

CSCI 2271 Computer Systems

Assignment 2: Pointers

Due Friday, February 1

PART A

What is the output of following programs? Briefly explain your answer.

1. Program 1:

```
# include <stdio.h>

void foo (int x)
{
    double a=100;
    double b=40;
    x =  a*a +4*b;

}

int main()
{
    int y = 20;
    foo (y);
    printf("%d", y);
    return 0;
}
```

2. Program 2:

```
# include <stdio.h>
void foo(int *ptr)
{
    double a=10;
    double b=4;
    *ptr =  a*a +4*b+5;

}

int main()
```

```

{
    int y = 20;
    foo(&y);
    printf("%d", y);

    return 0;
}

```

3. Program 3:

```

#include <stdio.h>

int main()
{
    double *ptr;
    double x;

    ptr = &x;
    *ptr = 10.254575;

    printf(" x = %0.2f\n", x);
    printf(" *ptr = %f\n", *ptr);

    *ptr += 10;
    printf(" x = %f\n", x);
    printf(" *ptr = %f\n", *ptr);

    (*ptr)++;
    printf(" x = %0.4f\n", x);
    printf(" *ptr = %0.4f\n", *ptr);

    return 0;
}

```

4. Program 4:

```

#include<stdio.h>
void foo(int *p, int *q)
{
    int a=10;
    int b=5;
    p = q;
    *p = b*b+10*a;
}
int i = 0, j = 1;
int main()
{

```

```

    foo(&i, &j);
    printf("%d %d \n", i, j);
    getchar();
    return 0;
}

```

5. Program 5:

```

#include<stdio.h>

void swap (char *x, char *y)
{
    char *t = x;
    x = y;
    y = t;
}

int main()
{
    char *x = "Computer Systems";
    char *y = "CSCI 2271";
    char *t;
    swap(x, y);
    printf("(%s, %s)\n", x, y);
    t = x;
    x = y;
    y = t;
    printf("(%s, %s)", x, y);
    return 0;
}

```

PART B

Write a program named **dollar.c** that asks the user to enter a U.S. dollar amount and then shows how to pay that amount using the smallest number of \$20, \$10, \$5, and \$1 bills:

```
gcc version 4.6.3
Enter a dollar amount: 93

$20 bills: 4
$10 bills: 1
$5 bills: 0
$1 bills: 3
█
```

Hint: Divide the amount by 20 to determine the number of \$20 bills needed, and then reduce the amount by the total value of the \$20 bills. Repeat for the other bill sizes. Be sure to use integer values throughout, not floating-point numbers.

PART C

Modify the program in PART B (name the new program **dollarMod.c**) so that it includes the following function:

```
void pay_amount(int dollars , int *twenties , int *tens ,
int *fives , int *ones);
```

When you are finished with three parts, submit your files dollar.c , dollarMod.c and a file containing your answers to the programs in PART A to Canvas.