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<b>Roll No:</b>	C2-27
<b>Practical No:</b>	2
<b>Aim:</b>	Write C programs to demonstrate various thread related concepts

**Source Code:**

```
#include <pthread.h>
#include <stdio.h>
#include <stdint.h>
#define NUM_THREADS 3
```

```
int je, jo, evensum = 0, sumn = 0, oddsum = 0, evenarr[50], oddarr[50];
```

```
void *Even(void *threadid) {
    int i, n;
    je = 0;
    n = (int)(uintptr_t)threadid;
    for (i = 1; i <= n; i++) {
        if (i % 2 == 0) {
            evenarr[je] = i;
            evensum = evensum + i;
            je++;
        }
    }
}
```

```
void *Odd(void *threadid) {
    int i, n;
```

```
    jo = 0;
    n = (int)(uintptr_t)threadid;
    for (i = 0; i <= n; i++) {
        if (i % 2 != 0) {
            oddarr[jo] = i;
            oddsum = oddsum + i;
            jo++;
        }
    }
}
```

```
void *SumN(void *threadid) {
    int i, n;
    n = (int)(uintptr_t)threadid;
    for (i = 1; i <= n; i++) {
```

```
sumn = sumn + i;
}
}

int main() {
pthread_t threads[NUM_THREADS];
int i, t;

printf("Enter a number: ");
scanf("%d", &t);

pthread_create(&threads[0], NULL, Even, (void *)(uintptr_t)t);
pthread_create(&threads[1], NULL, Odd, (void *)(uintptr_t)t);

pthread_create(&threads[2], NULL, SumN, (void *)(uintptr_t)t);

for (i = 0; i < NUM_THREADS; i++) {
pthread_join(threads[i], NULL);
}

printf("The sum of first N natural numbers is %d\n", sumn);
printf("The sum of first N even natural numbers is %d\n", evensum);
printf("The sum of first N odd natural numbers is %d\n", oddsum);

printf("The first N even natural numbers are:\n");
for (i = 0; i < je; i++) {
printf("%d\n", evenarr[i]);
}

printf("The first N odd natural numbers are:\n");
for (i = 0; i < jo; i++) {
printf("%d\n", oddarr[i]);
}

pthread_exit(NULL);
}
```

**OUTPUT:** (All the test cases are included):

```
(kali㉿kali)-[~/C27/lab_2]
$ vi lab2.c

(kali㉿kali)-[~/C27/lab_2]
$ gcc lab2.c

(kali㉿kali)-[~/C27/lab_2]
$ ./a.out
Enter a number: 12
The sum of first N natural numbers is 78
The sum of first N even natural numbers is 42
The sum of first N odd natural numbers is 36
The first N even natural numbers are:
2
4
6
8
10
12
The first N odd natural numbers are:
1
3
5
7
9
11
```

**Result:** Thus the program was executed and verified successfully.