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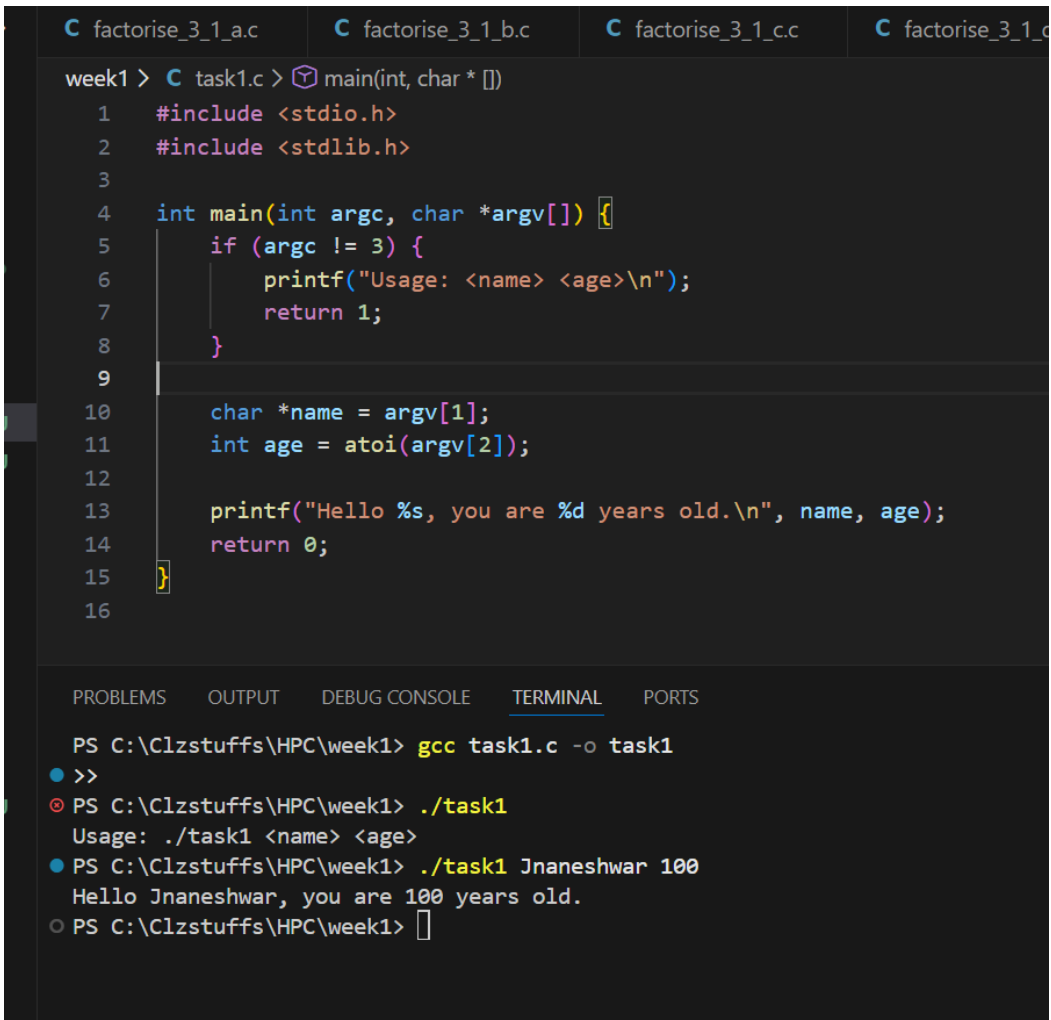
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6CS005 High Performance Computing Week 1 Workshop

Revision on C and Multithreading

Tasks – Basic C Syntax

1

1

```c
14  //      return 0;
15  // }
16  int main() {
17      char name[50];
18      int age;
19
20      printf("Enter your name: ");
21      scanf("%49s", name);
22
23      printf("Enter your age: ");
24      scanf("%d", &age);
25
26      printf("Hello %s, you are %d years old.\n", name, age);
27
28      return 0;
29  }
```

PROBLEMS   OUTPUT   DEBUG CONSOLE   TERMINAL   PORTS

```
PS C:\Clzstuffs\HPC\week1> ./task1
Enter your name: bobby
Enter your age: 22
Hello bobby, you are 22 years old.
PS C:\Clzstuffs\HPC\week1>
```

```c
//Qn3
#include <stdio.h>

int main() {
    for (int n = 1; n <= 100; n++) {
        if (n % 2 == 0 && n % 3 == 0 && n % 5 == 0)
            printf("BishBashBosh\n");
        else if (n % 2 == 0 && n % 3 == 0)
            printf("BishBash\n");
        else if (n % 2 == 0 && n % 5 == 0)
            printf("BishBosh\n");
        else if (n % 3 == 0 && n % 5 == 0)
            printf("BashBosh\n");
        else if (n % 2 == 0)
            printf("Bish\n");
        else if (n % 3 == 0)
            printf("Bash\n");
        else if (n % 5 == 0)
            printf("Bosh\n");
        else
            printf("%d\n", n);
    }
    return 0;
}
```

PROBLEMS   OUTPUT   DEBUG CONSOLE   TERMINAL   PORTS

```
PS C:\Clzstuffs\HPC\week1> ./task1
Bash
Bish
89
BishBashBosh
91
Bish
Bash
Bish
Bosh
BishBash
97
Bish
Bash
BishBosh
PS C:\Clzstuffs\HPC\week1>
```

3.

```c
//Q4
#include <stdio.h>

void swap(int *x, int *y) {
    int temp = *x;
    *x = *y;
    *y = temp;
}

int main() {
    int a = 3, b = 4;

    printf("a is %d and b is %d\n", a, b);
    swap(&a, &b);
    printf("a is now %d and b is now %d\n", a, b);

    return 0;
}
```

PROBLEMS   OUTPUT   DEBUG CONSOLE   TERMINAL   PORTS

```
S C:\Clzstuffs\HPC\week1> gcc task1.c -o task1
>
S C:\Clzstuffs\HPC\week1> ./task1
 is 3 and b is 4
 is now 4 and b is now 3
S C:\Clzstuffs\HPC\week1>
```

4.

```c
73   //Qn5
74   #include <stdio.h>
75   #include <stdlib.h>
76
77   int main() {
78       int size;
79
80       printf("Enter a number between 1 and 50: ");
81       scanf("%d", &size);
82
83       if (size < 1 || size > 50) {
84           printf("Invalid size.\n");
85           return 1;
86       }
87
88       int *numbers = malloc(size * sizeof(int));
89       if (!numbers) {
90           printf("Memory allocation failed.\n");
91           return 1;
92       }
93
94       for (int i = 0; i < size; i++) {
95           numbers[i] = rand();
96           printf("%d is %d\n", i, numbers[i]);
97       }
98
99       free(numbers);
100      return 0;
101  }
102
103
```

PROBLEMS   OUTPUT   DEBUG CONSOLE   TERMINAL   PORTS

```
PS C:\Clzstuffs\HPC\week1> ./task1
29 is 19895
30 is 5447
31 is 21726
32 is 14771
33 is 11538
34 is 1869
35 is 19912
36 is 25667
37 is 26299
38 is 17035
39 is 9894
40 is 28703
41 is 23811
42 is 31322
43 is 30333
PS C:\Clzstuffs\HPC\week1>
```

5.

6.

```c
104    #include <stdio.h>
105    #include <stdlib.h>
106    #include <unistd.h>
107    #include <pthread.h>
108
109    void *threadFunc(void *arg) {
110        int id = *(int *)arg;
111
112        for (int i = 0; i < 10; i++) {
113            printf("Thread %d (ID %ld): i=%d\n", id, pthread_self(), i);
114            usleep(1000);
115        }
116
117        free(arg);
118        return NULL;
119    }
120
121    int main() {
122        int numThreads;
123
124        printf("Enter number of threads: ");
125        scanf("%d", &numThreads);
126
127        pthread_t *threads = malloc(numThreads * sizeof(pthread_t));
128
129        for (int i = 0; i < numThreads; i++) {
130            int *id = malloc(sizeof(int));
131            *id = i + 1;
132            pthread_create(&threads[i], NULL, threadFunc, id);
133        }
134
135        for (int i = 0; i < numThreads; i++) {
136            pthread_join(threads[i], NULL);
137        }
138
139        free(threads);
140        return 0;
141    }
142
```

PROBLEMS   OUTPUT   DEBUG CONSOLE   TERMINAL   PORTS

```
Thread 1 (ID 1): i=8
Thread 3 (ID 3): i=8
Thread 2 (ID 2): i=8
Thread 1 (ID 1): i=9
Thread 2 (ID 2): i=9
Thread 3 (ID 3): i=9
PS C:\Clzstuffs\HPC\week1> 
```