

Domino Die Problem

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<https://codegolf.stackexchange.com/questions/2602/draw-dice-results-in-ascii>

```
genPipsMtrx <- function(fst_pips, fst_rot) {  
  dtMtrx1 <- matrix(rep(0, 9), nrow=3, ncol=3)  
  if (fst_pips == 1) {  
    dtMtrx1 <- matrix(c(0,0,0,0,1,0,0,0,0), nrow=3, ncol=3)  
  } else if (fst_pips == 2) {  
    if (fst_rot) {  
      dtMtrx1 <- matrix(c(1,0,0,0,0,0,0,0,1), nrow=3, ncol=3)  
    } else {  
      dtMtrx1 <- matrix(c(0,0,1,0,0,0,1,0,0), nrow=3, ncol=3)  
    }  
  } else if (fst_pips == 3) {  
    if (fst_rot) {  
      dtMtrx1 <- matrix(c(1,0,0,0,1,0,0,0,1), nrow=3, ncol=3)  
    } else {  
      dtMtrx1 <- matrix(c(0,0,1,0,1,0,1,0,0), nrow=3, ncol=3)  
    }  
  } else if (fst_pips == 4) {  
    dtMtrx1 <- matrix(c(1,0,1,0,0,0,1,0,1), nrow=3, ncol=3)  
  } else if (fst_pips == 5) {  
    dtMtrx1 <- matrix(c(1,0,1,0,1,0,1,0,1), nrow=3, ncol=3)  
  } else if (fst_pips == 6) {  
    if (fst_rot) {  
      dtMtrx1 <- matrix(c(1,0,1,1,0,1,1,0,1), nrow=3, ncol=3)  
    } else {  
      dtMtrx1 <- matrix(c(1,1,1,0,0,0,1,1,1), nrow=3, ncol=3)  
    }  
  }  
  return(dtMtrx1)  
}
```

```
disTpDwnFace <-  
  function (pips, rot) {  
    pipLineTopBot <- "-----"  
    if (pips == 1) {  
      pipLine2 <- c("|   |")  
      pipLine3 <- c("| o |")  
      pipLine4 <- c("|   |")  
    }  
    if (pips == 2) {
```

```

    pipLine2 <- "| o|"
    pipLine3 <- "| |"
    pipLine4 <- "|o |"
    swpTmp <- pipLine2
    if (rot %% 2 == 1) {
        pipLine2 <- pipLine4
        pipLine4 <- swpTmp
    }
}
if (pips == 3) {
    pipLine2 <- c("| o|")
    pipLine3 <- c("| o |")
    pipLine4 <- c("|o |")
    swpTmp <- pipLine2
    if (rot %% 2 == 1) {
        pipLine2 <- pipLine4
        pipLine4 <- swpTmp
    }
}
if (pips == 4) {
    pipLine2 <- "|o o|"
    pipLine3 <- "| |"
    pipLine4 <- pipLine2
}
if (pips == 5) {
    pipLine2 <- "|o o|"
    pipLine3 <- "| o |"
    pipLine4 <- pipLine2
}
if (pips == 6) {
    pipLine2 <- "|ooo|"
    pipLine3 <- "| |"
    pipLine4 <- pipLine2
    if (rot %% 2 == 1) {
        pipLine2 <- c("|o o|")
        pipLine3 <- pipLine2
        pipLine4 <- pipLine2
    }
}
print(pipLineTopBot)
print(pipLine2)
print(pipLine3)
print(pipLine4)
print(pipLineTopBot)
}

```

```

isValidDominoFace <-
function(top_pips, bot_pips, top_rot, bot_rot) {
    if (top_pips <= bot_pips) {
        if (!top_rot && !bot_rot) {
            return(TRUE)
        }
    }
}

```

```

    if (top_pips == 1 || top_pips == 4 || top_pips == 5) {
      if (bot_pips == 1 || bot_pips == 4 || bot_pips == 5) {
        return(TRUE)
      }
    }
    return(FALSE)
  }
  return(FALSE)
}

extraccRw <- function(rw) {
  rwNmrc <- rw
  tmprFi <- rwNmrc
  tmprFi <- substring(tmprFi, nchar(rwNmrc) - 4, nchar(rwNmrc))
  tmprFiArr <- as.array(tmprFi)
  pastel <- ""
  for (j in 1:length(tmprFiArr)) {
    pastel <- paste0(pastel, tmprFiArr[j])
  }
  return(pastel)
}

genDmnoMtrx <- function(tp_pips, bt_pips, tp_rot, bt_rot, rot_domino) {
  dtMtrxTp <- genPipsMtrx(tp_pips, tp_rot)
  dtMtrxBt <- genPipsMtrx(bt_pips, bt_rot)
  collatedMtrx <- rbind(dtMtrxTp, dtMtrxBt)
  if (rot_domino) {
    if (tp_pips == 3 || tp_pips == 2) {
      rw1Tmp <- dtMtrxTp[1,]
      dtMtrxTp[1,] <- dtMtrxTp[3,]
      dtMtrxTp[3,] <- rw1Tmp
    } else {
      dtMtrxTp <- t(dtMtrxTp)
    }
    if (bt_pips == 3 || bt_pips == 2) {
      rw1Tmp <- dtMtrxBt[1,]
      dtMtrxBt[1,] <- dtMtrxBt[3,]
      dtMtrxBt[3,] <- rw1Tmp
    } else {
      dtMtrxBt <- t(dtMtrxBt)
    }
    collatedMtrx <- cbind(dtMtrxTp, dtMtrxBt)
  }
  return(collatedMtrx)
}

dispHrzntldmno <- function(LHS_pips, RHS_pips, LHS_rot, RHS_rot) {
  tpLn <- " ,---,---,"
  if (LHS_pips == 2) {
    fstPtFstLn <- " |'  |"
    fstPtThrdLn <- " |__'_|"
    if (LHS_rot) {

```

```

    fstPtFstLn <- " | ' |"
    fstPtThrdLn <- " | ' _ _ |"
  }
} else if (LHS_pips == 1) {
  fstPtFstLn <- " | . |"
  fstPtThrdLn <- " | _ _ _ |"
} else if (LHS_pips == 3) {
  fstPtFstLn <- " | ' . |"
  fstPtThrdLn <- " | _ _ ' |"
  if (LHS_rot) {
    fstPtFstLn <- " | . ' |"
    fstPtThrdLn <- " | _ ' _ |"
  }
} else if (LHS_pips == 4) {
  fstPtFstLn <- " | ' ' ' |"
  fstPtThrdLn <- " | ' ' _ |"
} else if (LHS_pips == 5) {
  fstPtFstLn <- " | ' ' . |"
  fstPtThrdLn <- " | ' ' _ |"
} else if (LHS_pips == 6) {
  fstPtFstLn <- " | ; ; |"
  fstPtThrdLn <- " | ` ` _ |"
  if (LHS_rot) {
    fstPtFstLn <- " | ' ' ' |"
    fstPtThrdLn <- " | ' ' _ |"
  }
} else if (LHS_pips == 0) {
  fstPtFstLn <- " | | |"
  fstPtThrdLn <- " | _ _ _ |"
}
if (RHS_pips == 2) {
  sndPtFstLn <- " ' ' |"
  sndPtThrdLn <- " _ _ ' |"
  if (RHS_rot) {
    sndPtFstLn <- " ' ' |"
    sndPtThrdLn <- " _ ' _ |"
  }
} else if (RHS_pips == 1) {
  sndPtFstLn <- " ' . |"
  sndPtThrdLn <- " _ _ _ |"
} else if (RHS_pips == 3) {
  sndPtFstLn <- " ' ' . |"
  sndPtThrdLn <- " _ _ ' |"
  if (RHS_rot) {
    sndPtFstLn <- " ' . ' |"
    sndPtThrdLn <- " _ ' _ |"
  }
} else if (RHS_pips == 4) {
  sndPtFstLn <- " ' ' ' |"
  sndPtThrdLn <- " ' ' _ |"
} else if (RHS_pips == 5) {
  sndPtFstLn <- " ' ' . |"
  sndPtThrdLn <- " ' ' _ |"
}

```

```

} else if (RHS_pips == 6) {
  sndPtFstLn <- " ; ; | "
  sndPtThrdLn <- " ` ` _ | "
  if (RHS_rot) {
    sndPtFstLn <- " ' ' ' | "
    sndPtThrdLn <- " ' ' ' _ | "
  }
} else if (RHS_pips == 0) {
  sndPtFstLn <- " | "
  sndPtThrdLn <- " _ _ _ | "
}
flFstRw <- paste0(fstPtFstLn, sndPtFstLn)
flThrdRw <- paste0(fstPtThrdLn, sndPtThrdLn)
print(tpLn)
print(flFstRw)
print(flThrdRw)
}

valids <- 0
cntr <- 0
for (i in 1:6) {
  for (l in 0:3) {
    for (j in 1:6) {
      for (k in 0:3) {
        isIthJthValidN <- isValidDominoFace(i, j, l %% 2, k %% 2)
        if (isIthJthValidN) {
          valids <- valids + 1
        }
        cntr <- cntr + 1
      }
    }
  }
}

probOfValidDomino <- valids / cntr

```

The probability of rolling a valid domino tile is 0.2708333 or $\frac{156}{576}$.

```

## [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] "|____|__'|"
## [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] "|__'|____|"
## [1] ",----,----,"
## [1] "|'.' | . |"
## [1] "|__'|____|"
## [1] ",----,----,"

```

[illegible]

```

## [1] "|'. ' | ; ; |"
## [1] "|'_ _|` _|"
## [1] ",-----,-----,"
## [1] "|; ; |    |"
## [1] "|` _ _|____|"
## [1] ",-----,-----,"
## [1] "|; ; | . |"
## [1] "|` _ _|____|"
## [1] ",-----,-----,"
## [1] "|; ; |' |"
## [1] "|` _ _|__ _|"
## [1] ",-----,-----,"
## [1] "|; ; |'. |"
## [1] "|` _ _|__ _|"
## [1] ",-----,-----,"
## [1] "|; ; |' ' |"
## [1] "|` _ _|' _ _|"
## [1] ",-----,-----,"
## [1] "|; ; |'. ' |"
## [1] "|` _ _|' _ _|"
## [1] ",-----,-----,"
## [1] "|; ; |; ; |"
## [1] "|` _ _|` _ _|"

```