Assignment #2 - Selection and Repetition

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ELEC2850 Microcontrollers Using C Programming

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1 Q1 Code

```c
#include <stdio.h>

int main(){
    int hours, minutes = 0;
    printf("Enter your time as HH:MM in 24-hour format: ");
    scanf("%d:%d", &hours, &minutes);
    if (hours < 0 || hours > 23 || minutes < 0 || minutes > 59){
        printf("Invalid time\n");
    }
    else if (hours < 6){
        printf("Toll at %d:%d is $1.55", hours, minutes);
    }
    else if (hours < 10){
        printf("Toll at %d:%d is $4.65", hours, minutes);
    }
    else if (hours < 18){
        printf("Toll at %d:%d is $2.35", hours, minutes);
    }
    else{
        printf("Toll at %d:%d is $1.55", hours, minutes);
    }
    return 0;
}
```

```
Enter your time as HH:MM in 24-hour format: 9:30
Toll at 9:30 is $4.65
```

Figure 1: Output for test case 9:30

```
Enter your time as HH:MM in 24-hour format: 14:20
Toll at 14:20 is $2.35
```

Figure 2: Output for test case 14:20

2 Q2 Code

```c
#include <stdio.h>

int main()
{
    int change = 0;
    printf("Enter the amount of change in cents: ");
    scanf("%d", &change);

    if (change < 0)
    {
        printf("Invalid amount\n");
    }
    else if (change == 0)
    {
        printf("No change");
    }
    if (change > 25)
    {
        printf("Number of quarters: %d\n", change / 25);
        change = change % 25;
    }
    if (change >= 10)
    {
        printf("Number of dimes: %d\n", change / 10);
        change = change % 10;
    }
    if (change >= 5)
    {
        printf("Number of nickels: %d\n", change / 5);
        change = change % 5;
    }
    if (change > 0)
    {
        printf("Number of pennies: %d\n", change);
    }
    return 0;
}
```

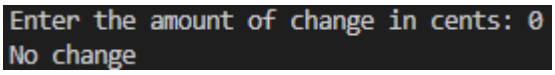

Figure 3: Output for test case 0

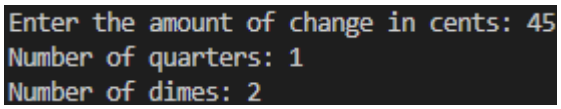

Figure 4: Output for test case 45

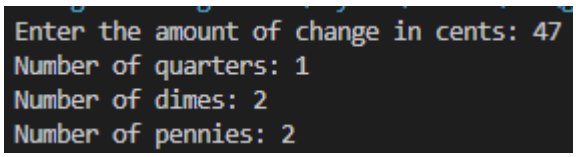

Figure 5: Output for test case 47

3 Q3 Code

```c
#include <stdio.h>

int main()
{
    int num = 0;
    printf("Enter a positive integer: ");
    scanf("%d", &num);
    if (num <= 0)
    {
        printf("Invalid number\n");
        return 0;
    }
    printf("Collatz Conjecture sequence is: %d, ", num);
    while (num != 1)
    {
        if (num % 2 == 0)
        {
            num = num / 2;
            if (num == 1)
            {
                printf("1.\n");
                break;
            }
            printf("%d, ", num);
        }
        else
        {
            num = 3 * num + 1;
            printf("%d, ", num);
        }
    }
    return 0;
}
```

```
Enter a positive integer: 8
Collatz Conjecture sequence is: 8, 4, 2, 1.
```

Figure 6: Output for test case 8

```
Enter a positive integer: 35
Collatz Conjecture sequence is: 35, 106, 53, 160, 80, 40, 20, 10, 5, 16, 8, 4, 2, 1.
```

Figure 7: Output for test case 35