50: MSDS-Stochastic MSEA - Microeconomics BSDS - Python BSEA - R for Analytics Populate a vector for the marks of these subjects using a ransom sample. set the seed value to 155.

```
set.seed(155)
marks_MSDS <- sample(1:50, 62, replace = T)
marks_MSEA <- sample(1:50, 26, replace = T)
marks_BSDES <- sample(1:50, 37, replace = T)
marks_BSEA <- sample(1:50, 45, replace = T)

names(marks_MSDS) <- MSDS
print("-----")
```

```
## [1] "-----"
```

```
print("Stochastic Marks (MSDS):")
```

```
## [1] "Stochastic Marks (MSDS):"
```

```
print("-----")
```

```
## [1] "-----"
```

```
cat("\n")
```

```
marks_MSDS
```

```
## 2100101 2100102 2100103 2100104 2100105 2100106 2100107 2100108 2100109 2100110
##      6     14     42     42     49      2     26     34     39     50
## 2100111 2100112 2100113 2100114 2100115 2100116 2100117 2100118 2100119 2100120
##      44     15     40     39     11     21     50     25     37     11
## 2100121 2100122 2100123 2100124 2100125 2100126 2100127 2100128 2100129 2100130
##      24     14     34     39     34     14     38     15     47      6
## 2100131 2100132 2100133 2100134 2100135 2100136 2100137 2100138 2100139 2100140
##      29     30     10     12     46     32      6     34     42     23
## 2100141 2100142 2100143 2100144 2100145 2100146 2100147 2100148 2100149 2100150
##      20     18     39     35     32     17     40     32      2      4
## 2100151 2100152 2100153 2100154 2100155 2100156 2100157 2100158 2100159 2100160
##      45     23     46     10     19     27     28     13     27     21
## 2100161 2100162
##      24     16
```

```
cat("\n")
```

```
names(marks_MSEA) <- MSEA
print("-----")
```

```
## [1] -----
```

```
print("Microeconomics Marks (MSEA):")
```

```
## [1] "Microeconomics Marks (MSEA):"
```

```
print("-----")
```

```
## [1] -----
```

```
cat("\n")
```

```
marks_MSEA
```

```
## 2100201 2100202 2100203 2100204 2100205 2100206 2100207 2100208 2100209 2100210
##      4      35      27      26      12      26      32      11      13      42
## 2100211 2100212 2100213 2100214 2100215 2100216 2100217 2100218 2100219 2100220
##      10      3      41      9      37      32      22      9      16      48
## 2100221 2100222 2100223 2100224 2100225 2100226
##      40      35      21      17      22      32
```

```
cat("\n")
```

```
names(marks_BSDS) <- BSDS
print("-----")
```

```
## [1] -----
```

```
print("Python Marks (BSDS):")
```

```
## [1] "Python Marks (BSDS):"
```

```
print("-----")
```

```
## [1] -----
```

```
cat("\n")
```

```
marks_BSDS
```

```
## 2100301 2100302 2100303 2100304 2100305 2100306 2100307 2100308 2100309 2100310
##    21      3      3     40     26     17     10     35      7     49
## 2100311 2100312 2100313 2100314 2100315 2100316 2100317 2100318 2100319 2100320
##    2     24     39     44      3     39     25     38      9     15
## 2100321 2100322 2100323 2100324 2100325 2100326 2100327 2100328 2100329 2100330
##   45     21     28      1     13     30     15     39      6     17
## 2100331 2100332 2100333 2100334 2100335 2100336 2100337
##   14     17     15     31     20     49     21
```

```
cat("\n")
```

```
names(marks_BSEA) <- BSEA
print("-----")
```

```
## [1] -----
```

```
print("R for Analytics Marks (BSEA):")
```

```
## [1] "R for Analytics Marks (BSEA):"
```

```
print("-----")
```

```
## [1] -----
```

```
cat("\n")
```

```
marks_BSEA
```

```
## 2100401 2100402 2100403 2100404 2100405 2100406 2100407 2100408 2100409 2100410
##     34      43      35      8     25     37     20      6      5     20
## 2100411 2100412 2100413 2100414 2100415 2100416 2100417 2100418 2100419 2100420
##     14      23      1     50     37     14      4     33     20     35
## 2100421 2100422 2100423 2100424 2100425 2100426 2100427 2100428 2100429 2100430
##     13      15     34     22     49      4     37     16     41     46
## 2100431 2100432 2100433 2100434 2100435 2100436 2100437 2100438 2100439 2100440
##     26      37     15      9     21     12     32     34     27      4
## 2100441 2100442 2100443 2100444 2100445
##     24      29     10     25     35
```

Q7) As few students have not appeared for exams, consider the marks to be NA. The reg numbers who missed the exams are- MSDS:
12,13,18,23 MSE: 13,8 BSDS:10,20,37 BSEA:17,19

```
marks_MSDS[c(12, 13, 18, 23)] <- NA
marks_MSE[c(13, 18)] <- NA
marks_BSDS[c(10, 20, 37)] <- NA
marks_BSEA[c(17, 19)] <- NA

print("-----")
```

```
## [1] "-----"
```

```
print("Stochastic Marks (MSDS):")
```

```
## [1] "Stochastic Marks (MSDS):"
```

```
print("-----")
```

```
## [1] "-----"
```

```
cat("\n")
```

```
marks_MSDS
```

```
## 2100101 2100102 2100103 2100104 2100105 2100106 2100107 2100108 2100109 2100110
##      6     14     42     42     49      2     26     34     39     50
## 2100111 2100112 2100113 2100114 2100115 2100116 2100117 2100118 2100119 2100120
##     44     NA     NA     39     11     21     50     NA     37     11
## 2100121 2100122 2100123 2100124 2100125 2100126 2100127 2100128 2100129 2100130
##     24     14     NA     39     34     14     38     15     47      6
## 2100131 2100132 2100133 2100134 2100135 2100136 2100137 2100138 2100139 2100140
##     29     30     10     12     46     32      6     34     42     23
## 2100141 2100142 2100143 2100144 2100145 2100146 2100147 2100148 2100149 2100150
##     20     18     39     35     32     17     40     32      2      4
## 2100151 2100152 2100153 2100154 2100155 2100156 2100157 2100158 2100159 2100160
##     45     23     46     10     19     27     28     13     27     21
## 2100161 2100162
##     24     16
```

```
cat("\n")
```

```
print("-----")
```

```
## [1] -----
```

```
print("Microeconomics Marks (MSEA):")
```

```
## [1] "Microeconomics Marks (MSEA):"
```

```
print("-----")
```

```
## [1] -----
```

```
cat("\n")
```

```
marks_MSEA
```

```
## 2100201 2100202 2100203 2100204 2100205 2100206 2100207 2100208 2100209 2100210
##     4      35      27      26      12      26      32      11      13      42
## 2100211 2100212 2100213 2100214 2100215 2100216 2100217 2100218 2100219 2100220
##    10      3     NA      9     37     32     22     NA     16     48
## 2100221 2100222 2100223 2100224 2100225 2100226
##    40      35      21      17      22      32
```

```
cat("\n")
```

```
print("-----")
```

```
## [1] -----
```

```
print("Python Marks (BSDS):")
```

```
## [1] "Python Marks (BSDS):"
```

```
print("-----")
```

```
## [1] -----
```

```
cat("\n")
```

```
marks_BSDS
```

```
## 2100301 2100302 2100303 2100304 2100305 2100306 2100307 2100308 2100309 2100310
##    21      3      3     40     26     17     10     35      7    NA
## 2100311 2100312 2100313 2100314 2100315 2100316 2100317 2100318 2100319 2100320
##    2     24     39     44      3     39     25     38      9    NA
## 2100321 2100322 2100323 2100324 2100325 2100326 2100327 2100328 2100329 2100330
##   45     21     28      1     13     30     15     39      6    17
## 2100331 2100332 2100333 2100334 2100335 2100336 2100337
##   14     17     15     31     20     49    NA
```

```
cat("\n")
```

```
print("-----")
```

```
## [1] -----
```

```
print("R for Analytics Marks (BSEA):")
```

```
## [1] "R for Analytics Marks (BSEA):"
```

```
print("-----")
```

```
## [1] -----
```

```
cat("\n")
```

```
marks_BSEA
```

```
## 2100401 2100402 2100403 2100404 2100405 2100406 2100407 2100408 2100409 2100410
##     34      43      35      8     25     37     20      6      5     20
## 2100411 2100412 2100413 2100414 2100415 2100416 2100417 2100418 2100419 2100420
##     14      23      1     50     37     14     NA     33     NA     35
## 2100421 2100422 2100423 2100424 2100425 2100426 2100427 2100428 2100429 2100430
##     13      15     34     22     49      4     37     16     41     46
## 2100431 2100432 2100433 2100434 2100435 2100436 2100437 2100438 2100439 2100440
##     26      37     15      9     21     12     32     34     27      4
## 2100441 2100442 2100443 2100444 2100445
##     24      29     10     25     35
```

Q8) Create a vector that has marks of the students who appeared for the exams for all the programmes.

```
appeared_MSDS <- marks_MSDS[!is.na(marks_MSDS)]
appeared_MSEA <- marks_MSEA[!is.na(marks_MSEA)]
appeared_BSDS <- marks_BSDS[!is.na(marks_BSDS)]
appeared_BSEA <- marks_BSEA[!is.na(marks_BSEA)]

print("-----")
```

```
## [1] -----"
```

```
print("Stochastic Marks of presentees (MSDS):")
```

```
## [1] "Stochastic Marks of presentees (MSDS):"
```

```
print("-----")
```

```
## [1] -----"
```

```
cat("\n")
```

```
appeared_MSDS
```

```
## 2100101 2100102 2100103 2100104 2100105 2100106 2100107 2100108 2100109 2100110
##   6     14     42     42     49      2     26     34     39     50
## 2100111 2100114 2100115 2100116 2100117 2100119 2100120 2100121 2100122 2100124
##   44     39     11     21     50     37     11     24     14     39
## 2100125 2100126 2100127 2100128 2100129 2100130 2100131 2100132 2100133 2100134
##   34     14     38     15     47      6     29     30     10     12
## 2100135 2100136 2100137 2100138 2100139 2100140 2100141 2100142 2100143 2100144
##   46     32      6     34     42     23     20     18     39     35
## 2100145 2100146 2100147 2100148 2100149 2100150 2100151 2100152 2100153 2100154
##   32     17     40     32      2      4     45     23     46     10
## 2100155 2100156 2100157 2100158 2100159 2100160 2100161 2100162
##   19     27     28     13     27     21     24     16
```

```
cat("\n")
```

```
print("-----")
```

```
## [1] -----"
```

```
print("Stochastic Marks of presentees (MSEA):")
```

```
## [1] "Stochastic Marks of presentees (MSEA):"
```

```
print("-----")
```

```
## [1] -----"
```

```
cat("\n")
```

```
appeared_MSEA
```

```
## 2100201 2100202 2100203 2100204 2100205 2100206 2100207 2100208 2100209 2100210
##     4      35      27      26      12      26      32      11      13      42
## 2100211 2100212 2100214 2100215 2100216 2100217 2100219 2100220 2100221 2100222
##     10      3      9      37      32      22      16      48      40      35
## 2100223 2100224 2100225 2100226
##     21      17      22      32
```

```
cat("\n")
```

```
print("-----")
```

```
## [1] -----"
```

```
print("Stochastic Marks of presentees (BSDS):")
```

```
## [1] "Stochastic Marks of presentees (BSDS):"
```

```
print("-----")
```

```
## [1] -----"
```

```
cat("\n")
```

```
appeared_BSDS
```

```
## 2100301 2100302 2100303 2100304 2100305 2100306 2100307 2100308 2100309 2100311  
##      21       3       3      40      26      17      10      35       7       2  
## 2100312 2100313 2100314 2100315 2100316 2100317 2100318 2100319 2100321 2100322  
##      24      39      44       3      39      25      38       9      45      21  
## 2100323 2100324 2100325 2100326 2100327 2100328 2100329 2100330 2100331 2100332  
##      28       1      13      30      15      39       6      17      14      17  
## 2100333 2100334 2100335 2100336  
##      15      31      20      49
```

```
cat("\n")
```

```
print("-----")
```

```
## [1] -----"
```

```
print("Stochastic Marks of presentees (BSEA):")
```

```
## [1] "Stochastic Marks of presentees (BSEA):"
```

```
print("-----")
```

```
## [1] -----"
```

```
cat("\n")
```

```
appeared_BSEA
```

```
## 2100401 2100402 2100403 2100404 2100405 2100406 2100407 2100408 2100409 2100410
##     34      43      35      8     25      37      20      6      5     20
## 2100411 2100412 2100413 2100414 2100415 2100416 2100418 2100420 2100421 2100422
##     14      23      1     50     37     14     33     35     13     15
## 2100423 2100424 2100425 2100426 2100427 2100428 2100429 2100430 2100431 2100432
##     34      22      48      4     37     16     41     46     26     37
## 2100433 2100434 2100435 2100436 2100437 2100438 2100439 2100440 2100441 2100442
##     15      9     21     12     32     34     27     4     24     29
## 2100443 2100444 2100445
##     10     25     35
```

Q9) Create and populate four separate vectors that has groups of python for all the programmes. convert this into factor variable.

```
python_MSDS <- c("A", "B", "C", "D")
pythonf_MSDS <- as.factor(python_MSDS)
arrMSDS <- array(pythonf_MSDS, dim = c(62))
```

```
python_MSEA <- c("A", "B", "C", "D")
pythonf_MSEA <- as.factor(python_MSEA)
arrMSEA <- array(pythonf_MSEA, dim = c(26))
```

```
python_BSDS <- c("A", "B", "C", "D")
pythonf_BSDS <- as.factor(python_BSDS)
arrBSDS <- array(pythonf_BSDS, dim = c(37))
```

```
python_BSEA <- c("A", "B", "C", "D")
pythonf_BSEA <- as.factor(python_BSEA)
arrBSEA <- array(pythonf_BSEA, dim = c(45))
```

```
print("-----")
```

```
## [1] -----
```

```
print("Groups for Python (MSDS):")
```

```
## [1] "Groups for Python (MSDS):"
```

```
print("-----")
```

```
## [1] -----"
```

```
cat("\n")
```

```
pythonf_MSDS
```

```
## [1] A B c D
## Levels: A B c D
```

```
arrMSDS
```

```
## [1] "A" "B" "c" "D" "A" "B" "c" "D" "A" "B" "c" "D" "A" "B" "c" "D" "A" "B" "c"
## [20] "D" "A" "B" "c" "D" "A" "B" "c" "D" "A" "B" "c" "D" "A" "B" "c" "D" "A" "B"
## [39] "c" "D" "A" "B" "c" "D" "A" "B" "c" "D" "A" "B" "c" "D" "A" "B" "c" "D" "A"
## [58] "B" "c" "D" "A" "B"
```

```
cat("\n")
```

```
print("-----")
```

```
## [1] -----"
```

```
print("Groups for Python (MSEA):")
```

```
## [1] "Groups for Python (MSEA):"
```

```
print("-----")
```

```
## [1] "-----"
```

```
cat("\n")
```

```
pythonf_MSEA
```

```
## [1] A B c D  
## Levels: A B c D
```

```
arrMSEA
```

```
## [1] "A" "B" "c" "D" "A" "B" "c" "D" "A" "B" "c" "D" "A" "B" "c" "D" "A" "B" "c"  
## [20] "D" "A" "B" "c" "D" "A" "B"
```

```
cat("\n")
```

```
print("-----")
```

```
## [1] "-----"
```

```
print("Groups for Python (BSDS):")
```

```
## [1] "Groups for Python (BSDS):"
```

```
print("-----")
```

```
## [1] "-----"
```

```
cat("\n")
```

```
pythonf_BSDE
```

```
## [1] A B c D  
## Levels: A B c D
```

```
arrBSDE
```

```
## [1] "A" "B" "c" "D" "A" "B" "c" "D" "A" "B" "c" "D" "A" "B" "c" "D" "A" "B" "c"  
## [20] "D" "A" "B" "c" "D" "A" "B" "c" "D" "A" "B" "c" "D" "A" "B" "c" "D" "A"
```

```
cat("\n")
```

```
print("-----")
```

```
## [1] -----
```

```
print("Groups for Python (BSEA):")
```

```
## [1] "Groups for Python (BSEA):"
```

```
print("-----")
```

```
## [1] -----
```

```
cat("\n")
```

```
pythonf_BSEA
```

```
## [1] A B c D  
## Levels: A B c D
```

```
arrBSEA
```

```
## [1] "A" "B" "c" "D" "A" "B" "c" "D" "A" "B" "c" "D" "A" "B" "c" "D" "A" "B" "c"  
## [20] "D" "A" "B" "c" "D" "A" "B" "c" "D" "A" "B" "c" "D" "A" "B" "c" "D" "A" "B"  
## [39] "c" "D" "A" "B" "c" "D" "A"
```

```
cat("\n")
```

Q10) Calcute the mean of each group for the subject python in all the courses.

```
marksf_MSDS <-sample(1:50,62,replace=T)  
marksf_MSEA <-sample(1:50,26,replace=T)  
marksf_BSDE <-sample(1:50,37,replace=T)  
marksf_BSEA <-sample(1:50,45,replace=T)
```

```
mean1 <- tapply(marksf_MSDS, arrMSDS, mean)  
mean2 <- tapply(marksf_MSEA, arrMSEA, mean)  
mean3 <- tapply(marksf_BSDE, arrBSDE, mean)  
mean4 <- tapply(marksf_BSEA, arrBSEA, mean)
```

```
mean1
```

```
##      A        B        C        D  
## 19.43750 25.18750 29.73333 21.06667
```

```
mean2
```

```
##      A        B        C        D  
## 26.28571 28.00000 25.66667 26.50000
```

```
mean3
```

```
##      A      B      C      D  
## 30.70000 39.55556 26.66667 25.66667
```

```
mean4
```

```
##      A      B      C      D  
## 22.25000 26.45455 20.54545 30.00000
```