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Class:	T. Y. B.Tech (Computer Engineering)
Course:	Processor Organization and Architecture (POA)
Course Code:	DJ19CEL502
Experiment No.:	04

AIM: Memory allocation techniques like first fit, best fit, worst fit and next fit.

FIRST FIT:

CODE:

```
def firstFit(blockSize, m, processSize, n):
        allocation = [-1] * n
        for i in range(n):
                for j in range(m):
                        if blockSize[j] >= processSize[i]:
                                allocation[i] = j
                                blockSize[j] -= processSize[i]
                                break

        print(" Process No. Process Size   Block no.")
        for i in range(n):
                print(" ", i + 1, "             ", processSize[i],
                                                "                    ", end = " ")
                if allocation[i] != -1:
                        print(allocation[i] + 1)
                else:
                        print("Not Allocated")

if __name__ == '__main__':
        blockSize = [100, 500, 200, 300, 600]
        processSize = [212, 417, 112, 426]
        m = len(blockSize)
        n = len(processSize)

        firstFit(blockSize, m, processSize, n)
```

OUTPUT:

```
PS C:\Users\Jadhav\Documents\BTech\Docs\5th Sem\POA\Prac\CODE> & C:/msys64/mingw64/bin/python.exe "
c:/Users/Jadhav/Documents/BTech/Docs/5th Sem/POA/Prac/CODE/firstFit.py"
 Process No. Process Size        Block no.
  1              212              2
  2              417              5
  3              112              2
  4              426              Not Allocated
PS C:\Users\Jadhav\Documents\BTech\Docs\5th Sem\POA\Prac\CODE>
```

BEST FIT:

CODE:

```
def bestFit(blockSize, m, processSize, n):
        allocation = [-1] * n
        for i in range(n):
                bestIdx = -1
                for j in range(m):
                        if blockSize[j] >= processSize[i]:
                                if bestIdx == -1:
                                        bestIdx = j
                                elif blockSize[bestIdx] > blockSize[j]:
                                        bestIdx = j
                if bestIdx != -1:

                        allocation[i] = bestIdx

                        blockSize[bestIdx] -= processSize[i]

        print("Process No. Process Size    Block no.")
        for i in range(n):
                print(i + 1, "                 ", processSize[i],
                                                                end = "               ")
                if allocation[i] != -1:
                        print(allocation[i] + 1)
                else:
                        print("Not Allocated")
# Driver code
if __name__ == '__main__':
        blockSize = [100, 500, 200, 300, 600]
        processSize = [212, 417, 112, 426]
        m = len(blockSize)
        n = len(processSize)
        bestFit(blockSize, m, processSize, n)
```

OUTPUT:

```
PS C:\Users\Jadhav\Documents\BTech\Docs\5th Sem\POA\Prac\CODE> & C:/msys64/mingw64/bin/python.exe "
c:/Users/Jadhav/Documents/BTech/Docs/5th Sem/POA/Prac/CODE/best.py"
Process No. Process Size        Block no.
1               212             4
2               417             2
3               112             3
4               426             5
PS C:\Users\Jadhav\Documents\BTech\Docs\5th Sem\POA\Prac\CODE>
```

WORST FIT:

CODE:

```
def worstFit(blockSize, m, processSize, n):
        allocation = [-1] * n
        for i in range(n):
                wstIdx = -1
                for j in range(m):
                        if blockSize[j] >= processSize[i]:
                                if wstIdx == -1:
                                        wstIdx = j
                                elif blockSize[wstIdx] < blockSize[j]:
                                        wstIdx = j
                if wstIdx != -1:
                        allocation[i] = wstIdx
                        blockSize[wstIdx] -= processSize[i]

        print("Process No. Process Size Block no.")
        for i in range(n):
                print(i + 1, "                 ",
                        processSize[i], end = "     ")
                if allocation[i] != -1:
                        print(allocation[i] + 1)
                else:
                        print("Not Allocated")
if __name__ == '__main__':
        blockSize = [100, 500, 200, 300, 600]
        processSize = [212, 417, 112, 426]
        m = len(blockSize)
        n = len(processSize)
        worstFit(blockSize, m, processSize, n)
```

OUTPUT:

```
PS C:\Users\Jadhav\Documents\BTech\Docs\5th Sem\POA\Prac\CODE> & C:/msys64/mingw64/bin/python.exe "
c:/Users/Jadhav/Documents/BTech/Docs/5th Sem/POA/Prac/CODE/worst.py"
Process No. Process Size Block no.
1                212     5
2                417     2
3                112     5
4                426     Not Allocated
PS C:\Users\Jadhav\Documents\BTech\Docs\5th Sem\POA\Prac\CODE>
```

NEXT FIT:

CODE:

```
def NextFit(blockSize, m, processSize, n):
        allocation = [-1] * n
        j = 0
        t = m-1
        for i in range(n):
                while j < m:
                        if blockSize[j] >= processSize[i]:
                                allocation[i] = j
                                blockSize[j] -= processSize[i]
                                t = (j - 1) % m
                                break
                        if t == j:
                                t = (j - 1) % m
                                break
                        j = (j + 1) % m

        print("Process No. Process Size Block no.")

        for i in range(n):
                print("\t", i + 1, "\t\t\t", processSize[i],end = "\t\t\t")
                if allocation[i] != -1:
                        print(allocation[i] + 1)
                else:
                        print("Not Allocated")

if __name__ == '__main__':
        blockSize = [5, 10, 20]
        processSize = [10, 20, 5]
        m = len(blockSize)
        n = len(processSize)

        NextFit(blockSize, m, processSize, n)
```

OUTPUT:

```
PS C:\Users\Jadhav\Documents\BTech\Docs\5th Sem\POA\Prac\CODE> & C:/msys64/mingw64/bin/python.exe "
c:/Users/Jadhav/Documents/BTech/Docs/5th Sem/POA/Prac/CODE/next.py"
Process No. Process Size Block no.
         1                       10                      2
         2                       20                      3
         3                       5                       1
PS C:\Users\Jadhav\Documents\BTech\Docs\5th Sem\POA\Prac\CODE>
```