Number representation: number bases

COSC 208, Introduction to Computer Systems, 2022-02-08

Announcements

- Tutors (Kate and Mia) hours: 6:30-8:30pm TW in McGregory 328
- Project 1 Part A due Thurs, Feb 17

Warm-up

Q1: *Write a function named* `abbreviate` *that takes a string and modifies the string in place to include only the first letter of each word. F or example,* `"Talk To You Later"` *is converted to* `TTYL`.

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Hex Conversion

Convert these hexadecimal numbers to decimal (i.e., base 10):

Q2: `0x9`

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Q3: `0xB`

```

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Q4: `0xF`

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Q5: `0x11`

Q6: `0x248`

🛑 Stop here after completing the warm-up; if you have extra time please **skip ahead** to the extra practice.

Binary <-> Hex Conversion

Convert these binary numbers to hexadecimal:

Q7: `0b1010`

Q8: `0b1111`

Q9: `0b11001100`

Q10: `0b11100111`

Convert these hexadecimal numbers to binary:

Q11: `0x5`

Q12: `0x8`

Q13: `0xB`

Q14: `0x37`

🛑 Stop here after completing the above conversions; if you have extra time please **skip ahead** to the extra practice.

Decimal -> Binary Conversion

Convert these decimal numbers to binary:

Q15: `10`

Q16: `15`

Q17: `42`

Q18: `192`

🛑 Stop here after completing the above conversions; if you have extra time please **skip ahead** to the extra practice.

Signed integers

Express these decimal numbers using 8-bit two's complement:

Q19: 13

Q20: −128

Q21: −64

Q22: −1

Q23: −13

Q24: 127

Please turn page

Extra practice

Convert these binary numbers to decimal:

QA: `0b1111`

QB: `0b10100`

QC: `0b101000`

Convert these hexadecimal numbers to decimal:

QD: `0xC`

QE: `0x18`

QF: `0x30`

QG: *Write a function called `check_password` that returns 1 if a password is at least 8 characters long and contains at least one uppercase letter, at least one lowercase letter, and at least one digit. Otherwise, the function returns 0. You may want to use the functions `isupper`, `islower`, and `isdigit`. They take a character as a parameter and return 1 if the character is an uppercase letter, lowercase letter, or digit, respectively; otherwise, they return 0.*