Operating Systems (CT-353) Lab 09:

Name: Ajiya Anwar

Roll No. : DT-22006

<u>CODE:</u>

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#include <stdio.h>
int main() {
   int p[10], np, b[10], nb, ch, c[10], d[10], alloc[10], flag[10], i, j;
   for(i = 0; i < 10; i++) {
      flag[i] = 1;  // Process not allocated
      alloc[i] = -1;  // Block not allocated
   }
   printf("\nEnter the number of processes: ");
   scanf("%d", &np);
   printf("\nEnter the number of blocks: ");
   scanf("%d", &nb);
   printf("\nEnter the size of each process:\n");
   for(i = 0; i < np; i++) {
      printf("Process %d: ", i);
      scanf("%d", &p[i]);
   }
   printf("\nEnter the block sizes:\n");
   for(j = 0; j < nb; j++) {
      printf("Block %d: ", j);
      scanf("%d", &b[j]);
      c[j] = b[j];  // Create a copy for Best Fit
      d[j] = b[j];  // Create a copy for Worst Fit
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}
if(np <= nb) {
    printf("\n1. First Fit\n2. Best Fit\n3. Worst Fit\n");
    do {
        printf("\nEnter your choice: ");
        scanf("%d", &ch);
        switch(ch) {
            case 1:  // First Fit
                printf("\nFirst Fit\n");
                for(i = 0; i < np; i++) {
                    for(j = 0; j < nb; j++) {
                        if(p[i] <= b[j]) {
                            alloc[j] = p[i];
                            printf("\nProcess %d of size %d is allocated in block %d of size %d", i, p[i], j, b[j]);
                            flag[i] = 0;
                            b[j] = 0;  // Block is now full
                            break;
                        }
                    }
                    if(flag[i] == 1) {
                        printf("\nProcess %d of size %d is not allocated", i, p[i]);
                    }
                }
                Break;
            case 2:  // Best Fit
                printf("\nBest Fit\n");
                for(i = 0; i < nb; i++) {
                    for(j = i + 1; j < nb; j++) {
                        if(c[i] > c[j]) {
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                int temp = c[i];
                c[i] = c[j];
                c[j] = temp;
            }
        }
    }
    printf("\nAfter sorting block sizes:\n");
    for(i = 0; i < nb; i++) {
        printf("Block %d: %d\n", i, c[i]);
    }
    for(i = 0; i < np; i++) {
        for(j = 0; j < nb; j++) {
            if(p[i] <= c[j]) {
                alloc[j] = p[i];
                printf("\nProcess %d of size %d is allocated in block %d of size %d", i, p[i], j, c[j]);
                flag[i] = 0;
                c[j] = 0;  // Block is now full
                break;
            }
        }
        if(flag[i] == 1) {
            printf("\nProcess %d of size %d is not allocated", i, p[i]);
        }
    }
    Break;
case 3:  // Worst Fit
    printf("\nWorst Fit\n");
    for(i = 0; i < nb; i++) {
        for(j = i + 1; j < nb; j++) {
                if(d[i] < d[j]) {
                    int temp = d[i];
                    d[i] = d[j];
                    d[j] = temp;
                }
            }
        }
        printf("\nAfter sorting block sizes:\n");
        for(i = 0; i < nb; i++) {
            printf("Block %d: %d\n", i, d[i]);
        }
        for(i = 0; i < np; i++) {
            for(j = 0; j < nb; j++) {
                if(p[i] <= d[j]) {
                    alloc[j] = p[i];
                    printf("\nProcess %d of size %d is allocated in block %d of size %d", i, p[i], j, d[j]);
                    flag[i] = 0;
                    d[j] = 0;  // Block is now full
                    break;
                }
            }
            if(flag[i] == 1) {
                printf("\nProcess %d of size %d is not allocated", i, p[i]);
            }
        }
        break;
    default:
        printf("Invalid Choice...\n");
}
```

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        } while(ch <= 3);
    } else {
        printf("\nNumber of processes cannot be greater than the number of blocks.\n");
    }
    return 0;
}
```
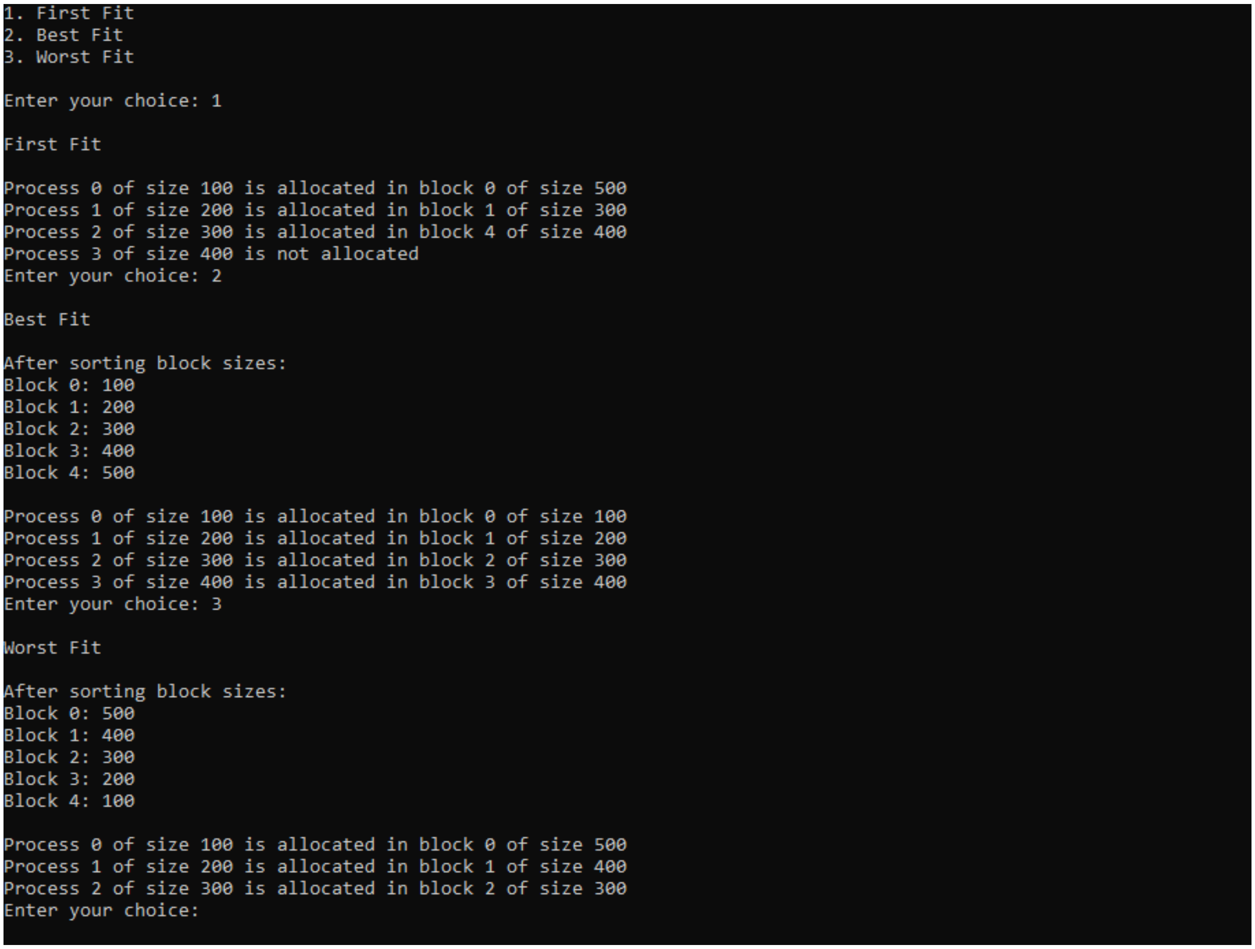

OUTPUT:



```
1. First Fit
2. Best Fit
3. Worst Fit

Enter your choice: 1

First Fit

Process 0 of size 100 is allocated in block 0 of size 500
Process 1 of size 200 is allocated in block 1 of size 300
Process 2 of size 300 is allocated in block 4 of size 400
Process 3 of size 400 is not allocated
Enter your choice: 2

Best Fit

After sorting block sizes:
Block 0: 100
Block 1: 200
Block 2: 300
Block 3: 400
Block 4: 500

Process 0 of size 100 is allocated in block 0 of size 100
Process 1 of size 200 is allocated in block 1 of size 200
Process 2 of size 300 is allocated in block 2 of size 300
Process 3 of size 400 is allocated in block 3 of size 400
Enter your choice: 3

Worst Fit

After sorting block sizes:
Block 0: 500
Block 1: 400
Block 2: 300
Block 3: 200
Block 4: 100

Process 0 of size 100 is allocated in block 0 of size 500
Process 1 of size 200 is allocated in block 1 of size 400
Process 2 of size 300 is allocated in block 2 of size 300
Enter your choice:
```