

# Exam 1: Take-Home (25 points)

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## 1. THE DRAW

```
draw <- function () {  
  digit <- sample(1:75, 1)  
  if (digit > 60) {  
    letter <- "O"  
  } else if (digit > 45) {  
    letter <- "G"  
  } else if (digit > 30) {  
    letter <- "N"  
  } else if (digit > 15) {  
    letter <- "I"  
  } else {  
    letter <- "B"  
  }  
  end  
  
  cat(letter, digit)  
}
```

## 2. THE CARD

```
card <- function () {  
  B <- c(sample(1:15, 5))  
  I <- c(sample(16:30, 5))  
  N <- c(sample(31:45, 5))  
  G <- c(sample(46:60, 5))  
  O <- c(sample(61:75, 5))  
  card <- matrix(c(B,I,N,G,O), nrow = 5, ncol = 5, byrow = FALSE,  
                 list(c("1","2","3","4","5"), c("B","I","N","G","O")))  
  card[3,3] <- NA  
  
  print(card)  
}
```

## 3. THE GAME

```

myplayers <- c("Player 1","Player 2","Player 3")

game <- function(players) {
  createcards(players)

  win <- FALSE

  while (win) {
    combo <- draw()
    checkforvalue(combo)

    win <- checkforwin(player1)
    if (players[2] != NULL) {
      win <- checkforwin(player2)
      if (players[3] != NULL) {
        win <- checkforwin(player3)
        if (players[4] != NULL) {
          win <- checkforwin(player4)
          if (players[5] != NULL) {
            win <- checkforwin(player5)
          }
        }
      }
    }
  }
}

createcards <- function(players) {
  player1 <- card()
  if (players[2] != NULL) {
    player2 <- card()
    if (players[3] != NULL) {
      player3 <- card()
      if (players[4] != NULL) {
        player4 <- card()
        if (players[5] != NULL) {
          player5 <- card()
        }
      }
    }
  }
}

checkforvalue <- function (value) {
  player1[any(player1 = value)] <- NA
  if (players[2] != NULL) {
    player2[any(player2 = value)] <- NA
    if (players[3] != NULL) {
      player3[any(player3 = value)] <- NA
    }
  }
}

```

```

    if (players[4] != NULL) {
      player4[any(player4 = value)] <- NA
      if (players[5] != NULL) {
        player5[any(player5 = value)] <- NA
      }
    }
  }
}

checkforwin <- function (playerboard) {
  if (playerboard[all(playerboard[1, ] == NA)]) {
    win <- TRUE
  } else if (playerboard[all(playerboard[, 1] == NA)]) {
    win <- TRUE
  } else if (playerboard[all(diag(playerboard, nrow = 5, ncol = 5) == NA)]) {
    win <- TRUE
  } else {
    win <- FALSE
  }
}

game(myplayers)

##      B I N G O
## 1   1 16 39 55 71
## 2   9 20 31 59 64
## 3  14 23 NA 46 73
## 4   8 29 35 58 75
## 5   4 18 40 60 61

## Error in if (players[2] != NULL) {: argument is of length
zero

```