

EX –9 DEADLOCK AVOIDANCE

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CLASS : CSE – A

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Program:

```
#include <stdio.h>
```

```
#include <stdbool.h>
```

```
#define P 5
```

```
#define R 3
```

```
int main() {
```

```
    int alloc[P][R] = {
```

```
        {0, 1, 0},
```

```
        {2, 0, 0},
```

```
        {3, 0, 2},
```

```
        {2, 1, 1},
```

```
        {0, 0, 2}
```

```
    };
```

```
    int max[P][R] = {
```

```
        {7, 5, 3},
```

```
        {3, 2, 2},
```

```
        {9, 0, 2},
```

```
        {2, 2, 2},
```

```
        {4, 3, 3}
```

```
};
```

```
int avail[R] = {3, 3, 2};
```

```
int need[P][R];
```

```
for (int i = 0; i < P; i++)
```

```
    for (int j = 0; j < R; j++)
```

```
        need[i][j] = max[i][j] - alloc[i][j];
```

```
bool finish[P] = {false};
```

```
int safeSeq[P];
```

```
int work[R];
```

```
for (int i = 0; i < R; i++)
```

```
    work[i] = avail[i];
```

```
int count = 0;
```

```
while (count < P) {
```

```
    bool found = false;
```

```
    for (int p = 0; p < P; p++) {
```

```
        if (!finish[p]) {
```

```
            int j;
```

```
            for (j = 0; j < R; j++)
```

```
                if (need[p][j] > work[j])
```

```
                    break;
```

```
            if (j == R) {
```

```
                for (int k = 0; k < R; k++)
```

```
                    work[k] += alloc[p][k];
```

```

        safeSeq[count++] = p;

        finish[p] = true;

        found = true;
    }

}

}

if (!found) {
    printf("System is not in a safe state.\n");
    return -1;
}

}

printf("The SAFE Sequence is: ");
for (int i = 0; i < P; i++)
    printf("P%d%s", safeSeq[i], (i == P - 1) ? "\n" : " -> ");

return 0;
}

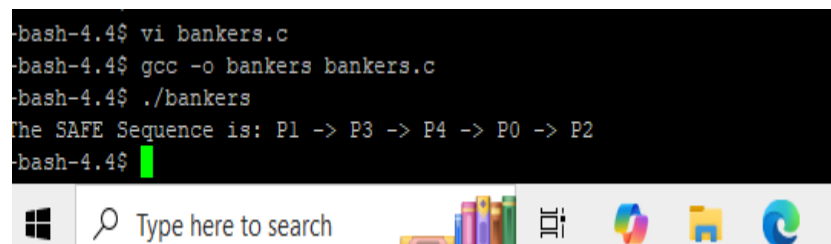
```

OUTPUT :

```

bash-4.4$ vi bankers.c
bash-4.4$ gcc -o bankers bankers.c
bash-4.4$ ./bankers
The SAFE Sequence is: P1 -> P3 -> P4 -> P0 -> P2
bash-4.4$

```



The screenshot shows a Windows 10 taskbar at the bottom with icons for the Start menu, search, task view, and several application windows. Above the taskbar is a terminal window with a black background and white text. The terminal shows the following commands and output:

```

bash-4.4$ vi bankers.c
bash-4.4$ gcc -o bankers bankers.c
bash-4.4$ ./bankers
The SAFE Sequence is: P1 -> P3 -> P4 -> P0 -> P2
bash-4.4$

```