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CHENNAI

SWE3001 – Operating Systems Laboratory Manual

Lab - 08

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SWE3001 – Operating Systems

Lab – 08– Memory Management

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1. **Design a C Code to allocate the best fit memory management in an operating system.**

```
#include <stdio.h>

void main()
{
   int fragment[20], b[20], p[20], i, j, nb, np, temp, lowest = 9999;
   static int barray[20], parray[20];
   printf("\n\t\t\t\tMemory Management Scheme - Best Fit");
   printf("\nEnter the number of blocks:");
   scanf("%d", &nb);
   printf("Enter the number of processes:");
   scanf("%d", &np);
   printf("\nEnter the size of the blocks:-\n");
   for (i = 1; i <= nb; i++)
   {
      printf("Block no.%d:", i);
      scanf("%d", &b[i]);
   }
   printf("\nEnter the size of the processes :-\n");
   for (i = 1; i <= np; i++)
   {
      printf("Process no.%d:", i);
      scanf("%d", &p[i]);
   }
   for (i = 1; i <= np; i++)
   {
      for (j = 1; j <= nb; j++)
      {
         if (barray[j] != 1)
         {
            temp = b[j] - p[i];
            if (temp >= 0)
               if (lowest > temp)
               {
```

```
                parray[i] = j;
                lowest = temp;
            }
        }
    }
    fragment[i] = lowest;
    barray[parray[i]] = 1;
    lowest = 10000;
  }
  printf("\nProcess_no\tProcess_size\tBlock_no\tBlock_size\tFragment");
  for (i = 1; i <= np && parray[i] != 0; i++)
    printf("\n%d\t\t%d\t\t%d\t\t%d\t\t%d", i, p[i], parray[i], b[parray[i]], fragment[i]);
}
```

Output :

```
samprincefranklin@Sams-MacBook-Air Lab % ./bestfit

                        Memory Management Scheme - Best Fit
Enter the number of blocks:5
Enter the number of processes:4

Enter the size of the blocks:-
Block no.1:100
Block no.2:500
Block no.3:200
Block no.4:300
Block no.5:600

Enter the size of the processes :-
Process no.1:212
Process no.2:417
Process no.3:112
Process no.4:426

Process_no      Process_size    Block_no        Block_size      Fragment
1               212             4               300             88
2               417             2               500             83
3               112             3               200             88
4               426             5               600             174
samprincefranklin@Sams-MacBook-Air Lab %
```

2. Design a C Code to allocate the first fit memory management in an operating system.

```
3.  #include <stdio.h>
4.
5.  void main()
6.  {
7.      int bsize[10], psize[10], bno, pno, flags[10], allocation[10], i, j;
8.
9.      for (i = 0; i < 10; i++)
10.     {
11.         flags[i] = 0;
```

```
        allocation[i] = -1;
    }
    printf("Enter no. of blocks: ");
    scanf("%d", &bno);
    printf("\nEnter size of each block: ");
    for (i = 0; i < bno; i++)
        scanf("%d", &bsize[i]);

    printf("\nEnter no. of processes: ");
    scanf("%d", &pno);
    printf("\nEnter size of each process: ");
    for (i = 0; i < pno; i++)
        scanf("%d", &psize[i]);
    for (i = 0; i < pno; i++) // allocation as per first fit
        for (j = 0; j < bno; j++)
            if (flags[j] == 0 && bsize[j] >= psize[i])
            {
                allocation[j] = i;
                flags[j] = 1;
                break;
            }
    // display allocation details
    printf("\nBlock no.\tsize\t\tprocess no.\t\tsize");
    for (i = 0; i < bno; i++)
    {
        printf("\n%d\t\t%d\t\t", i + 1, bsize[i]);
        if (flags[i] == 1)
            printf("%d\t\t\t%d", allocation[i] + 1, psize[allocation[i]]);
        else
            printf("Not allocated");
    }
}
```

Output :

```
samprincefranklin@Sams-MacBook-Air Lab % ./firstfit
Enter no. of blocks: 5

Enter size of each block: 100
500
200
300
600

Enter no. of processes: 4

Enter size of each process: 212
417
112
426

Block no.       size            process no.             size
1               100             Not allocated
2               500             1                       212
3               200             3                       112
4               300             Not allocated
5               600             2                       417
```

3. Design a C Code to allocate the worst fit memory management in an operating system.

```c
#include <stdio.h>
//#include <conio.h>
#define max 25
void main()
{
   int frag[max], b[max], f[max], i, j, nb, nf, temp;
   static int bf[max], ff[max];

   printf("\n\tMemory Management Scheme - Worst Fit");
   printf("\nEnter the number of blocks:");
   scanf("%d", &nb);
   printf("Enter the number of files:");
   scanf("%d", &nf);
   printf("\nEnter the size of the blocks:-\n");
   for (i = 1; i <= nb; i++)
   {
      printf("Block %d:", i);
      scanf("%d", &b[i]);
   }
   printf("Enter the size of the files :-\n");
   for (i = 1; i <= nf; i++)
   {
      printf("File %d:", i);
      scanf("%d", &f[i]);
   }
   for (i = 1; i <= nf; i++)
```

```
  {
    for (j = 1; j <= nb; j++)
    {
      if (bf[j] != 1)
      {
        temp = b[j] - f[i];
        if (temp >= 0)
        {
          ff[i] = j;
          break;
        }
      }
    }
    frag[i] = temp;
    bf[ff[i]] = 1;
  }
  printf("\nFile_no:\tFile_size :\tBlock_no:\tBlock_size:\tFragement");
  for (i = 1; i <= nf; i++)
    printf("\n%d\t\t%d\t\t%d\t\t%d\t\t%d", i, f[i], ff[i], b[ff[i]], frag[i]);

}
```

Output :

```
Enter the number of blocks:5
Enter the number of files:4

Enter the size of the blocks:-
Block 1:100
Block 2:500
Block 3:200
Block 4:300
Block 5:600
Enter the size of the files :-
File 1:212
File 2:417
File 3:112
File 4:426

File_no:        File_size :     Block_no:       Block_size:     Fragement
1               212             2               500             288
2               417             5               600             183
3               112             3               200             88
4               426             0               1               -126
```