

CS 1313 010 Spring 2018 Homework #4

Quiz to be held in class 9:30-9:45am Mon Feb 12 2018

1. WHAT is a *data type*?
2. GIVE THREE EXAMPLES of data types.
 - (a)
 - (b)
 - (c)
3. WHAT is a variable?
4. WHAT FOUR THINGS does every variable have?
 - (a)
 - (b)
 - (c)
 - (d)
5. For each of the above four things, WHO chooses it?
 - (a)
 - (b)
 - (c)
 - (d)
6. WHICH of the above four things does the statement below cause to be set?
`int x;`
7. WHICH of the above four things does the statement below cause to be set?
`float y = 22.7;`

8. **WHAT** is compile time?
9. **WHAT** is runtime?
10. **WHAT** is a declaration (also known as a declaration statement)?
11. If a variable is declared but not initialized, and it has not yet been given a value, then **WHAT VALUE** does it have?
12. Some compilers on some computers automatically initialize newly declared variables to default values. **UNDER WHAT CIRCUMSTANCES** should you explicitly initialize or assign a value to a variable, rather than letting the compiler initialize it to the default value?
13. **HOW MANY VALUES** does a variable have at any given moment in runtime? **BE VERY SPECIFIC.**
14. **HOW MANY VALUES** can a variable take on over the entire duration of a run?
15. **WHAT** is the declaration section of a program?
16. **WHERE** in a program is the declaration section?
17. **WHAT IS THE NAME** of the other section of a program?
18. **WHERE** in a program is that other section?
19. **NAME** three ways to set the value of a variable.
 - (a)
 - (b)
 - (c)

20. **WHAT** does an assignment statement do?
21. **GIVE AN EXAMPLE** of an assignment statement.
22. Is an assignment an **ACTION** or an **EQUATION**?
23. In an assignment, **ON WHICH SIDE OF THE SINGLE EQUALS SIGN** is the name of the variable whose value is being set?
24. In an assignment, **ON WHICH SIDE OF THE SINGLE EQUALS SIGN** is the value that the variable is being set to?
25. **WHAT** is an *initialization*?
26. **GIVE AN EXAMPLE** of an initialization statement.
27. For the initialization example above, **WHAT WOULD BE THE EQUIVALENT** if expressed as a declaration followed by an assignment?
28. In C, **WHICH CHARACTERS** can be in an **IDENTIFIER** such as a variable name?
29. In C, **WHICH CHARACTERS** can be at the **BEGINNING** of an **IDENTIFIER** such as a variable name?
30. **WHAT** is the *favorite professor rule*?
31. **MARK** valid C variable names **VALID** and invalid C variable names **INVALID**. For invalid C variable names, **EXPLAIN WHY** they are invalid. (Note that *valid* means acceptable to the compiler, rather than good programming practice.)
 - (a) `number_of_students_in_CS1313`
 - (b) `number of students in CS1313`
 - (c) `2_to_tango`
 - (d) `WHAZZAT`
 - (e) Huh?

32. For each of the following, **WRITE A DECLARATION STATEMENT** for a variable representing this quantity. For each, you should choose an appropriate data type. The name should comply with the “favorite professor” rule, and should also be a valid C identifier. **You DON’T need to initialize the variables.** Assume that `int` variables and `float` variables take 4 bytes (32 bits) each.
- (a) the number of students in CS1313
 - (b) your height in lightyears (a lightyear is the distance that light travels in a year, which is about 6 trillion miles).
 - (c) a spaceship’s speed in inches per century, approximated to three significant figures (assume that the spaceship travels at 99% of the speed of light)
 - (d) the number of books on a bookshelf
33. **WHAT** does a placeholder **DO?**
34. **WHAT IS THE PLACEHOLDER** for each of these data types?
- (a) `int`
 - (b) `float`
 - (c) `char`
35. When a user is inputting multiple values from the keyboard, **WHICH CHARACTERS** may they use to separate the values being input?

36. Compare `print` to `scanf`.

(a) Does it **OUTPUT** or **INPUT**?

`printf`:

`scanf`:

(b) **TO/FROM WHERE** does it output/input?

`printf`:

`scanf`:

(c) Its string literal **CAN** or **CANNOT** contain literal text (other than a single blank space as a separator between each set of multiple placeholders)?

`printf`:

`scanf`:

(d) Its string literal **CAN** or **CANNOT** contain a newline (for example, at the end of the string literal)?

`printf`:

`scanf`:

(e) The variable name(s) associated with placeholder(s) **MUST** or **CANNOT** be preceded by an ampersand (&)?

`printf`:

`scanf`:

37. **WHAT IS THE OUTPUT** of each of these programs? Examine the programs **CAREFULLY**.

You do not need to include extraneous blank spaces in your answer. If a program will not compile, mark **WON'T COMPILE** and **EXPLAIN**. If a program compiles and runs but does not produce any output, mark **NO OUTPUT** and **EXPLAIN**. If a program compiles and runs but produces garbage output, mark **GARBAGE** and **EXPLAIN**. If you are not confident of your answer, type in, compile and run the programs.

- (a)

```
#include <stdio.h>
int main ()
{ /* main */
    int woopeddoo;
    woopeddoo = 127;
    printf("%d\n", woopeddoo);
} /* main */
```
- (b)

```
#include <stdio.h>
int main ()
{ /* main */
    int yippee = 127;
    printf("yippee = %d\n", yippee);
} /* main */
```
- (c)

```
#include <stdio.h>
int main ()
{ /* main */
    int oyvey = 127;
    oyvey = 128;
    printf("oyvey = %d\n", oyvey);
} /* main */
```
- (d)

```
#include <stdio.h>
int main ()
{ /* main */
    int ladeedah;
    printf("%d\n", ladeedah);
} /* main */
```

38. **CHANGE THE ORDER** of the lines below so that the program outputs that the mass is 5.75 kilograms. You **MUST** use **EVERY SINGLE LINE SHOWN BELOW**.

```
    } /* main */
int main ()
    mass_in_kg = 10.5;
    printf("Mass: %f kg\n", mass_in_kg);
{ /* main */
    float mass_in_kg;
#include <stdio.h>
    mass_in_kg = 5.75;
```

39. **CHANGE THE ORDER** of the lines below so that the program outputs meaningful output. You **MUST** use **EVERY SINGLE LINE SHOWN BELOW**.

```
    printf("Let me guess your age!\n");
} /* main */
    scanf("%f", &age_in_years);
    printf("I'd guess that your age is %f years.\n",
{ /* main */
    printf("What is your age in years?\n");
int main ()
#include <stdio.h>
    float age_in_years;
    age_in_years);
```

If you use **ANY** resources other than Dr. Neeman, the TAs (Borah, Mirza, Narasimhan, Sadri, Zhu), the course textbook or the materials posted on the course webpage, you **MUST** reference them on the quiz. **THIS INCLUDES CLASSMATES, FRIENDS, PROFESSORS, ONLINE RESOURCES, ETC.**