MSMS 106 : Practical 13

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Objective

Write an R program to generate all possible subsets of the set $\{1, 2, 3\}$.

R Program

```
x1 <- c(1, 2, 3)
```

```
generate_subset <- function(set){
  backtrack_subset(set, 1, c())
}

backtrack_subset <- function(set, index, current_subset){
  if(index > length(set)){
    print(current_subset)
  } else{
    current_subset <- unique(c(current_subset, set[index]))
    backtrack_subset(set, index + 1, current_subset)

    current_subset <- current_subset[-length(current_subset)]
    backtrack_subset(set, index + 1, current_subset)
  }
}
```

```
generate_subset(x1)

## [1] 1 2 3
## [1] 1 2
## [1] 1 3
## [1] 1
## [1] 2 3
## [1] 2
## [1] 3
## numeric(0)
```

Conclusion

✎ We get a class of all 8 subsets of $\{1, 2, 3\}$, thus a $\sigma-$field on $\Omega = \{1, 2, 3\}$.