

Supplementary Examination

Fundamentals of Computing and Programming Supplementary Midterm Exam

Time: 2 hours, Date: 11th October 2024

Total Marks: 20

Attempt all questions.

Question 1 (2+2+2+2+2 = 10 marks)

Part A

What is the output?

```
#include<stdio.h>

int main(void)
{
    int i, j, x = 0;
    for(i = 0; i < 4; i++)
    {
        for(j = 0; j < i; j++)
        {
            x += (i+j);
            printf("%d\n", x);
        }
    }
    printf("x = %d\n", x);
    return 0;
}
```

Part B

What is the output?

```
int main(void)
{
    int n = 10;
    printf("%d\n", f(n));
    return 0;
}

int f(int n)
{
    if (n > 0)
    {
        return (n + f(n-1));
    }
    else
    {
        return 0;
    }
}
```

Part C

What does this program do?

```
#include<stdio.h>

int main(void)
{
    int c, n, m;
    n = m = 0;
    while ((c = getchar()) != EOF)
    {
        if (c == '\n' || c == '\t' || c == ' ')
        {
            m = 0;
        }
        else if (m == 0)
        {
            m = 1;
            ++n;
        }
    }
    printf("%d\n", n);
}
```

Part D

What is the output?

```
#include<stdio.h>

int f(char s[])
{
    int i, n;
    n = 0;
    for (i = 0; s[i] >= '0' && s[i] <= '9'; ++i)
    {
        n = 10 * n + (s[i] - '0');
    }
    return n;
}

int main(void)
{
    printf("%d\n", f("59276481"));
    return 0;
}
```

Part E

What is the output?

```
#include <stdio.h>

char s[] = "monkey";

int main(void)
{
    int i, j, c;

    for (j = 0; s[j] != '\0'; j++);

    for (i = 0, j--; i < j; i++, j--)
    {
        c = s[i], s[i] = s[j], s[j] = c;
    }
    printf("%s\n", s);
    return 0;
}
```

Question 2 (5 + 5 = 10 marks)

Part A

Write a function `get_prime` that takes an integer `n` as argument and returns the n^{th} prime number. For example, `get_prime(1)` is 2, `get_prime(2)` is 3, `get_prime(3)` is 5 etc.

Part B

Write a C program to find the difference between the square of the sum of the first 100 positive integers and the sum of their squares.